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# ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 2009

## HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

HOUSE OF REPRESENTATIVES

ONE HUNDRED TENTH CONGRESS

SECOND SESSION

SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT

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NOTE: Under Committee Rules, Mr. Obey, as Chairman of the Full Committee, and Mr. Lewis, as Ranking Minority Member of the Full Committee, are authorized to sit as Members of all Subcommittees.

DIXON BUTLER, TERRY TYBOROWSKI, TAUNJA BERQUAM, ROBERT SHERMAN, and LORI MAES, *Staff Assistants*

## PART 6

## DEPARTMENT OF ENERGY

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**Environmental Management and Legacy Management**.
**Science Research** .....
**Energy Supply and Conservation, Fossil Energy, Electricity Delivery and Energy Reliability** .....

Printed for the use of the Committee on Appropriations

# PART 6—ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR 2009

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U.S. GOVERNMENT PRINTING OFFICE

43–355 WASHINGTON : 2008

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# ENERGY AND WATER DEVELOPMENT, AND RELATED AGENCIES APPROPRIATIONS FOR 2009

THURSDAY, FEBRUARY 28, 2008.

## SECRETARY OF THE DEPARTMENT OF ENERGY

### WITNESS

**HON. SAMUEL BODMAN, SECRETARY OF ENERGY**

CHAIRMAN VISCLOSKY'S OPENING STATEMENT

Mr. VISCLOSKY [presiding]. I would like to bring the subcommittee to order.

Mr. Secretary, I thank you very much for being here. I understand that you have not been in the best of health, but we do appreciate the trouble you have gone to be here.

This is our third hearing of the year of the subcommittee, but the first dealing specifically with the Department of Energy that encompasses the majority of our jurisdiction. Given the interest in the hearing, I did want to take this opportunity, as I did yesterday, to welcome back Mr. Rehberg to the subcommittee. He is trying to introduce better health habits and dietary habits to us. [Laughter.]

I appreciate that, as well as Mr. Calvert, who has extensive experience and knowledge as far as water issues in particular, and is going to make a great contribution to the Committee. I again appreciate their being on the subcommittee.

But also, as everybody appreciates, the work of the subcommittee is certainly been driven by the staff. Unfortunately, our Clerk from last year, Dixon Butler, had a very serious illness and continues to recuperate, and Scott Burnison has also gone on to his next stepping stone in life, and we have some additional personnel changes. I just wanted to take a moment to highlight that, and then we can begin the hearing.

First of all, we have a detailee from the Department of Energy, Uday Varadarajan. Uday, if you would identify yourself? Uday is a detailee from DOE, originally from Berkeley, went to Princeton, got his Ph.D. from U.C. Berkeley. The title of his dissertation, which Mr. Simpson is also going to elaborate on a bit later, was Geometry Topology in String Theory.

So I just want to make sure we are clear on that.

The other detailee, and I almost hate those titles because they really are full-fledged members of our group and staff, is Lauren Minto, who grew up and is from the great state of Montana. As I like to kid Lauren, she majored in Latin because all of her degrees

are followed by summa and magna and cum laude and all of those types of words. She had the good sense to get two of her advanced degrees from the University of Indiana in Bloomington, Indiana. I don't know how she got this job.

Rob Blair is continuing his work with the Committee, but in an enhanced capacity. Rob served with the Committee last year, but also had a lot of duties on Foreign Operations, and essentially is here fulltime picking up the slack from Kevin Cook. Rob, it appears that if you work on the right end of this panel, you have to graduate from Cornell, and is a Cornell grad, and also have advanced degrees from the Fletcher School of Law and Diplomacy, and spent some time in the Peace Corps.

Also new to our staff is Bob Sherman. If Bob would identify himself? He is a graduate of Oberlin College, as well as UCONN, and has a great deal of congressional experience, with most of it on the authorizing side. Bob has seen the light and is new on the appropriations side. But very importantly for his work on weapons programs, he spent 8 years with the Arms Control and Disarmament Agency at the State Department.

Returning is Lori Maes, who is our administrative aide, from New Mexico, went to Texas Women's University, and has been with the full committee for 25 years, most of which she spent on the Foreign Operations Subcommittee.

Also returning is one of our leaders, Terry Tyborowski. She returns continuing to do an exceptional job as far as environmental management accounts and many of the other energy accounts. To show you how smart Terry is, she went to school at "the U," as some people would call it, the University of Miami, where it is much warmer than Cornell.

Also, before I introduce our leaders, we have a lot of associate staff here, and at one point that was my occupation in life, so I appreciate the contribution of all of the associate staff, two in particular. Colonel Kenny Kraft, who is the associate staff for Mr. Hobson, and Shari Davenport, who is my associate staff.

We also do have, if you would, our leadership and that is Kevin Cook, a Cornell grad, as I mentioned, formerly with the Corps, and previously served, as many of you know, as Clerk of the subcommittee. As I like to tell Kevin, he married really well in life.

And finally, the Clerk is Taunja Berguarn, who has multiple degrees from Portland State University, and has served on the subcommittee and also is, if you would, experienced as far as her career, with the Army Corps of Engineers, also having served our country in Iraq during 2004.

And very importantly, we don't know for sure, but it is our working assumption, is that in the old days, as I like to say, you had to be a former Marine to clerk an appropriations subcommittee, not that there is anything wrong with that, but it would appear that Taunja is the first woman to clerk the Energy and Water Subcommittee. You might want to give her a round of applause for that.

With that, I do have an opening statement, and then Mr. Secretary, we will proceed.

Secretary, thank you very much for appearing before the subcommittee today. Funding and oversight of the Department of En-

ergy constitutes roughly 80 percent of the responsibility of the Energy and Water Development Subcommittee. The scope of DOE activity is diverse and of critical importance.

Last year as the Chairman of this subcommittee, I outlined five themes that I view as high priority: Effective project management of the agency's programs, a smart investment in energy research development and technology, advancing national efforts on nuclear nonproliferation, transforming and reducing the nuclear weapons complex, and finally, addressing our national environmental cleanup responsibilities.

These issues have not lessened in importance in the intervening year. On the contrary, they have become more critical.

I would now add nuclear waste disposal to the list.

The department is ultimately an implementing organization, and not responsible for the promulgation of policy. However, this issue impacts the Department's budget and operations. More importantly, the issue has significant impacts to the national budget through judgment fund payments estimated as much as $35 billion.

An additional energy concern is gas prices, an issue impacting every American. Earlier this month, the subcommittee had an oversight hearing on the best options for reducing oil consumption and decreasing $CO_2$ emissions from the vehicle sector. In that hearing, we learned of several promising research opportunities that could lead to reduced reliance on oil.

Today's hearing is the first of seven this subcommittee will conduct this year on the Department of Energy's fiscal year 2009 budget request and current management challenges and approaches. I would like to establish at the outset that I am extremely troubled by the Department's administration of the fiscal year 2008 appropriations. The Department has repeatedly and cavalierly disregarded congressional direction on significant issues under its jurisdiction. The language contained in the Omnibus Appropriation Bill was clear, yet the department has repeatedly thwarted specific directions and the intent of Congress.

Mr. Secretary, when you came to the Department, you committed to reforming project management. Yet time and again, the Department comes to Congress with reports of significant cost increases and schedule slips. You now appear before us with what is presumably your last budget request, and there has been no significant change in the Department's approach to cost and schedule issues.

I also question the choices that the administration has made in the budget request. For example, the budget proposes the elimination of the Weatherization Program during a period of rising energy costs for those who are less fortunate. Yet NP–2010 is substantially above its baseline estimate. Nuclear Nonproliferation is reduced, while funding for nuclear weapons is increased.

Last year, you testified that meeting the Department's commitment for public health was among your highest priorities, yet this budget proposes to fund the Environmental Management account at a level that would not meet those commitments. President Bush proudly requests a huge increase for the Office of Science, and in the same document savages funding for Energy Efficiency and Renewable Energy programs by $467 million.

Now, I must tell you, Mr. Secretary, I am abjectly disappointed. I will be interested today in hearing your defense of the choices made in the Department's fiscal year 2009 budget request, fiscal year 2008 execution, and overall department management.

At this point, I would like to yield to Mr. Hobson for his opening statement.

Mr. HOBSON. Thank you, Mr. Chairman.

MR. HOBSON'S OPENING STATEMENT

Mr. Secretary, this is the third year where you are testifying before this subcommittee. As I have said before—is it four?

Secretary BODMAN. It seems like three.

Mr. HOBSON. It has gone by fast. [Laughter.]

I believe that Secretary Bodman is probably one of the best qualified secretaries that we have ever seen at the Department of Energy in a long time. However, I have to say that I am very disappointed that his technical expertise and management background have not led to the tangible improvements in the department that I had hoped for, and I think this committee hoped for.

The nuclear waste repository at Yucca Mountain is still on life support, and the department is ignoring the political realities in the Senate and the state of Nevada that can and will block any progress on the repository. The department refuses to look seriously at alternatives for dealing with spent fuel.

Meanwhile, spent fuel continues to accumulate at reactor sites around the country and a multi-billion dollar liability against the federal government grows larger every day. The department has fumbled attempts at recycling spent fuel under the global nuclear energy partnership, and have alienated even the strongest supporters for recycling spent fuel, and have done nothing to convert any of the skeptics.

In part because of the failure to provide real solutions for spent fuel, the department has also failed to move forward decisively on nuclear power. We absolutely will need more nuclear power plants to reduce our dependence on foreign oil, and reduce our greenhouse gas emissions. The department has not put the U.S. nuclear industry on a secure footing, in my opinion, for the future.

The massive waste treatment plant at Hanford continues to be behind schedule and the cost estimates are reliable only until the next management team takes over. I have seen that time and time again. But the department still believes that the waste treatment plant deserves $690 million every year, regardless of whether we have any project performance to show to the taxpayers.

In total, the department is requesting $25 billion for fiscal year 2009. Most people do not realize that we will spend $2 billion of that amount at the Hanford site. We will spend another $2 billion at Los Alamos—not one of my favorite places, because we can't get any performance judgments. I guess success is measured by how much we spend every year on certain projects in certain states, rather than what results are achieved.

Another place where the department made a bad deal for the taxpayers is the Savannah River site in South Carolina. The department wants to spend nearly $2.2 billion at Savannah River in 2009, with the centerpiece for waste spending being the MOX

plant. I recognize the political compromise that led the chairman to allow that project to move forward into construction, but that doesn't mean I have to like it or trust anything the department tells us about it, and I have a very pointed question later on that I am going to ask about what is happening down there and why you are continuing to do certain things in the design-build of that, when there is a very serious technical problem with that construction.

There are some bright spots at the department, and I am thinking especially of the success that Ray Orbach is achieving on the science front. I give Dr. Orbach credit for doing the best he can within the funding made available to him, for taking the long-range view of his programs, and for taking congressional guidance seriously. Unfortunately, the Office of Science is an exception, rather than the rule at DOE. If anything the DOE's motto seems to be ignore Congress's direction to the maximum extent.

It is an interesting strategy when DOE is before this subcommittee asking for over $25 billion in 2009. If we face fiscal constraints similar to what happened in 2008, where we had to work within the president's proposed spending levels for our bill, I personally would recommend we do the same thing we did last year, which is transfer at least $1 billion from DOE to the Corps of Engineers.

I would much rather give the taxpayers' hard-earned dollars to an agency that is beginning to understand and respond to project management, following congressional direction, and recognizes that its contractors work for the federal government, instead of the other way around.

Mr. Chairman, that concludes my statement.

Mr. VISCLOSKY. Okay, Mr. Hobson.

Mr. Secretary.

SECRETARY BODMAN'S OPENING STATEMENT

Secretary BODMAN. Mr. Chairman, Congressman Hobson, members of the subcommittee, thank you for giving me the opportunity of appearing before you for what is now the fourth time to discuss our department's budget request.

I think it is safe to say that the budget of 2009, that the goals of the budget of 2009 are largely unchanged from our budget goals in previous years. This budget request provides us, in my judgment, the resources that are needed to continue to move forward on our five central missions, which we count as promoting and enhancing energy security, nuclear security, scientific discovery, environmental responsibility, and management excellence.

Since 2001, this administration and Congress have invested more than $180 billion in the Department of Energy and its programs. These investments have been used to address the growing demand for affordable, clean and reliable energy; have helped safeguard our national security; and have enabled scientific research leading to significant improvements in the quality of life and the health of the American people.

The department's fiscal year 2009 request in the amount of $25 billion, as has been mentioned, was developed with the need to continue these activities in mind, and to address the energy challenges

that confront us daily. An investment of this size allows us to fulfill our central missions, as well as advance the goals of the president's American competitiveness initiative, to ensure U.S. technological competitiveness and economic security. It also allows us to continue our progress toward the goals of the president's advanced energy initiative, accelerating the research, development and deployment of clean alternative energy technology.

The Department of Energy is responsible for promoting America's energy security. We encourage the development of reliable, clean and affordable energy supplies, and we strengthen United States competitiveness by leading in innovation and scientific discovery. At the same time, we continue to ensure the security of the nuclear stockpile and we reclaim and restore the sites that are the nation's environmental legacy.

All of this is done under a rubric of sound management, consistent with the president's management agenda to improve performance and accountability. But this budget request also reflects our concerns about America's energy future. The projected growth in global energy demand is a major challenge for us all. It is a challenge that must be met with responsible action. Global demand will continue to grow. We cannot depend solely on hydrocarbons to meet it.

This is a problem for all nations, for energy producers and consumers alike. I believe, therefore, that it is vital that the United States pursue policies that enhance global energy security, not just our own. We need new energy options, cleaner and more efficient technologies, and alternative fuel. And we must support fully the research and innovation necessary for their development. We must diversify our energy supplies, diversify our energy suppliers, and establish and secure additional energy supply routes.

This budget document should also be viewed as a roadmap showing the future course of America's energy security. This course will not, in my judgment, be an easy one, but I believe it is a necessary one. These efforts will require a sustained commitment on the part of government, strong private sector investment, and strategic collaborations between government, the private sector, and the research community, including academia. Our goal is to foster continued economic growth and promote a sustainable energy future.

Mr. Chairman, I believe the committee has a copy of my written statement, which I now ask be included in the record, so that in the interests of time, we might move to any questions that you or other members of the committee may have about the department's budget request.

Thank you, sir.

[The prepared statement of Samuel W. Bodman, Secretary, U.S. Department of Energy, follows:]

**Statement of Samuel W. Bodman**
**Secretary of Energy**
**Before the**
**Subcommittee on Energy and Water Development, and Related Agencies**
**Committee on Appropriations**
**U.S. House of Representatives**
**February 28, 2008**

Mr. Chairman and members of the Committee, I am pleased to be before you today to present the President's fiscal year (FY) 2009 budget proposal for the Department of Energy. The strength and prosperity of America's economy is built on the security of our nation and the reliability of energy sources. Since 2001, the Administration has committed $183 billion through the Department of Energy (DOE) to help drive America's economic growth, provide for our national security, and address the energy challenges that face our nation. The Department of Energy's FY 2009 budget request of $25 billion stays on course to address the growing demand for affordable, clean and reliable energy; preserve our national security; and enable scientific breakthroughs that could have significant impacts on our quality of life and the health of the American people. The FY 2009 budget was developed to continue to meet these goals.

In FY 2009, the Department will advance the President's American Competitiveness Initiative aimed at ensuring U.S. technological competitiveness and economic security, and implement the Advanced Energy Initiative, to accelerate the research and development of clean energy technologies to diversify our nation's energy supply. These efforts, combined with investments to meet our commitment to protect the United States as stewards of our nation's nuclear weapons stockpile and to environmental cleanup, will foster continued economic growth and promote a sustainable energy future.

This budget, while focused on delivering results to meet the nation's priorities, also serves as the roadmap for the future of America's energy security. The FY 2009 budget request translates into investments that will:

- Expand research, development, and demonstration of cost-effective carbon capture and storage,
- Accelerate technological breakthroughs outlined in the Advanced Energy Initiative,
- Provide enhanced energy security through the expansion of the Strategic Petroleum Reserve,
- Continues to foster scientific leadership with the American Competitiveness Initiative,
- Advance environmental cleanup and nuclear waste management,
- Maintain the safety and reliability of the nuclear weapons stockpile and continue transforming the weapons complex, and
- Work with other countries to prevent the spread of weapons of mass destruction.

To highlight, in FY 2009 the Department of Energy continues to meet this vision and strengthen the framework built over the last eight years to ensure our national energy security and reliability. The FY 2009 budget request:

- **Invests in Climate Change Technologies**
  In support of the Administration's initiatives that support climate change technology and to implement the U.S. Climate Change Technology Program's Strategic Plan, the FY 2009 budget emphasizes a two-pronged strategy for its climate change technology programs: invest in carbon dioxide ($CO_2$) mitigation technologies for coal with carbon capture and storage (CCS) and in nuclear power, and invest in near-term, $CO_2$ mitigation technologies focused on improving energy efficiency. The budget provides $407 million to research and $241 million to demonstrate advanced coal technologies which is almost entirely focused on cost-effective CCS for coal-fired power plants. The Department also continues to help work with the Department of the Treasury to administer $1.65 billion in investment tax credits from the Energy Policy Act of 2005 that will accelerate commercial deployment of technologies that are central to carbon capture and storage.

  Through international collaboration, the United States strives to maintain a leadership role in promoting and deploying clean energy technology domestically and around the world. President Bush believes that the greatest progress will be assured by working together with other nations to advance the related objectives of improving economic and energy security, alleviating poverty, improving human health, reducing harmful air pollution, and reducing the growth of greenhouse gases. The United States, Australia, China, India, Japan, Canada, and South Korea work to implement the objectives of the **Asia-Pacific Partnership** (APP) on Clean Development and Climate. This Partnership is helping to advance the President's goal of developing and accelerating the deployment of cleaner and more efficient technologies and practices. It builds on existing multilateral climate initiatives including the Carbon Sequestration Leadership Forum, the International Partnership for a Hydrogen Economy, and Methane to Markets. In FY 2009, the Department is requesting $15.0 million, evenly divided between the Fossil Energy Program and the Energy Efficiency and Renewable Energy Program, to continue to support this important initiative.

- **Advances the American Competitiveness Initiative**
  In 2007, President Bush launched the American Competitiveness Initiative (ACI) to encourage innovation throughout the economy and to give America's children a firm foundation in math and science. A request of $4.7 billion in FY 2009, $748.8 million above the FY 2008 enacted level, will increase basic research in the physical sciences that will have broad impacts on future energy technologies and environmental solutions. ACI funding will support the construction and operation of world-class scientific facilities and will support literally thousands of scientists and students -- our current and future scientific and technical workforce. Scientific and technological discovery and innovation are the major engines of

increasing productivity -- indispensable to ensuring growth, job creation, and rising incomes for American families in the technologically driven twenty-first century. This investment is essential if the United States is to maintain its world-class, scientific leadership and global competitiveness.

- **Accelerates the Advanced Energy Initiative**
  At a request of $3.2 billion, $624 million above the FY 2008 enacted appropriations of $2.5 billion, the President's Advanced Energy Initiative (AEI) will continue to support clean energy technology breakthroughs that will help improve our energy security through diversification and help to reduce our dependence on oil. The FY 2009 budget for AEI includes funding to promote the licensing of new nuclear power plants and research on an advanced nuclear fuel cycle. Also, AEI's diverse energy portfolio includes investment in making solar power cost-competitive with conventional sources of electricity by 2015 and supports a robust vehicle technology program that includes developing lithium-ion batteries, plug-in hybrids, and drive-train electrification.

- **Expands the Resurgence of Nuclear Energy**
  Nuclear energy is an important source of energy in the United States and is a key component of the AEI portfolio. Nuclear energy is free of greenhouse gas (GHG) emissions, safe and reliable, and currently supplies about 20 percent of the nation's electricity. The Department is leading the Administration's efforts to spur a nuclear renaissance in the United States to meet energy and climate goals. We continue to work with industry partners to promote the near term licensing and deployment of the first new nuclear plants in over 30 years, as well as to extend the life of current plants. Furthermore, the Department is developing advanced nuclear fuel technologies that will maximize energy from nuclear fuel. These technologies will strengthen the nuclear nonproliferation regime and further support the expansion of nuclear power as a safe, efficient, and cost-effective source of energy capable of supporting continued economic growth in the 21st century. In FY 2009, a total of $1.4 billion is requested for nuclear energy activities including $487 million for the Mixed Oxide Fuel Fabrication Facility.

  It is critical to note that the growth of nuclear power is only possible if we continue to develop a responsible path for disposing of spent nuclear fuel. Therefore, $494.7 million is requested in FY 2009 for the continued development of the geologic waste repository at **Yucca Mountain**, Nevada, and to support the defense of the License Application that we will submit in 2008 to the Nuclear Regulatory Commission for authorization to construct the repository.

- **Transforms Our Nuclear Weapons Complex**
  The FY 2009 budget reconfirms the Department of Energy's steadfast commitment to the national security interests of the United States through stewardship of a reliable and responsive nuclear weapons stockpile and by advancing the goals of global non-proliferation. Through the National Nuclear

Security Administration (NNSA), the Department directs $6.6 billion in this request for **Weapons Activities**, a $320.6 million increase from the FY 2008 enacted appropriation, to meet the existing requirements for stewardship of the nation's nuclear weapon stockpile, technologies and facilities, as well as to continue to transform the nuclear weapons complex with the goal of a much smaller size by 2030. This transformation effort is structured to achieve President Bush's vision to create a more efficient and less expensive nuclear weapons complex of the future that is able to respond to changing national and global security challenges.

- **Reduces the Risk of Weapons of Mass Destruction (WMD) Worldwide**
  The Department has provided $1.8 billion in this request for detecting, securing, eliminating and disposing of dangerous nuclear materials around the world. The amount includes $1.2 billion within Defense Nuclear Nonproliferation, $487 million within the Office of Nuclear Energy, and $117 million funded in Weapons Activities. The Mixed Oxide (MOX) Fuel Fabrication Facility project remains a key activity of the nation's nuclear nonproliferation efforts. The FY 2009 request for MOX is $ 208.2 million more than the FY 2008 enacted appropriation reflecting continued support for this project. Further, the request provides significant out-year growth to fulfill our international agreements and accelerate our work to reduce the risk of (WMD) threats. Among many advances, the FY 2009 budget provides for the installation of radiation detection equipment at an additional 49 foreign sites in 14 countries and at 9 additional Megaports; continues to implement an aggressive, prioritized work schedule to complete all shipments of Russian origin spent highly-enriched uranium (HEU) fuel stored outside reactor cores by the end of 2010; and maintains a schedule allowing completion of the construction of the second of two fossil-fueled power plants located in Zheleznogorsk, Russia, in 2010. The Seversk project is scheduled for completion by the end of December 2008.

- **Meets Our Commitments to Public Health and Safety and the Environment**
  During my first days at the Department of Energy, I announced safety as my top priority and the number one operating principle of the Department. To implement my vision, I created a new **Office of Health, Safety and Security**. Ensuring the safety of workers across the DOE complex is my top priority and this new office will go a long way in strengthening our safety and security organization. We must be world class not only in how we carry out our mission, but in the safe, secure, and environmentally responsible way in which we manage operations at our facilities across the country. The organization's FY 2009 budget request of $446.9 million, builds on a number of actions the Department has taken over the past two years to increase safety of DOE workers.

  The FY 2009 budget includes $5.5 billion for the **Environmental Management** program to protect public health and safety by cleaning up hazardous, radioactive legacy waste left over from the Manhattan Project and the Cold War. This budget allows the program to continue to make progress towards cleaning up and closing

sites and focuses on activities with the greatest risk reduction. By the end of 2009, cleanup projects at Sandia National Laboratory and Argonne National Laboratory will be finished.

As the Department continues to make progress in completing clean-up, the FY 2009 budget request of $186 million for **Legacy Management** supports the Department's long-term stewardship responsibilities and payment of pensions and benefits for our former contractor workers after site closure.

In light of the increased number of sophisticated cyber attacks directed at all facets of our communities, from military to civilian to private users, the Department is taking significant steps to secure the virtual pathways and mitigate the threat from cyber intrusions. Implementing these steps will be seamless and will not interrupt the availability of information systems resources while preserving the confidentiality and integrity of the information and their contents. A budget request of $157 million in FY 2009 supports the Department's efforts to defend against emerging, complex cyber attacks. Through these efforts, the Department will be in a better position to effectively manage and monitor cyber risk across the complex. In FY 2009, DOE will increase support on a Department-wide basis to deploy new cyber security tools and cyber security management activities to detect, analyze, and reduce the threat across the complex.

**PROMOTING AMERICA'S ENERGY SECURITY THROUGH RELIABLE, CLEAN, AND AFFORDABLE ENERGY**

The FY 2009 request will deliver a balanced and diverse portfolio of solutions to strategically address the urgent energy and environmental challenges facing our country today. Our goal can be met by: 1) accelerating the development of clean and renewable energy technologies to dramatically increase the amount of clean energy produced in the United States; 2) advancing energy efficient technologies and practices that use less energy; and 3) providing information from research, development, and demonstration activities, which could help stimulate private sector choices that will drive change in our energy systems. DOE's applied energy programs are taking pro-active steps to catalyze the advancement of these important technologies through research and development, innovative partnerships, international cooperation through the **Asia Pacific Partnership**, and collaboration with states, industry leaders, and other stakeholders.

The budget lays the groundwork for implementing key elements of the Energy Independence and Security Act of 2007 (EISA). It contains elements that are unprecedented in size, scope and timeframe for increasing our energy security, diversifying our energy system and making America's energy systems stronger, safer and cleaner for future generations. We can further advance the U.S. commitments made at the U.N. Climate Change Meeting in Bali and the Major Economies Meetings to employ clean energy technologies in the global effort to reduce greenhouse gas emissions.

Consistent with the President's initiatives and the EISA, the FY 2009 budget contributes to key elements of the American Competitiveness and Advanced Energy Initiative that

could help reduce our dependence on oil, lessen dependence on foreign sources of energy, and change the way we power our homes, businesses, and automobiles.

The proposed Office of Energy Efficiency and Renewable Energy (EERE) budget of $1.255 billion provides a diverse portfolio of solutions to our challenges, including:

**Fuels and Vehicle Solutions (Biomass, Vehicles, and Hydrogen programs: $592.3 million)**

- Advancing essential R&D projects to achieve cost competitive, commercial scale cellulosic ethanol production by 2012;
- Conducting R&D on lithium-ion batteries, plug-in hybrids, and drive-train electrification to diversify and make our nation's vehicles more efficient to reduce petroleum dependency;
- Continuing to research and develop critical hydrogen technologies that enable a commercialization decision in 2015; and
- Supports fuel testing and validating codes and standards that will help accelerate new fuel and vehicle solutions to the market.

**Renewable Power Solutions (Wind, Solar, Geothermal, and Water Power programs: $241.6 million)**

- Integrating renewable energy technologies with energy storage technologies to resolve the intermittency challenge;
- Supporting wind power R&D to enable wind turbines to produce an increasing amount of the nation's electricity;
- Investing in solar power to make photovoltaics widely available nationwide and commercially cost-competitive with conventional electricity by 2015;
- Accelerating a refocused geothermal program that conducts enhanced geothermal systems R&D; and
- Pursuing water power technologies as part of EERE's R&D portfolio.

**Efficiency Solutions (Buildings and Industrial Technologies programs: $185.9 million)**

- Reducing energy consumption and transforming the carbon footprint of the built environment through the development of zero energy buildings; and
- Supporting the advancement of clean and efficient industrial technologies and processes that will drive a 25 percent increase in U.S. industrial energy productivity by 2017.

Our energy portfolio also recognizes the abundance of coal as a domestic energy resource and remains committed to research and development to promote its clean and efficient use. Because coal in the U.S. accounts for 25 percent of the world's coal reserves, the FY 2009 request focuses on carbon capture and storage.

- Integration of advanced **Integrated Gasification Combined Cycle** (IGCC) coal technology with **Carbon Capture and Storage** remains the foundation of the Department's clean coal research program to establish the capability of producing electricity from coal with near-zero atmospheric emissions. The Administration

remains strongly committed to **FutureGen** and is requesting $156 million in FY 2009. An additional $407 million is requested within the **Coal** program to support research and development on technologies that support the concept.

- The Coal program continues to fund large-scale demonstrations through the **Clean Coal Power Initiative** (CCPI) with $85 million requested in FY 2009 to support a Round 3 solicitation which will focus on demonstrating carbon capture and storage technologies.
- As part of the greenhouse gas mitigation strategy, the Department continues the **Carbon Sequestration** program through its large-scale field testing, and will inject carbon dioxide into several types of geological formations. Within the $407 million requested for coal research and development activities, the Department is requesting $149 million for continued work in this area.

Consistent with the FY 2006, 2007, and 2008 budget requests, the FY 2009 budget request continues to shift resources away from oil and gas research and development programs, which have sufficient market incentives for private industry support, to other energy priorities. Federal staff, paid from the program direction account, will work toward an orderly termination of the program in FY 2009.

To further assure against oil supply disruptions that could harm our economy, this budget also proposes $171.4 million for expanding the Strategic Petroleum Reserve (SPR) to an ultimate capacity of 1.5 billion barrels by 2029. In FY 2008, DOE will use available balances for the purchase of additional SPR oil and will continue to fill using federal royalty oil until 727 million barrels is achieved in FY 2009. Capacity expansion from 727 million barrels to 1.0 billion barrels will begin in FY 2008 with land acquisition activities. The request also funds National Environmental Policy Act (NEPA) activities associated with the further expansion of SPR capacity to 1.5 billion barrels.

The Energy Policy Act of 2005 established a mandatory oil and gas research and development (R&D) program, called the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research program, which is funded from federal revenues from oil and gas leases beginning in FY 2007. These R&D activities are more appropriate for the private-sector oil and gas industry to perform. Therefore, the FY 2009 budget proposes to repeal the program through a separate legislative proposal.

The EPAct 2005 included authorization for a new **Loan Guarantee Program**. The Department requests $19.9 million in funding in FY 2009 for administrative expenses to operate the Office and support personnel and associated costs. This request will be offset by collections in the same amount, as authorized under EPAct 2005. In addition, during fiscal years 2008 through 2011, commitments to guarantee loans under Title XVII of the EPAct 2005 will total $38.5 billion. In the Energy and Water Development and Related Agencies Appropriations Act of 2008, Congress authorized the Department to issue loan guarantees under the Title XVII program until September 30, 2009. The FY 2009 budget now seeks to extend that authorization through FY 2010 and 2011 and specifies amounts and uses of loan guarantee authority for those periods consistent with congressional

guidance accompanying the FY 2008 Appropriations Act. Of the total provided, $20.0 billion will be available through fiscal year 2010 to support projects such as Uranium Enrichment, Coal Based Power, Advanced Coal Gasification, Renewables, and Electricity Delivery. The remaining $18.5 billion will be available through FY 2011 to support nuclear power facilities. The $38.5 billion provided in FY 2008 through 2011 will be in addition to the $4.0 billion in authority provided in FY 2007 under P.L. 110-05 Section 20320(a) for a total loan volume limitation of $42.5 billion.

Reliable energy information plays a critical role in promoting efficient energy markets and informing the public and policy makers. This budget requests a total of $110.6 million for the **Energy Information Administration** to improve energy data and analysis programs, reflecting a 16-percent increase over the FY 2008 enacted level.

The FY 2009 budget requests $301.5 million for the **Advanced Fuel Cycle Initiative**, the technology development element of the Global Nuclear Energy Partnership (GNEP). The request supports research and development activities focused on methods to reduce the volume and long-term toxicity of high-level waste from spent nuclear fuel, reduce the long-term proliferation threat posed by civilian inventories of plutonium in spent fuel, and provide for technologies to recover the energy content in spent nuclear fuel that help strengthen the nuclear nonproliferation regime.

Recognizing the potential of nuclear energy, the President announced GNEP in February 2006. GNEP seeks to bring about significant, wide-scale use of nuclear energy through the development of better, more efficient nuclear fuel cycles that will help reduce the volume of nuclear waste requiring ultimate disposal and strengthen the nuclear nonproliferation regime.

GNEP will build upon the Administration's commitment to develop nuclear energy technology and systems and enhance the work of the United States and our international partners to strengthen nonproliferation efforts. The GNEP strategy will accelerate efforts to:

- Provide abundant energy without generating carbon emissions or greenhouse gases (GHG);
- Recycle spent nuclear fuel to minimize waste and reduce proliferation concerns;
- Enable developing nations to safely and securely deploy nuclear power to meet their energy needs;
- Increase energy recovery from spent nuclear fuel; and
- Reduce the number of required U.S. geologic waste repositories to one for the remainder of this century.

Through GNEP, the United States will work with key international partners to develop new recycling technologies. Improving the way spent nuclear fuel is managed will facilitate the expansion of civilian nuclear power in the United States and encourage civilian nuclear power internationally to evolve in a more proliferation-resistant manner. The United States and other countries having the established infrastructure could arrange to supply nuclear fuel to countries seeking the energy benefits of civilian nuclear power,

and the spent nuclear fuel could be returned to supplier countries for eventual disposal in international repositories. In this way, foreign countries could obtain the benefits of nuclear energy without needing to design, build, and operate uranium enrichment or recycling technologies to process and store the waste.

GNEP would also help resolve America's nuclear waste disposal challenges. By recycling spent nuclear fuel, the heat load and volume of waste requiring permanent geologic disposal would be significantly reduced, delaying the need for another repository in addition to the one at Yucca Mountain for the remainder of this century. Beginning in FY 2008 in accordance with the Consolidated Appropriations Act, 2008, the Office of Nuclear Energy is funding the MOX Fuel Fabrication Facility, which was previously funded by the National Nuclear Security Administration's (NNSA) Nuclear Nonproliferation program. In FY 2009, the Department funds the **MOX Fuel Fabrication Facility** program within the Office Nuclear Energy under the Other Defense activities account at a request of $487 million.

To support the near-term domestic expansion of nuclear energy, the FY 2009 budget seeks $241.6 million for the **Nuclear Power 2010** program to support cost-shared, near term technology development and licensing demonstration activities with industry that focus on enabling an industry decision by 2010 to build a new nuclear plant. To this end, the program will continue to support industry interactions with the Nuclear Regulatory Commission on new plant license applications, as well as first-of-a-kind design finalization for standardized reactor designs.

The technology focus of the Nuclear Power 2010 program is on Generation III+ advanced light water reactor designs, which offer advancements in safety and economics over older designs. If successful, this 7-year, 50-50 industry cost-shared program could result in a new nuclear power plant order by 2010 and a new nuclear power plant constructed by the private sector and in operation by 2015.

The FY 2000 budget request includes $70 million to continue the development of next-generation nuclear energy systems known as "**Generation IV** (GenIV)." These next-generation technologies will enhance the safety, cost-effectiveness, and proliferation-resistance of nuclear power, while harnessing its potential to generate hydrogen for use as a fuel. Gen IV's FY 2009 resources will be primarily focused on long-term research and development of a gas-cooled very-high temperature reactor, the reactor technology of choice for the Next Generation Nuclear Plant (NGNP) project.

**STRENGTHENING U.S. SCIENTIFIC DISCOVERY, ECONOMIC COMPETITIVENESS, AND IMPROVING QUALITY OF LIFE THROUGH INNOVATIONS IN SCIENCE AND TECHNOLOGY**

Today our nation's ability to sustain a growing economy and a rising standard of living for all Americans depends on continued advances in science and technology. Scientific and technological discovery and innovation are the major engines of increasing productivity and are indispensable to ensuring economic growth, job creation, and rising

incomes for American families in the technologically driven 21st Century. Today it is especially vital that nations around the globe -- not only the developed nations but also the largest developing ones -- increase their strategic national investments in scientific research with an eye to global economic competition.

The Science program at the Department of Energy delivers discoveries and scientific tools that transform our understanding of energy and matter and advance the national, economic, and energy security of the United States. Science is a primary sponsor of basic research in the United States, leading the nation to support the physical sciences in a broad array of research subjects in order to improve our energy security and address issues ancillary to energy, such as climate change, genomics, and life sciences. In FY 2009, the Department requests $4.7 billion, an increase of 18.8 percent over the enacted FY 2008 appropriation, to continue to invest in science research that supports the American Competitiveness Initiative.

The **High Energy Physics** ($805.0 million) program conducts **basic** research on the nature of matter and energy at its most fundamental level, seeking to understand the universe by investigating the most basic constituents of matter and energy and exploring the nature of space and time, and probing the forces that bind them together. Support is provided for operation of the Tevatron and Neutrinos at the Main Injector (NuMI) beam line which are both located at Fermi National Accelerator Laboratory (Fermilab). In addition, the request supports the research of U.S. scientists at the Large Hadron Collider in Switzerland ($72.5 million) and the U.S. involvement in the global research and development effort for a potential International Linear Collider ($35 million). The program also funds non-accelerator physics to investigate dark energy and dark matter, supernovae, solar neutrinos, black holes, and other topics, including support for the Joint Dark Energy Mission (JDEM) in partnership with NASA.

The **Nuclear Physics** ($510.1 million) program conducts research to understand the structure and interactions of atomic nuclei and the fundamental forces and particles of nature in nuclear matter in terms of their fundamental constituents. Support is provided for operation of the Relativistic Heavy Ion Collider ($161.00 million), which enables us to glimpse conditions of the very early universe, and the Continuous Electron Beam Accelerator Facility (CEBAF) ($106.4 million) which provides insight into the quark structure of matter.

The **Biological and Environmental Research** (BER) ($568.5 million) program provides the environmental and biological knowledge that promotes national security through improved energy production and use, supports the President's National Energy Plan, and conducts research to protect our environment. This research is focused in two areas: **Biological Research** and **Climate Change**. BER supports the **Genomics: GTL** program supports the most advanced biotechnology tools and techniques to probe for biological and biologically inspired solutions to Department mission challenges in energy, carbon sequestration, and environmental remediation. The FY 2009 request includes $75 million for three innovative **Bioenergy Research Centers** that will bring together multi-disciplinary teams of some of the nation's leading researchers in a mission-driven

laboratory setting to probe plants and microbes at all levels (molecular, cellular, system) in an effort to crack nature's code and achieve the breakthroughs that will make biofuels production truly cost-effective on a national scale. Climate change research includes the study of the scientifically-based predictions and assessments of the potential effects of greenhouse gas on climate and the environment, and funds DOE participation in the nation's **Climate Change Science Program** ($145.9 million).

The **Basic Energy Sciences** ($1.568.2 billion) program supports research and operates facilities to provide the foundation for new and improved energy technologies and for understanding and mitigating the environmental impacts of energy use. The FY 2009 request enhances support in high priority research areas addressing both grand challenge science and basic research needs for energy-related science. One implementation strategy will be new **Energy Frontier Research Centers,** which will bring together the skills and talents of multiple investigators to enable research of a scope and complexity that would not be possible with the standard individual investigator or small group award. The **Materials Sciences and Engineering** subprogram supports basic research to explore the scientific foundations for the development of materials that improve their efficiency, economy, environmental acceptability, and safety for energy generation, conservation, transmission, and use. Applications include lighter, stronger materials to increase fuel economy in automobiles, alloys and ceramics that improve the efficiency of combustion engines, and more efficient photovoltaic materials for solar energy conversion. **Chemical Sciences**, **Geosciences**, and **Energy Biosciences** support research crucial for improving combustion systems, solar photoconversion processes, and for applications to renewable fuel resources, environmental remediation, and photosynthesis. BES supports the Advanced Energy Initiative with solar conversion and biomass production research. A major part of the BES mission is to build and operate world-class user facilities including the Spallation Neutron Source at ORNL, the world's most powerful neutron scattering facility. All five of the Nanoscale Science Research Centers, part of the **National Nanotechnology Initiative**, will be fully operational in FY 2009 with a total request of $101.2 million.

The **Advanced Scientific Computing Research** ($368.8 million) program delivers forefront computational and networking capabilities to scientists nationwide that enable them to extend the frontiers of science. Leadership in scientific computation is a cornerstone of the Department's strategy to ensure the security of the nation, and to succeed in its science, energy, environmental quality, and national security missions.

Fusion is the energy source of stars, including our own sun. The **Fusion Energy Sciences** ($493.1 million) program is the national research effort to advance plasma science, fusion science, and fusion technology -- the knowledge base required for an economically and environmentally friendly, carbon free energy. DOE is also one of seven international parties participating in the **ITER** project, an international burning plasma fusion experiment to be built in Cadarache, France. The FY 2009 request provides $214.5 million for the U.S. contribution to this international effort.

**ENSURING AMERICA'S NUCLEAR SECURITY**

The **National Nuclear Security Administration** (NNSA) continues significant efforts to meet Administration and secretarial priorities, leveraging science to promote national security. The FY 2009 President's budget request is $9.1 billion, essentially level with the FY 2008 appropriation, to meet defense and homeland security-related objectives:

- Transforming the nuclear weapons stockpile and infrastructure while meeting Department of Defense requirements;
- Conducting innovative programs in the nations of the former Soviet Union and other countries to address nonproliferation priorities;
- Supporting naval nuclear propulsion requirements of the U.S. Navy;
- Maintaining comprehensive physical and cyber security for facilities, employees and information by implementing and sustaining upgrades throughout the complex;
- Providing nuclear counter-terrorism and emergency response assets in support of homeland security;
- Reducing the deferred maintenance backlog and achieving facility footprint reduction goals; and
- Providing corporate management and oversight for NNSA program operations.

The United States continues a fundamental shift in national security strategy to address the realities of the 21st century. The FY 2004-directed reductions to the U.S. nuclear weapons stockpile were completed in 2007, five years early. Today's nuclear weapons stockpile is now the size envisioned for 2012, and by 2012 it will be almost 15 percent less than that -- a total that is just 25 percent of what it was at the end of the Cold War. Consistent with the Administration's Nuclear Posture Review, the Department of Energy has created a vision for a revitalized nuclear weapons complex that is significantly more agile and responsive, and will allow further reductions in the nuclear stockpile by providing an industrial hedge against geopolitical or technical problems.

In compliance with the National Environmental Policy Act, NNSA is preparing a Complex Transformation supplement to the 1996 Stockpile Stewardship and Management Programmatic Environmental Impact Statement. In January 2008, NNSA announced a *preferred alternative* for the future nuclear weapons complex infrastructure that identifies the proposed major facilities, and consolidations of missions, capabilities, and special nuclear materials. The FY 2009 budget includes funding to pursue a program consistent with the preferred alternative, with NNSA planning to promulgate a Record of Decision in 2008.

The FY 2009 budget request of $6.6 billion for **Weapons Activities** includes programs to meet the immediate national security requirements of the stockpile, including stockpile surveillance, annual assessment, life extension programs, and warhead dismantlement. The campaigns are focused on long-term vitality in science and engineering, and on R&D supporting current and future stockpile stewardship and DoD requirements. Readiness in Technical Base and Facilities supports facilities and operations across the government-

owned, contractor-operated nuclear weapons complex. A number of these NNSA programs and facilities also support scientific research users from other elements of the Department, federal government, and the academic and industrial communities.

Growth areas in the Weapons Activities appropriation include **Cyber Security** and **Nuclear Weapons Incident Response**. The Cyber Security activities increase to support a major five-year effort focused on revitalization, certification, accreditation and training across the NNSA complex. The Nuclear Weapons Incident Response program increases due to functional transfers of emergency management and counterterrorism-related activities. Defense Nuclear Security activities focus on maintaining and implementing security upgrades needed to address the DOE Design Basis Threat. A new Transformation Disposition program is proposed at $77.4 million to begin to eliminate excess NNSA facilities in concert with transformation activities.

The FY 2009 budget request for the **Defense Nuclear Nonproliferation** appropriation totals $1.2 billion. The appearance of a significant decrease is due to the final FY 2008 enacted appropriations that added about $480 million in funding above the President's request to programs in this account. In addition, the Consolidated Appropriations Act, 2008, (P.L. 110-161) shifted the funding for the Mixed Oxide (MOX) Fuel Fabrication Facility to DOE's Office of Nuclear Energy and funding for the related Pit Disassembly and Conversion Facility/Waste Solidification Building (PDCF/WSB) project to the Weapons Account. This shift represents over $600 million in funding that would have been requested within the Defense Nuclear Nonproliferation appropriation in FY 2009. These shifts do not change or diminish in any way the importance of these projects to the nation's nuclear nonproliferation efforts, and in total, the funding commitment to DOE's nonproliferation activities is $1.8 billion in FY 2009. The budget describes a shift in emphasis from work completed under the Bratislava agreement to additional **Second Line of Defense** sites, including Megaports, and continued expansion of nuclear and radiological material removal under the **Global Threat Reduction Initiative**.

In FY 2009, NNSA's nonproliferation programs will complete major activities in the **Elimination of Weapons Grade Plutonium Production** program, as well as complete upgrades associated with the agreement from the Bratislava Summit. Our focus shifts to sustainability support to Russian warhead and material sites with completed upgrades, and acceleration of projects to assist the Russian Federation and other partner countries in establishing the necessary infrastructure to sustain effective material control operations. The budget request also provides for the installation of radiation detection equipment at an additional 49 foreign sites in 14 countries and at 9 additional Megaports, for a total of 32 ports completed.

The FY 2009 request also supports research and development on detection technology, and a new **Next Generation Safeguards Initiative** (NGSI), which aims to strengthen international safeguards and revitalize the U.S. technical base. The budget request supports continued significant expansion of nuclear and radiological material removal under the Global Threat Reduction Initiative; and initiates support of disablement, dismantlement, and verification of nuclear programs in North Korea.

NNSA continues to support the U.S. Navy's nuclear propulsion systems. The FY 2009 request for **Naval Reactors** of $828 million is an increase of about 6.9 percent over the FY 2008 appropriation. These programs ensure the safe and reliable operation of reactor plants in nuclear-powered submarines and aircraft carriers, and fulfill the Navy's requirements for new nuclear propulsion plants that meet future requirements.

**PROTECTING THE ENVIRONMENT BY PROVIDING RESPONSIBLE SOLUTIONS TO THE ENVIRONMENTAL LEGACY OF NUCLEAR WEAPONS PRODUCTION**

The federal government has the dual responsibilities of addressing the nuclear weapons production legacy of our past and providing the necessary environmental infrastructure for today that will ensure a clean, safe and healthy environment for future generations. As such, the Department is committed to strategic acquisitions for long-term waste treatment projects and the implementation of sound project management principles to meet our long-term cleanup commitments. In FY 2009, a total of $6.2 billion is dedicated to supporting three key pillars that set the framework for the Department to reach these goals. The first pillar is to continue the **environmental cleanup** ($5.5 billion) of contaminated Cold War sites across the country. The second pillar is to continue to provide **long-term stewardship** and to carry out our responsibilities ($186 million) to our former contractor workforce. The third pillar completes the framework by working to construct a permanent nuclear waste repository at **Yucca Mountain** ($494.7 million) to address long-term nuclear waste disposal and to defend the License Application that we will submit in 2008 to the Nuclear Regulatory Commission for authorization to construct the repository. My core principle of safe operations throughout the Department will be dynamically applied within this framework.

To deliver on the Department's obligations stemming from 50 years of nuclear research and weapons production during the Cold War, the **Environmental Management** program (EM) continues to focus its resources on those activities that will yield the greatest risk reductions, with safety as the utmost priority. To achieve a balance of risk reduction and environmental cleanup, the FY 2009 request of $5.5 billion supports the following activities, in priority order:

- Stabilizing radioactive tank waste in preparation for treatment (about 34 percent of the FY 2009 request);
- Storing and safeguarding nuclear materials and spent nuclear fuel (about 20 percent of the FY 2009 request);
- Disposing of transuranic, low-level and other solid wastes ( about 14 percent of the FY 2009 request); and
- Remediating major areas of our sites and decontaminating and decommissioning excess facilities (about 23 percent of the FY 2009 request).

The Administration recognizes that EM's FY 2009 budget request of $5.528 billion is based on, and would implement, an environmental management approach under which the Department would not meet some of the milestones and obligations contained in all of

the environmental agreements that have been negotiated over many years with regulators. It is also important to recognize that some upcoming milestones will be missed regardless of the approach that is chosen and its associated level of funding. Moreover, some of the relevant agreements were negotiated many years ago, with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. This incomplete knowledge, coupled with other issues including contractor performance, overly optimistic planning assumptions, and emerging technical barriers, also have impeded the Department in meeting all milestones and obligations contained in the environmental compliance agreements.

In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people. In determining these priorities, the Department works closely with federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with DOE.

In FY 2009, EM is aggressively pursuing the consolidation and disposition of surplus plutonium and other special nuclear materials to enhance national security and to minimize the storage risks and costs associated with these materials. In addition, EM continues to make significant progress on the construction and operation of waste treatment and immobilization facilities across the complex. The budget continues shipments of remote-handled transuranic waste to the Waste Isolation Pilot Plant.

The EM program has made great strides in achieving cleanup results. Since 2001, EM has cleaned up and closed 14 sites, including three former weapons production sites -- Rocky Flats and Fernald, with Mound to be completed in FY 2008, -- as part of its risk-reduction cleanup strategy. In the fall of 2007, DOE transferred nearly 4,000 acres of its former Rocky Flats nuclear weapons production site to the Department of Interior's U.S. Fish and Wildlife Service for use as a National Wildlife Refuge. Additionally, the Rocky Flats Cleanup Team received the 2007 Service to America Medal for Science and Environment for completing the first successful cleanup of a former nuclear weapons facility. In 2007, DOE's Waste Isolation Pilot Plant in New Mexico celebrated its 6000$^{th}$ safely received shipment, reached a milestone for disposal of over 50,000 cubic meters of waste and began disposing of remote-handled transuranic waste. DOE's Closure Project at Fernald, a 900-acre former uranium processing facility located in southwest Ohio -- was named the 2007 Project of the Year by the Project Management Institute.

Recognizing that cleanup completion dates at the majority of EM sites extend beyond 2013, EM is working to improve project and program management in a number of areas. EM is strengthening its project baselines, verifying the reasonableness of scope, cost and schedule of all environmental projects. These baselines will provide the basis for

conducting credible analyses to better assess existing priorities and identify opportunities to accelerate cleanup work. Working collaboratively with the sites, EM is also continuing to seek aggressive but achievable strategies for accelerating cleanup of discrete sites or segments of work. In addition, functional and cross-site activities such as elimination of specific groundwater contaminants, waste or material processing campaigns, or achievement of interim or final end-states are being evaluated. Developing robust life-cycle planning capabilities, realistic near-term baselines, as well as a focused technology program, a best-in-class project management system, an acquisition strategy that promotes performance and efficiency, and a proactive human capital plan allows EM to build a reliable, high-performing organization that will continue to advance risk reduction and cleanup across all EM sites.

After the Environmental Management program completes cleanup and closure of sites that no longer have an ongoing DOE mission, post closure stewardship activities are transferred to the **Office of Legacy Management** (LM). Post closure stewardship includes long-term surveillance and maintenance activities such as groundwater monitoring, disposal cell maintenance, records management, and management of natural resources at sites where active remediation has been completed. At some sites the program includes management and administration of pension and benefit continuity for contractor retirees.

Over the last 50 years, our country has benefited greatly from nuclear energy and the power of the atom. We need to ensure a strong and diversified energy mix to fuel our nation's economy, and nuclear power is an important component of that mix. Currently more than 50,000 metric tons of spent nuclear fuel is located at over 100 above-ground sites in 39 states, and every year reactors in the United States produce approximately 2,000 additional metric tons of additional spent fuel. In order to ensure the future viability of our nuclear generating capacity, we need a safe, permanent, geologic repository for spent nuclear fuel (SNF) and high-level nuclear waste (HLW) at **Yucca Mountain**. The FY 2009 budget of $494.7 million sets us on the path to meet that goal. The funding will support continued development of a repository including:

- Robustly defending the License Application (LA) that we plan to submit to the Nuclear Regulatory Commission in 2008;
- Progression of preliminary designs for facilities required for the receipt of SNF and HLW;
- Continuing essential interactions with state, local, and tribal governments needed to support national transportation planning;
- Completing the horizontal layout of the Right-of-Way application for the Nevada Rail Line;
- Enhancing the design, staffing, and training of the OCRWM organization so that it has the skills and culture to design, license, and manage the construction and operation of the Yucca Mountain Project with safety, quality, and cost effectiveness;
- Addressing the federal government's mounting liability associated with unmet contractual obligations to move SNF from commercial nuclear plant sites; and

- Planning a compliant and well-integrated safeguards and security, safety, and emergency management program for the disposal, transportation, and management of SNF and HLW.

Designing, licensing and constructing a permanent geologic repository for spent nuclear fuel and high level waste will help resolve the challenge of safe disposal of these materials and make construction of new nuclear power plants more feasible, helping to expand our energy options and secure our economic future. In addition, a repository is necessary to support nuclear nonproliferation goals, contributing to national security objectives.

In late 2006, the Department announced its "best-achievable schedule" to initiate repository operations was in 2017. The opening date of 2017 was predicated upon enactment of pending legislation and was developed without regard to budget constraints. Given the funding levels in FY 2007 and FY 2008, the "best-achievable schedule" of 2017 for the initial operating capability date is no longer possible. There is an immediate and strong need to address the funding of the repository construction program now for FY 2009 and beyond. To ensure program success it is critical that the Administration's legislative proposal, the Nuclear Fuel Management and Disposal Act, be enacted to provide stability, clarity, and predictability to the Yucca Mountain repository project. Without funding reform, development of a credible schedule for the program is not possible.

**ENABLING THE MISSION THROUGH SOUND MANAGEMENT**

The Department of Energy is committed to continuing the transformation of its management culture and increasing its focus on results. The Department has continued its efforts to improve in key functional areas and is using its strategic plan as the roadmap to instill management excellence.

The Department's human capital management efforts are focused on an integrated approach that ensures human capital programs and policies are linked to the Department's missions, strategies, and strategic goals, while providing for continuous improvement in efficiency and effectiveness. The Department has revised its human capital management strategic plan to address future organizational needs, workforce size, skill gaps, performance management systems and diversity. In FY 2009, the Department will implement key components of this strategic plan, especially critical efforts to ensure the Department's workforce has the necessary skills to carry out its critical mission. To accomplish this goal, the Department will continue to implement strategies to attract, motivate and retain a highly skilled and diverse workforce to meet the future needs of the nation in such vital areas as scientific discovery and innovation.

To continue to improve the Department's stewardship of taxpayer dollars, the Department will continue to issue audited financial statements in an accelerated timeframe and provide assurance that the Department's financial management meets the highest standards of integrity. The Department's FY 2007 financial statements were

reviewed by independent auditors and received an unqualified "clean" opinion. This was made possible by implementing an aggressive plan to mitigate and remediate a number of financial management challenges that were identified by the Department and its independent auditors. The Department in FY 2009 will continue its effort to build and improve its integrated business management system, I-MANAGE, with the deployment of budget execution and formulation modules.

The Department continues to make strides in improving performance. The Department and OMB have worked collaboratively to complete a Program Assessment Rating Tool (PART) review for 51 of the Department's 56 programs (91 percent). Since 2002, the Department's average PART score has steadily improved from Adequate to Moderately Effective. The Department is also leading the government in the number of Effective and Moderately Effective programs.

In FY 2007, the Department improved the quality of its performance measures. This was accomplished by evaluating 30 percent of the Department's FY 2008 performance measures against a standard set of criteria. This analysis identified a need for the Department to improve some of its performance measures to make them more outcome focused and trendable.

In FY 2008, DOE will work with OMB to improve the quality of PART performance and efficiency goals. This initiative will support implementation of Executive Order 13450, Improving Government Program Performance. The quality review will result in improved goals, more consistency between performance information in the PART and the budget submission, and improved performance measures.

To improve financial performance in project management, the Department enhanced the use of Earned Value Management (EVM) techniques that objectively track physical accomplishment of work and provide early warning of performance problems. A certification process was instituted for contractors' EVM systems to improve the definition of project scope, communicate objective progress to stakeholders and keep project teams focused on achieving progress. Currently, 70 percent of the Department's capital asset projects have certified EVM systems. In FY 2009, the Department will continue toward our goal of ensuring all projects have certified systems which will make projects far more likely to stay within planned cost and schedule.

The Department continues to strengthen information technology management by consistent execution of robust IT Capital Planning and Investment Control oversight and reporting processes designed to ensure successful investment performance, including the use of EVM Systems as appropriate, and the remediation of poorly performing investments. Through the establishment and use of an Enterprise Architecture that aligns to the Federal Enterprise Architecture, DOE has ensured that all IT investments follow a comprehensive Modernization Roadmap.

The Department continues to take significant actions to improve its cyber security posture by implementing its **Cyber Security Revitalization Plan** to address long-standing,

systemic weaknesses in DOE's information and information systems. Specifically, the Department seeks to ensure that 100 percent of operational information technology systems are certified and accredited as secure and that the Department's Inspector General has rated the certification and accreditation process as "satisfactory." Additional steps will be taken to ensure that electronic classified and personally identifiable information are secure.

To manage the Department's large real property portfolio requires reliable data. The Department has improved its Facility Information Management System and satisfied the Federal Real Property Council's goal of 100 percent reporting of all data elements. Further, the Department implemented a statistical validation program to ensure the integrity of real property data and better support real property decision-making. To make continuous improvements, the Department will invest in its infrastructure to reduce overall facility square footage, improve energy efficiency and sustainability, and implement an active asset management plan to align resource needs with key Departmental goals.

**CONCLUSION**

I appreciate the opportunity to appear before you to present the FY 2009 budget proposal for the Department of Energy. I will be happy to take any questions that members of the Committee may have.

MANAGEMENT OF MOX PROGRAM

Mr. VISCLOSKY. Mr. Secretary, thank you very much.

The first question I would have is I would like to discuss what we have talked about many times, and Mr. Hobson has alluded to it, and that is the MOX plant in South Carolina. We ended up providing enough new budget authority to bring MOX funding to $300 million, and $94 million for the current fiscal year. However, since this had changed from a nonproliferation project to an energy project, we decided the program should be managed by Nuclear Energy. In the bill signed into law by the President of the United States of America, we shifted the funding out of NNSA.

Mr. Secretary, it appears as if NNSA continues to manage the program. We were very clear in the direction, and how much longer will it take the Department to follow congressional directive in a law signed by the President of the United States?

Secretary BODMAN. Mr. Chairman, as I understand it, and I have reviewed this matter as recently as yesterday, the general counsel of the Department of Energy takes the view that I am not permitted under the NNSA Act, the creation of the NNSA, to move any activities out of the NNSA to other parts of this department.

Therefore, we have taken and tried to respond in every possible way that we could. It is still being managed by the NNSA, but it is being managed with the overall supervision of the Nuclear Energy Office, as you have instructed. We are continuing to do work in the legal department, in our General Counsel's office, in order to determine the final answer, but at least on a preliminary basis, that is what I am told.

Mr. VISCLOSKY. We have a law that the President signed into law. We gave you the money.

Secretary BODMAN. I understand that, sir.

Mr. VISCLOSKY. We gave you the money, but made a clear distinction because it was eating nonproliferation alive, and we have problems in places like Pakistan, that this is an energy program which is fine. I mean, Mr. Hobson, we obviously have a long track record opposed to MOX.

Secretary BODMAN. Right.

Mr. VISCLOSKY. We gave the Department the money, but clearly said where it ought to be managed, and we have a law to that effect, and your lawyer is telling you not to do it.

Secretary BODMAN. My lawyer is telling me that I am not capable of doing it.

Mr. VISCLOSKY. Despite the fact that we passed a law?

Secretary BODMAN. Despite the fact that you passed the law. Yes, sir.

Mr. VISCLOSKY. Congress passed the law.

Secretary BODMAN. That Congress passed the law and the president signed it.

Mr. VISCLOSKY. And the administration doesn't want to do it.

Secretary BODMAN. It is not a matter of not wanting to do it, sir. It is looking at the creation of the NNSA and what the authorities are that have been granted to the Secretary of Energy. I am not permitted, according to what I am told, to move the project as instructed by Congress. Therefore, we have taken and done every-

thing we know how to do, that is to say have it managed by the Nuclear Energy Office as they are overseeing this activity. But the day-to-day management is continuing to be in the NNSA.

Mr. VISCLOSKY. Has your legal department provided you with any e-mails or memorandums or paper documents to that effect?

Secretary BODMAN. The legal department has provided me with verbal information of the sort that I have just described, and they are in the process of preparing a written document to that effect.

Mr. VISCLOSKY. Do you know if your legal department has prepared a memorandum that is the basis of their oral conversations with you to that effect?

Secretary BODMAN. No, sir, I do not know.

Mr. VISCLOSKY. Could you answer for the record whether they have, and if they have, if you would submit those as part of your testimony to the committee?

Secretary BODMAN. I would be happy to do that.

MOX TRANSFER

Materials related to the DOE General Counsel legal decision on the MOX transfer from the National Nuclear Security Administration to the Nuclear Energy Office were supplied directly to the Energy and Water Development Subcommittee.

Mr. VISCLOSKY. I appreciate that.

CONGRESSIONAL DIRECTION

Second, the conference report clearly directed that 50 percent of fiscal year 2008 Advanced Fuel Cycle Initiatives, GNEP research and development funds, roughly $75 million, are to be made available in an agency-wide solicitation for universities, national laboratories, and commercial entities. Once again, it is certainly our belief that the direction was clear and definite.

However, it took the Department 2 months to figure out, apparently, what was in the conference report, and some additional period of time to finally come up to the Hill and speak to us about it. It is unfortunate that the Department of Energy has gone ahead and allocated funds under the CR in a way that apparently makes following the congressional directive difficult.

Perhaps if the Department had consulted with the Committee months ago, we wouldn't be in the current position we are. Could you tell us where you are in implementing the direction contained in the conference report?

Secretary BODMAN. We are all for competition. That is an important matter, and apparently we had developed the idea that there would be independent areas of the academic community, the national laboratories, and private industry. The staff apparently wanted a competition run for all, and so we have had to start over again, having started down the path that I just indicated. So that is what took a couple of months.

We are continuing to develop a plan for that. We expect to have that done shortly, that is to say within the next month or so. And we will proceed to move forward. I think that it is likely, as I think is indicated in the Committee's judgment, that there will be I think it is 50 percent of the GNEP activity is supposed to be done by competition. I think we are probably going to fall short of that, but we are doing our absolute level best to do it, and there is no reluc-

tance on the part of the department to follow the intent of Congress.

Mr. VISCLOSKY. Why would you fall short on the 50 percent?

Secretary BODMAN. Because I am not halfway through the year.

Mr. VISCLOSKY. You are halfway through the year now, but the bill was passed in December.

Secretary BODMAN. I understand that. The bill was passed at the time right before Christmas.

Mr. VISCLOSKY. Right.

Secretary BODMAN. In effect, the first quarter of the year was gone.

Mr. VISCLOSKY. Right.

Secretary BODMAN. I have been developing the responses of the sort that I have already described, and we are continuing to do work. We will have a competition, but we have also been following under the Continuing Resolution. We have been following the direction, what we felt was the direction of Congress, with respect to funding individual laboratories, individual universities, and individual private companies.

Mr. VISCLOSKY. Mr. Secretary, you mention in your answer that staff at DOE wanted to do something.

Secretary BODMAN. It is not a matter of wanting.

Mr. VISCLOSKY. Congress—Congress said it should be 50 percent.

Secretary BODMAN. I understand that.

Mr. VISCLOSKY. So to be honest with you, I don't care what the staff thinks. Congress said 50 percent.

Secretary BODMAN. I understand.

Mr. VISCLOSKY. And not just people on this subcommittee.

Secretary BODMAN. I understand.

IDAHO NATIONAL LAB

Mr. VISCLOSKY. Next question. The fiscal year 2008 omnibus include $14.8 million in funding and directed the NNSA to refurbish building 561 and complex building 691 at Idaho National Lab for material consolidation and other purposes. Are you aware that NNSA has informed the committee that it does not intend to comply with this congressional direction and is going to use the funding for other purposes?

Secretary BODMAN. I am aware of it. I am aware that we are going to request to use the funding for other purposes.

Mr. VISCLOSKY. What is so hard about following direction in a law signed by the President of the United States, that is agreed to by 535 elected legislators of a coequal branch of the government under the Constitution of the United States?

Secretary BODMAN. We think that——

Mr. VISCLOSKY. And there is no signing letter.

Secretary BODMAN. I am sorry.

Mr. VISCLOSKY. And don't get me started on that.

Secretary BODMAN. I didn't hear.

Mr. HOBSON. Well, I was just asking, if you would—and there is no signing letter.

Secretary BODMAN. I don't know what a signing letter is, Mr. Hobson.

Mr. HOBSON. Unfortunately, we have learned too much about them in this administration. I think most of the people in the past were limited in doing it. It is when the president signs a letter that says "we don't like this part of a bill, so we are not going to enforce it." I think they are outrageous.

There isn't one on this, as far as I know, on this bill. So that is part of our problem. We find it difficult to understand if a law is passed and it is the law of the land, why it is not being followed, especially if there is this tactic that has been used recently. A lot of presidents used it in the past, but never to the degree it is being done now.

So we find that particularly unusual, I guess, the fact that there isn't a signing letter, that somebody along the way has just said "we are not going to follow what the president has signed," and we don't have anything justifying it.

I am sorry.

Mr. VISCLOSKY. And Mr. Secretary, NNSA obviously is going to come in, too, but I would suggest that you have a conversation with them that we passed a law.

Secretary BODMAN. I understand.

Mr. VISCLOSKY. They may have preferences, but we passed a law.

Secretary BODMAN. I understand.

Mr. VISCLOSKY. Okay.

Mr. Hobson.

FIVE-YEAR BUDGET PLANNING

Mr. HOBSON. Thank you, Mr. Chairman.

I have three or four issues I would like to get to. Normally, I would defer to the members of the committee, but these are things that I feel compelled to follow up on, with the chairman's understanding here.

Mr. Secretary, you know well that 5-year budget planning was one of my top business priorities when I was here, to try to get some control not from our standpoint, but control of how we spend money, have a plan, that we know where we are going. You know where we are going, we know where we are going. It is a joint priority between the chairman and myself that we still share. We didn't come up with this independently. We fostered this together.

The House report for 2008 contained clear direction requiring the department to submit updated 5-year budget plans, concurrent with the submission of the 2009 budget request. The explanatory statement accompanying the consolidated Appropriation Act for 2008 specifically states that guidance contained in the separate House and Senate reports remains effective unless modified by the explanatory statement.

Despite this clear direction, the department did not submit any 5-year budget plans for this year. Further, committee staff has been informed the department has no intention of submitting these 5-year plans for anytime later this year. I confess to being surprised at this decision, given that the department has submitted these 5-year budget plans for key DOE programs in the past several years, and has done so with the support and participation of the Office of Management and Budget.

Was the decision to ignore the congressional direction for 2009 made within the department or at OMB?

Secondly, has the department considered what the funding consequences may be for blatantly ignoring this and other directions from the Appropriations Committees?

Thirdly, given that the department is so dismissive of the direction and priorities of this committee, please explain why we should not be similarly dismissive of the priorities that you all come forward with in the budget request. Because this was a management tool. You are a management guy.

Secretary BODMAN. Yes, sir.

Mr. HOBSON. This was designed so that people knew where you were going to be in the future, so that we could help you and work with you. But it is like, you know, forget it, we are not here. It is a good tool. The Corps, for example, has found that it is a good tool. And frankly, OMB has come around in my meetings with the people at OMB that it is a good thing for the Corps to have this.

This is one of the ways we can control spending and we can control earmarks, and we know where people are going. Why your agency would so blatantly disregard this after following it for a number of years, I don't understand it.

Secretary BODMAN. First of all, just for the record, we did complete the 5-year plan for the NNSA, which is some $9 billion of the budget. So 40 percent of the budget of the Energy Department has a 5-year plan that has been submitted. On the balance of it, I plead guilty. It is between the department and OMB. It was a joint decision that has been made. I have no response to you other than that.

Mr. HOBSON. Well, we haven't see it, if there is one for NNSA.

Secretary BODMAN. Yes.

Mr. HOBSON. It isn't here, because I have asked my staff, and we have just asked here, they don't have it.

Secretary BODMAN. There is one.

Mr. HOBSON. Well, it would be nice—I mean, we only provide the money. It would be nice if it was shared at some point before we do something.

Secretary BODMAN. I understand.

Mr. HOBSON. I mean, this is just—you know how I feel about this, and we feel about this. This is a management tool to help everybody, and they have just blatantly disregarded it.

Secretary BODMAN. I can just tell you that the financial staff, and I am very proud of them——

Mr. HOBSON. I am glad you are.

Secretary BODMAN. Well, I am. They did a very good job of working on the budget and trying to get the 2009 budget right. I believe that we produced a very good document as a result of that, and it took maximum effort up until the very last minute to accomplish that.

Mr. HOBSON. But you are a businessman by background.

Secretary BODMAN. Yes, sir.

Mr. HOBSON. I can't believe that you ever ran anything without having a business plan.

Secretary BODMAN. That is correct.

Mr. HOBSON. Without having long-range plans, and that you put those down on paper so your management team knew where you were going and what you were doing.

Secretary BODMAN. I agree with that.

Mr. HOBSON. And you went to your finance people.

Secretary BODMAN. I agree with that.

Mr. HOBSON. You are now running an agency that can't do that. That is why the public has great distrust of government, is because we don't know what we are doing, and we don't put it out.

Anyway, let me go on to another question here.

RED OIL AT MOX

You know how I feel about MOX. There are reports that the Nuclear Regulatory Commission surfaced some concerns about the risk of red oil explosion at the MOX project as it is presently designed. What can you tell me about this problem and how DOE is addressing it in the design of the MOX facility. One of those things that I don't like is where you design on the fly, which got you in trouble out west, and you are doing it again.

Does the Nuclear Regulatory Commission consider this issue resolved? I think the answer is no. The NRC is allowing the department to proceed with construction of the MOX plant with certain technical issues still unresolved. It is possible that the NRC may not be able to issue an operating license after we spend these billions of dollars for the MOX plant if this red oil problem is not resolved to NRC's satisfaction.

What type of design work will need to happen to accommodate the red oil explosion concern, which I assume is going to cost us all more money. Please provide for the record a copy of all correspondence between the department and the NRC regarding the red oil issue. Also provide a copy of all internal DOE memoranda of communications, including e-mails on this issue.

I think this is a very—and this is a dumb thing to say—but a very explosive issue. We found out about this. Are you aware of this?

Secretary BODMAN. No, sir.

Mr. HOBSON. Well, frankly, sir, somebody should tell you about it, because it is a serious problem.

Secretary BODMAN. I know nothing about it, and I will be happy to try to provide a response for the record.

RED OIL ISSUE

Materials related to the Nuclear Regulatory Commission technical issue with the MOX design and the possibility of a red oil explosion were supplied directly to the Energy and Water Development Subcommittee.

Mr. HOBSON. This is an explosive issue. It is a cost-explosive issue and it may be a dangerous issue. We are continuing to build a plant and fund hundreds of millions of dollars into something that may have a serious design flaw in it right now. This is what is wrong with these—I can't think of the term right now. I don't like the way we build things in the government.

Let me switch to another subject since you can't answer that one. This is my last one. You will be happy with that, for the moment.

PDCF MANAGEMENT TRANSFER

You are saying that the NNSA Act prevents you from transferring projects such as MOX out of NNSA. We also transferred the pit disassembly and conversation facility, PDCF, from nonproliferation to weapons activities. This is all within NNSA. Has the management for PDCF been transferred to weapons activities yet? And if not, why not?

Secretary BODMAN. I believe that this activity, which falls within the nonproliferation area, is being managed in the nonproliferation area of the NNSA.

Mr. HOBSON. But we asked it to be shifted within NNSA.

Mr. VISCLOSKY. It is in the law to shift it. It is a defense program. It is not a nonproliferation program, and there was clear direction and it was in the conference report. It was in the omnibus bill and the President signed it into law. And we spent a year—a year—working on this issue to make sure that defense programs are in defense programs, and nonproliferation is nonproliferation, and energy is in energy. We wasted a year because energy has a legal department and they don't care.

Secretary BODMAN. They do care, sir. I would tell you that they care deeply about this. They are currently evaluating what is required in order to accomplish the change. The mere fact that the Congress decides to do something does not necessarily mean that I can do it. That is what we are examining.

For example, I have been instructed to move the MOX program out of the NNSA to the Nuclear Energy Office. It turns out that I cannot do that, at least according to our reading of the law.

Mr. HOBSON. I understand that one. I understand you could have a question on it. I still don't agree, and lawyers can disagree.

Secretary BODMAN. Right.

Mr. HOBSON. And we will get into that one. But this one doesn't have that same thing. This is inside NNSA. This isn't the same question, sir. This is a different question. This is somebody just saying, "we aren't going to do it."

Secretary BODMAN. Sir, it is not a matter of saying that we are not going to do it, but I want to make sure that as we do it, we are accomplishing it in a legal fashion. That is what is going on here.

Mr. HOBSON. Well, what I am trying to say to you is there is not the same legal question.

Secretary BODMAN. I understand that.

Mr. HOBSON. One is, you are saying is in NNSA and out of NNSA. This one is all inside NNSA. There cannot be the same legal question there on that. It may be a different legal question, but it is not that legal question, and I don't think it is a legal question. I think it is an attitude in the agency.

Secretary BODMAN. It is not a matter of attitude, sir. I would tell you that. You may interpret it as such, but that is not the intention. I understand that, but I am just telling you that that is not the intention. The intention is to try to do this properly, and that is this activity reports to both the nonproliferation and to the defense programs, part of the NNSA. And therefore, is that now acceptable or is it not acceptable? It is that kind of a question.

Mr. HOBSON. I think there is a way to resolve this. Get a paper. We don't have any dialogue on this. We just get inactivity. If somebody would give us a paper, then we could begin a dialogue and try to work it out to where it gets acceptable.

Secretary BODMAN. To both sides.

Mr. HOBSON. Yes. And if we need to put something in another bill—I probably won't be here when that passes and neither will you—but we can get it done, because this is what the Congress, both the House and the Senate, said to do. This isn't something that we are doing unilaterally. This is a bill.

Secretary BODMAN. I understand.

Mr. HOBSON. So anyway, I hope you sense the frustration of the chairman and myself.

Secretary BODMAN. I do. I do.

Mr. HOBSON. I think, frankly, I am not going to speak for the chairman, but I think we feel a little had, especially this problem down at MOX. I acceded, and I stopped screwing around with MOX because a deal was made and I lived up to that deal.

Secretary BODMAN. Right.

Mr. HOBSON. But when I see this sort of thing happening, and I told you at the time, I think the expenses are going to go crazy down there. This is an ill-conceived project, in my opinion, but now that is coming true, I am afraid. Once we make a deal, I want it——

Secretary BODMAN. I agree with that. All I can tell you, sir, is that I will take a look at it personally and I will respond.

Mr. HOBSON. All right, sir. Thank you.

PDCF MANAGEMENT TRANSFER

Materials related to the issues facing DOE in transferring management responsibilities of the pit disassembly and conversion facility from nonproliferation to weapons activities within the National Nuclear Security Administration were supplied directly to the Energy and Water Development Subcommittee.

Mr. VISCLOSKY. And for the record, I just want to make a note that the committee provided monies for these programs. It was not as though we eliminated funding. What we were trying to do is make sure there is segregation of programs by function.

On MOX, I would express my support for the position that Mr. Hobson has taken. It is no secret I have had great reservations about the MOX facility as well. In the end, my Ranking Member, a good friend, was a gentleman about the deal and the agreement we had to proceed with MOX. We gave them the money, but we gave them the money and said, "and you come back and you report regularly and you hit every milestone, and don't you mess up." And if people are going to mess up, then they still have a serious problem.

Mr. Israel.

WEATHERIZATION

Mr. ISRAEL. Thank you, Mr. Chairman.

Mr. Secretary, you can obviously detect a great deal of frustration and maybe even some distrust by the subcommittee. I think that the frustration and distrust isn't limited to some members of this subcommittee. I think it is felt by the American public at

large. I will give you one example of where I think those anxieties occur.

If you log onto the Department of Energy's Web site, you will learn from the Web site that weatherization reduces heating bills on an average of 31 percent, while reducing our reliance on imported oil. If you continue into the Web site, you will read that a 2002 DOE study documents, "weatherization benefits to utility ratepayers, the economy and the environment that are in addition to the energy benefits that reduce the energy bills of low-income families."

And so on the one hand, the Department of Energy touts the benefits of weatherization, but in the Department of Energy budget there is a grand total of zero dollars for weatherization. The American public is paying three times for home heating oil what they were paying in 2001. Home heating oil costs have tripled since 2001 and the department is terminating the weatherization program.

The department notes that the reason for this is that the department wishes EERE, energy efficiency and renewable energy, to focus on its core mission of advanced energy efficiency and renewable energy R&D. The department is terminating the weatherization assistance program to focus EERE on its core mission of advanced energy efficiency and renewable energy R&D.

But then when you actually study the EERE budget, you learn that hydrogen is being cut 30 percent; solar is being cut 7.3 percent; water is being cut 69 percent; industrial technologies are being cut 3.6 percent. So we are not focusing EERE on its core mission of renewable R&D. We are in fact cutting the budget for specific renewable technologies, while we are saying that we are actually increasing them.

My question is, if in fact the department believes, as it must believe because it states on its Web site that weatherization reduces heating bills an average of 31 percent and that weatherization reduces our reliance on imported oil, and that weatherization provides benefits to utility ratepayers, the economy and the environment, and as the department knows, if home heating oil costs have tripled since 2001, and if we are actually cutting specific renewable programs in the EERE, what is the rationale for terminating the weatherization program?

Secretary BODMAN. The rationale simply is the rate of return that we get. We get 20 for 1—$20 for every $1 we invest in the research programs. We get I think it is $1.50 return on the weatherization program. That is the rationale for the termination of the program.

Mr. ISRAEL. But then why are cutting hydrogen, solar, water and industrial technologies?

Secretary BODMAN. We are not cutting it. We are cutting it relative to the very generous budget that EERE got from Congress a year ago, but not from the request that we made a year ago. And so if you compare the request that we made a year ago to the request that we made this year, there is a significant increase. I don't happen to recall what it is, but we would be happy to get you the numbers. But that is the rationale, that there was a run-up in the

size—I think it was $100 million increase in the budget for EERE that they got because of congressional interest in this matter.

Mr. ISRAEL. Mr. Secretary, you made the statement that we leverage far more in our research of renewable energy technologies.

Secretary BODMAN. That is correct.

Mr. ISRAEL. Congress agrees with you, which is why we plussed-up those numbers. And now you are saying that we ought to actually reduce the congressional levels.

Secretary BODMAN. It is not a matter of reducing them. This is a question of increases that are being put in place versus what we asked for a year ago. You know, that is all I can do. I have just been handed a note, we have increases in biomass, in wind, in geothermal, in building technology, and industrial technologies.

Mr. ISRAEL. Yes, you do. Well, no, you have decreases in industrial technologies, I believe.

Secretary BODMAN. Relative to what we asked for a year ago, sir.

Mr. VISCLOSKY. If the gentleman would yield?

Mr. ISRAEL. I yield to the chairman.

Mr. VISCLOSKY. Are gas prices lower than last year or relative to last year? Or are they higher? Are energy prices higher or lower?

Secretary BODMAN. I don't carry that number around, but I am sure they are higher.

Mr. ISRAEL. Mr. Chairman, do I have additional time? Mr. Chairman?

What I hear you saying, and what I have heard you say for the past 45 minutes, is that Congress can tell me how they want to spend the money, but I will spend it the way I see it.

Secretary BODMAN. That is not what I am saying.

Mr. ISRAEL. The mere fact—in fact you said, really because Congress tells me what to do doesn't mean I can do it.

Secretary BODMAN. Well, in some cases, that is correct, witness the MOX program.

Mr. ISRAEL. I don't know if you want to go back there right now.

Secretary BODMAN. I have a law that I have to deal with. The law created the NNSA and the law limited, which was also passed by Congress and signed by the then-president that created the NNSA, prevents me from moving an activity from NNSA to any other part of the Energy Department.

Mr. ISRAEL. Mr. Secretary, do you know what the total amount for weatherization was last year?

Secretary BODMAN. It was about $250 million, I believe.

Mr. ISRAEL. Okay. Actually, it was slightly higher, but in the absence of that, what will the effects be?

Secretary BODMAN. A pretty good guess.

Mr. ISRAEL. Yes, not bad.

Secretary BODMAN. Thank you.

Mr. ISRAEL. What would the effects be, in your view, of terminating weatherization at a time when home heating oil costs have tripled?

Secretary BODMAN. The effects would be that a very small fraction of the houses that need to be dealt with won't be dealt with.

Mr. ISRAEL. So you can terminate the program in its entirety, and a small fraction of homes——

Secretary BODMAN. Yes, only a small fraction of the homes that are eligible get dealt with every year, even with $250 million.

Mr. ISRAEL. How many American homes are under-insulated? Do you know? Do you have any idea?

Secretary BODMAN. I don't.

Mr. ISRAEL. Is 40 million inappropriate?

Secretary BODMAN. I would be happy to get you the numbers, but I don't happen to know that, sir.

Mr. ISRAEL. Do you know what the loss of residential electricity is as a result of under-insulation? I have heard about 17 percent. Is that accurate?

Secretary BODMAN. I have no idea.

Mr. ISRAEL. Okay. Would you have your department get you those numbers? I got those numbers.

Secretary BODMAN. I would be happy to give you our numbers and provide them for you and get them myself.

RESIDENTIAL WEATHERIZATION

Approximately 19 percent or 20.3 million U.S. homes are reported to be poorly insulated, according to the Energy Information Administration. The Oak Ridge National Laboratory estimates that, on average, about 12 percent electricity savings per home is possible from adding insulation, although these savings vary widely by region. Each year, the Department's Weatherization Assistance Program only insulates a small fraction of the homes that need insulation.

Mr. ISRAEL. I am surprised, Mr. Secretary, that you would terminate funding for an entire program without knowing how many homes are under-insulated, what the residential electric loss is.

Secretary BODMAN. I can tell you that the number of homes that are eligible for this is far greater than the number of homes that are accommodated, even with the $250 million that we spend every year.

Mr. ISRAEL. Mr. Chairman, I will close just on this note. I understand your opinions, Mr. Secretary. I do find an inconsistency when you have a Web site that publicly touts the benefits of weatherization, and yet in testimony to this committee you say it is not that big a deal. Or when you have department information that says we are going to terminate weatherization in order to focus EERE on its core mission of advanced energy efficiency and renewable energy R&D, and then when you take down specific renewable accounts in the budget itself.

To me, it is a matter of inconsistency, and quite frankly, it fuels the frustration that you feel in this subcommittee.

I yield back my time, Mr. Chairman.

DOE MISSIONS

Mr. WAMP. Mr. Secretary.

Secretary BODMAN. Mr. Wamp, how are you, sir?

Mr. WAMP. I am fine. Thank you, sir. Thank you for your service.

The very fact that oil is $100 a barrel and the subsequent price of gasoline is where it is and climbing, makes your job all by itself, let alone these other conflicts, maybe the least-enviable job in any administration. So thank you for serving during a very difficult time.

Obviously, there is a rub, too, between the executive branch and the legislative branch, and I see that getting worse, unfortunately.

OMB doesn't help that situation. Many of these decisions are somewhat out of your control. I am not defending you or the chairman and the ranking member. I am just telling you that I have been on this subcommittee for 11 years, and it seems to be getting worse, this division between the executive branch and the legislative branch. That is unfortunate.

The interesting part about my parochial interest representing Oak Ridge is that we carry out a multitude of primary missions for the Department of Energy at my site, from national security under the NNSA to major science programs and environmental management and others. But those three major missions on any given year, there is always one that is in need of extra attention.

So I want to focus on that particularly now. I want to say that the weapons and NNSA missions for the most part are funded in the budget request. Some changes could be made, but it is satisfactory. The science missions are also supported, and I am grateful for Orbach's leadership and for your commitment to science because, as you said a minute ago, the return on these investments is enormous for our country. Our competitiveness in the world is very important, and the administration has made a big issue out of that.

I do want you to answer whether you expect the fusion-ITER mission to be funded in a supplemental request from the administration, because that is a question mark in the science world, which is are we going to honor our commitments or not, and will that be a supplemental request on science.

But my major thrust, and I am just going to make this statement and let you answer, and I will be done, is with environmental management. This administration said we are going to have a program called accelerated cleanup. We are going to clean this up quicker to save money because everyone knows if you will go ahead and do it, you save this long-term $5.5 billion annual obligation of the nuclear legacy in this country, and it is a mess.

And there are conflicts between the states and the federal government. We have them in Washington state. We have them in Tennessee. We have the governors breaking bad on us once again for not meeting our milestone on agreements that the federal government has with the states about cleanups that will be made. I am sure Mr. Simpson is going to talk about this in Idaho.

But the fact is, this is the lowest budget request for environmental management in 15 years. At my site, the gross amount is $100 million. The net amount is $50 million reduction from last year. And I am hopeful that the subcommittee will see fit to restore the money. But I just want to ask you to explain the challenges you face at trying to prioritize environmental management in your budget against these other issues, and if you think sometimes OMB just undercuts these requests, hoping that the Congress will put the necessary money in.

I will yield the floor to you, Mr. Secretary.

ENVIRONMENTAL MANAGEMENT

Secretary BODMAN. Well, as we looked at the budget, we have a reduction in the overall money that we can spend in environmental management, as we have negotiated this out with our friends at OMB. It is a reduction, and therefore we have to make reductions.

What we do is to try to look at areas that are not harmful to the American public, that are intended to have money spent on them, or at least the plan is.

One of them is the so-called D&D accounts, the decontamination and decommissioning—the D&D account. Generally, those are buildings that are very old, that are 50 years old or more, a number of which are at Oak Ridge. We have deferred those because they are not harmful to the environment.

In Idaho, just to anticipate Mr. Simpson's questions later that I expect will be there, in Idaho it is the same kind of thing where we are looking at the salt-bearing waste material that is there, and it is stored and not harmful to the public as best we can tell. So we have deferred that for a couple of years, at least that is the plan in the budget.

And so, it is strictly that. It is strictly trying to prioritize. We have increased funding for Oak Ridge in a number of areas in science and in other aspects. It is in that area that we have concluded that we don't need, or have an absolute need at this time to spend that money.

Mr. WAMP. A quick followup just to say that this administration excited everyone across the DOE complex with a proposal called accelerated cleanup, literally saying we are going to throw the ball deep; we are going to cut these long-term costs; we are going to spend more in the shortrun to save money in the longrun, and we are going to get our arms around this problem because this problem has been mounting and we are just stirring the pot and we are not really cleaning up the sites.

And they set these goals. And it is called accelerated cleanup. I have to report, as the administration closes out, that I am concerned that my administration is going to end up with decelerated cleanup instead of accelerated cleanup because you just admitted you are deferring.

Secretary BODMAN. I fear that you are right.

Mr. WAMP. Yes, well, that is unfortunate.

Secretary BODMAN. I was not the beneficiary of the acceleration.

Mr. WAMP. I understand.

Secretary BODMAN. I was the beneficiary of the deceleration. So that we have been living with the commitments that were made by OMB to reduce budgets. That is what the commitment is and so we are living with it.

Mr. WAMP. And I appreciate your candor, because it is brutal honesty, but I hope the subcommittee realizes the wisdom in going ahead and making these investments so we don't end up in legal conflicts with the states, so that we can honor these obligations, and in my site, so we can move on with what is called IFDP, the integrated facilities disposition plan, to take these World War II-era legacy buildings and get them out of the way and move on with cleaning up and meeting the water issues and the land issues with our states across this nuclear complex. You can't keep deferring this, but I do thank you very much for trying to get your arms around these difficult issues and for your appearance today.

Thank you, Mr. Chairman.

PROJECT MANAGEMENT

Secretary BODMAN. If I may say, in contrast to the suggestions that were made by both the chairman and the ranking member, I do believe that the project management activities within the department are very substantially improved over that which I found when I got here. I think that even the GAO would even believe that, based on results that they have been discussing with my colleagues.

Mr. WAMP. Thank you, Mr. Secretary.

Mr. VISCLOSKY. Mr. Hobson.

Mr. HOBSON. Mr. Secretary, one of the things that OMB is doing with the thing that you just talked about with Zach is increasing costs long-term, because those projects will go up in cost.

Secretary BODMAN. I agree with that, sir.

Mr. HOBSON. I want to get this in the record. I asked your people out there if they had a copy of the committee print and they don't apparently have it with them. It is surprising to me that nobody brought a copy of this important document, at least we so deem it.

On page 478, and I am not going to ask you to do too much of this now because you don't have it in front of you, it clearly in law, not in just report language, says that $238,840,000 is authorized—authorized—to be appropriated for project 99–D–143 mixed oxide fuel facility, under the nuclear energy side, for the facility at Savannah River. And then it tells you to follow the law, the executive order 413.3(a). What I am trying to point out is that in law, you have an old law that is technically amended here, and the new law is what should be followed, not the old law.

We don't have to debate this now, but I want your lawyers to read that and look at it, and then you come back.

Secretary BODMAN. We will be happy to do that, Mr. Hobson.

Mr. HOBSON. And we can talk about this, because this is in law, sir. This is not report language, which you all say, well, we don't have to follow report language. But I am going to tell you frankly, if this administration continues to do what they are saying and not follow what is in report language whenever they don't want to, then you are going to lose a lot of flexibility that you have now, because Congress is going to frustrated and they are going to put everything in law, and then you lose. You lose.

Anyway, this is in the record, and I want this in the record, to understand that this is a serious matter. We moved it. It is authorized. The money is there. This is not in report language, and so there can't be this—it is a later law.

Secretary BODMAN. I understand that it is later. Our position is that that moves the money, but it does not move the management responsibility for the project. The management responsibility resides in the NNSA, and I am unable to move it.

Mr. HOBSON. [OFF MIKE]

Secretary BODMAN. No, I understand that.

Mr. HOBSON. [OFF MIKE]

Secretary BODMAN. Well, it is not a matter of the attitude, sir. It is just a matter of what is acceptable under the law. That is all.

Mr. HOBSON. Well, as interpreted by your lawyers.

Secretary BODMAN. But I want you to understand, Mr. Hobson, that the intention——

Mr. HOBSON. You guys didn't want to do this. We understand that. We know you didn't want to do this.

Secretary BODMAN. No, it is not a matter of that. It really isn't. We will do it. I mean, if that is something that is important to this Congress, then we will do it. That is not the issue.

Mr. PASTOR. [OFF MIKE]

Secretary BODMAN. Apparently, it is.

Mr. HOBSON. It was everybody's intention to do this, sir, and we feel that there has been every intention—because we know there was push-back not to do this. But we did it and the Senate agreed to it and you guys agreed to it, and then after the fact, somebody goes around—I mis-spoke. I don't want to say you agreed to it, but you got it. And then they set about in our opinion to find a way not to do it because they really didn't want to do it. We thought it was best that that money be somewhere else.

Secretary BODMAN. I understand that. I would just say to you, sir, that is not the way it has been presented to me. It may be that that is the intention, that there is some deep sinister plot of which I am unaware. I am telling you that I am not aware of it.

Mr. HOBSON. Well, I am not sure it is a deep sinister plot, but we think it is a plot.

But anyway——

Mr. VISCLOSKY. Mr. Simpson.

Mr. SIMPSON. Welcome to the committee, Mr. Secretary.

Secretary BODMAN. I am happy to be here, sir.

Mr. SIMPSON. It is a good day, isn't it?

It is a happy time. I know it is.

It is kind of interesting listening to the discussion. You know, if the department doesn't want to do something—and I am not saying this is the case—an attorney can make the case, we can find a way that we won't be allowed to do it, or if an attorney wants it, we can find a way that the department will do it. They can find a way to make it happen, seems like all the time. But I don't want to get into that.

OMB BUDGET DISCUSSIONS

I want to raise a couple of other questions. First of all, can you give us a copy of the original budget submission that the department made to OMB?

Secretary BODMAN. No, sir.

Mr. SIMPSON. Is there a reason for that? Is this classified as top secret?

Secretary BODMAN. Sure. Well, it is not a matter of that. It is a question of a discussion that is made, that goes on between OMB and the department.

Mr. SIMPSON. I have asked—in fact, I have——

Secretary BODMAN. And out of that comes a single budget.

Mr. SIMPSON. You see, Some secretaries have given it to me, and some said they couldn't. Some say that I have to get it from OMB.

Secretary BODMAN. I see.

Mr. SIMPSON. The reason I ask that is not because I am trying to put any pressure on the department or on the administration or

anybody else. It is because if this committee decides to have an allocation in Energy and Water of more money, I would like to know what the professionals within your department thought would be the place to spend it. That comes from looking at the original request and what you thought was important and where it was cut back because of your negotiations with OMB.

I know that goes on. It has to.

Secretary BODMAN. Sure.

Mr. SIMPSON. They have a responsibility to try to balance the budget. I am not trying to jump on their case or on the department's case. I just want to know what the department felt was the appropriate funding when they originally made the request.

Secretary BODMAN. We would be happy to work with you, sir, on that as a general matter. But I am not going to give you the specifics of whatever budget proposal we made to OMB.

Mr. SIMPSON. Interesting. You don't want Congress to know too much. It might be dangerous.

Secretary BODMAN. Well, it is not a matter of that. There is one budget that comes out of the administration.

Mr. SIMPSON. I know that and I know you have a responsibility to defend it. I am not saying that if you give us the other stuff, you are not defending the president's administration, because part of the total budget process is determining what the bottom line is going to be. You don't do that. OMB does that. We understand that.

Secretary BODMAN. That is correct.

Mr. SIMPSON. But we don't have to follow OMB.

Secretary BODMAN. I understand that.

Mr. SIMPSON. We have other responsibilities also.

Secretary BODMAN. I understand that, but I do.

Mr. SIMPSON. I know that, but all I am saying is we have other things. If you want us to act in an intelligent way and make intelligent decisions, we need to have access to what the professional people within your department think.

Secretary BODMAN. And I would be happy to provide that to your staff if you would like that.

Mr. SIMPSON. Yes, I would like that.

Secretary BODMAN. All right, let's do it.

AFCI FUNDS

Mr. SIMPSON. Let's go back to another question that has come up. I am curious about the language that was in the omnibus appropriation bill that says the department is directed to make 50 percent of the AFCI funds for research and development in an agency-wide solicitation for universities, national laboratories and commercial entities, and we were supposed to have a national competition for that.

There is $180 million, $30 million of which was earmarked for hot cells. Of the remaining $150 million, the language directed $75 million of it to be competed.

Secretary BODMAN. Right.

Mr. SIMPSON. If I have this correct, one-third of the year was over by the time the language was passed by Congress, so if you

spent on a steady line, you have spent about $37.5 million of that by the time the language comes out.

Secretary BODMAN. Right.

Mr. SIMPSON. Leaving $112.5 million, and now $75 million of that has to be competed. How long does it take to complete a process of deciding how you are going to go about the competition, get the competition done, and so forth, so that you could actually compete it? Because what I am wondering is——

Secretary BODMAN. It takes 6 months.

Mr. SIMPSON. So if you started the day that the appropriations passed, we are into three-quarters of the money being spent if the programs that are already being funded are done.

Secretary BODMAN. That is correct.

Mr. SIMPSON. So there is not $75 million left. So essentially, you are going to have to start de-funding some of the programs that are going on currently right now, or stop those programs, in order to save the $75 million to be competed in the last quarter of the month.

Secretary BODMAN. That is correct.

Mr. SIMPSON. And that is the problem the department has with being able to do it?

Secretary BODMAN. That is correct.

Mr. SIMPSON. I understand the differences between the committee wanting to get something done and just saying "do it," and the department having the difficulties of doing it.

Secretary BODMAN. It just takes a while. It is not that there is an opposition to competition. There was a genuine sense that the universities, the national laboratories and private industry would each be competing among themselves because they were doing different work. The staff of this committee held and said, that the committee explained to our staff that the committee felt otherwise; that the committee felt that it ought to be an across-the-board competition, so we had to start over. So starting over adds more time, but we have attempted to do that, sir.

Mr. SIMPSON. Have you started?

Secretary BODMAN. There is not an intention to subvert the wishes of this committee.

Mr. SIMPSON. Have you started to put out proposals, or are you in a process like that for the competition or anything?

Secretary BODMAN. We are going to be several months away before we put out proposals and ask for—that is what takes a while.

Mr. SIMPSON. Have you notified those programs that currently are spending money under the AFCI that they are going to be defunded or funding is not going to be available because you are going to have to reserve $75 million of that for competition?

Secretary BODMAN. No. The answer is no.

Mr. SIMPSON. But that will be coming, won't it?

Secretary BODMAN. It presumably will be.

Mr. SIMPSON. Do you know what that means in terms of layoffs at those facilities that are currently operating?

Secretary BODMAN. It is going to be substantial. I don't happen to know off-hand. We are trying to avoid doing something dumb like stopping funding for something that is going well.

Mr. SIMPSON. I understand that. And I understand there is a difference between what the committee and we have put in the report language, and what is able to actually get done.

Well, I want to work with you and see if we can resolve those differences so that we don't disrupt work that is continuing, and still try and meet the intention of the committee that we have some competition out there for that. It may be that some of that competition has to move into next year and into the next year's budget.

Secretary BODMAN. I think that is where it is going to be, but we will do our level best to try to accomplish that which is the intention of this committee.

Mr. SIMPSON. I appreciate that.

ENVIRONMENTAL CLEANUP

The EM budget—as you know, some of us have some real concerns with it and the amount of money for cleanup, particularly at sites that have been successful like Idaho and Oak Ridge, is down. And with last year's budget and again this year, it almost seems like the more successful you are, the more you are going to get cut the next year.

Secretary BODMAN. That is not the intention.

Mr. SIMPSON. I know, but it is the result.

Secretary BODMAN. Well, I think that where we have been successful, that means we have accomplished something and that means that there is less threat to the environment and to the people who live in and around there, as opposed to things like Hanford, which is the issue that I think Ranking Member Hobson mentioned before. At Hanford, there is the risk of getting chromium and other very serious matters into the Columbia River that flows right by there. I mean, that is the issue. How do we stop that? And so we have turned our attention more to that than to the so-called accounts.

Mr. SIMPSON. Certainly, though, it creates uncertainty within the various cleanup projects around the country, and you are looking at employment and trying to maintain a steady workforce to do the cleanup responsibilities that they have. What does the reduction in the EM budget do to meeting the milestones of the state agreements that the DOE has? Are you going to have to renegotiate any of those agreements?

Secretary BODMAN. I am sure we will. Furthermore, there is a reduction in some 200 jobs that will be in Idaho. Had we just applied that $70 million across the board, I think it would have been something like, I am told, 400 or 500 jobs. So this would save some 300 jobs—500 minus 200—of highly qualified people that will continue the work in this endeavor. But we will defer the construction project, the salt waste-bearing project, by a couple of years.

MILESTONE AGREEMENTS

Mr. SIMPSON. What does it do to the milestone agreements between DOE and the state? Because it has always been—for those people that are opposed to the Idaho Lab or opposed to anything nuclear always use that as their banner—that DOE doesn't meet

its milestones. Quite frankly, they have done a pretty good job. What is it going to do to the milestones in the future?

Secretary BODMAN. I don't have that answer off-hand, but I would be happy to get it for you. I can give it to you in total. We are going to miss in 2009 about 32 milestones. About two-thirds or three-quarters of those, I think 23, are due to the budget numbers that you see there. But we are going to have 10 or 11 that would be there anyway.

Mr. SIMPSON. Is that the issue?

Secretary BODMAN. Yes, sir. And in 2008, it is some 16 milestones that we will miss. Again, it is about two-thirds or three-quarters—I think it is 12 of those that are budget-related in the 2008 budget.

Mr. SIMPSON. Is the DOE paying fines and penalties for missing any of the milestones? Are any of the agreements imposing those?

Secretary BODMAN. Yes.

Mr. SIMPSON. How much are we paying in fines?

Secretary BODMAN. I don't have that answer, but I would be happy to get it for you.

ENVIRONMENTAL MANAGEMENT MILESTONES

Fines and penalties are typically addressed in our agreements with state and federal regulators. Where fines and penalties were allowed, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed. From the beginning of fiscal year 2006 to the present, there have been four instances in which fines have been imposed for missed milestones. Three of those have been at Los Alamos, one for $345,000 that was paid by the contractor, one for $405,000 that DOE paid, and one that is still accruing for a milestone due in November 2007 that has not been completed yet. The fourth instance was at Hanford, where DOE paid a $75,000 fine in January of this year for missing two milestones related to the K Basins, but is seeking reimbursement from the contractor.

Mr. SIMPSON. Because it seems like we would be better to plus-up the EM budget to the extent we could to try to meet those milestones, rather than paying penalties along the way.

Secretary BODMAN. I agree with that.

Mr. SIMPSON. I guess that is one of the things that bothers me about not being able to see what the DOE originally wanted in terms of budget. OMB comes in and sometimes they don't know what they are doing, more frequently than not.

Secretary BODMAN. If I may say, the question that ought to get asked is how much money does it take to avoid missing these milestones in 2009.

Mr. SIMPSON. And that is an excellent question.

Secretary BODMAN. That is the operative question.

Mr. SIMPSON. Can you give us that information, of what your estimate would be?

Secretary BODMAN. We are working on that number.

Mr. SIMPSON. Do you have a flow chart where you take all of the waste within the DOE complex and where it is to be disposed of? Do we have the capacity to dispose of it at those locations? What is the timeframe for doing that? What is the cost of doing that? Do you have a flow chart that outlines all that kind of stuff?

Secretary BODMAN. We have reports. I don't know that we have a flow chart that summarizes that in that fashion.

Mr. SIMPSON. I am a picture guy. I would like to see that so I can wrap my mind around what some of these things are in the

future and how long we are looking at, and frankly whether we have the capacity for all the storage that we are going to need.

MILESTONES SUMMARY

We have complex-wide management plans and process flow diagrams for the various waste types resulting from our cleanup programs. The data are derived from our project baselines, provide life-cycle estimates, and are updated annually. The Waste Information Management System (WIMS), which generates waste life-cycle disposition maps for the Department's low-level and mixed low-level radioactive waste, is available on the Internet (http://wims.arc.fiu.edu/WIMS/).Later this year we will add transuranic waste data to this system. Currently, the disposition maps cover a timeframe through 2050. EM's validated baselines include summary-level costs for the out-years, which includes costs for disposal of waste. These cost estimates vary but in recent years have been approximately 15 percent of EM's total annual budget.

We currently have adequate capacity to dispose of the majority of our low-level, mixed low-level, and transuranic waste at the Department's disposal locations. We also utilize commercial disposal facilities for some low-level and mixed low-level wastes. Those waste streams that are without a disposal path today are well known and we are actively working to identify disposal options. My staff can work directly with the Committee staff to determine the best way to demonstrate WIMS and provide additional complex-wide process information.

Secretary BODMAN. The ultimate issue is that we are going to need Yucca Mountain. That is really what this comes down to.

Mr. SIMPSON. Sure.

Secretary BODMAN. Mr. Hobson just said, we are not going to have Yucca Mountain.

Mr. SIMPSON. Then we are in big trouble.

Secretary BODMAN. Well, what we can do is to, on Yucca Mountain, our commitment is even with the $100 million reduction in funding that we got from Congress, we are committed to filing an application for a license with the NRC this year. We will hope to do that.

The other issue I would raise is that it is not just important to file. It is also important to get it docketed, that is to say to have the NRC say that the application is sufficiently complete that it can be evaluated by the NRC. That is a process called docketing, meaning that they will put it in their queue and manage it as such. So that takes a matter of months afterward. We would like to get all of that done on our watch if that is possible. But we are committed to file the license application this year.

DOD LIABILITIES

Mr. SIMPSON. Trying to put everything in its proper place, like EM stuff within EM, and NE stuff within NE, there is a proposal to transfer liabilities for DOD responsibilities that are currently under NE to EM. Are we moving along with that process? Is that going to get done? I know just transferring the liabilities doesn't mean anything if you don't transfer the money to actually do the cleanup.

Secretary BODMAN. I don't have an answer. I don't know that. I would be happy to get you that.

LIABILITY TRANSFERS

The Department began the process last year of determining the appropriate transfer of environmental liabilities between DOE program offices by requesting nominations from the Office of Science, Nuclear Energy and the National Nuclear Security Agency. These program offices have nominated materials for transfer, including

spent nuclear fuel and some radioactive materials, in conjunction with excess contaminated facilities. This is a complex issue involving many of the Department's offices in addressing the requirements to handle these materials. The Department plans on taking a corporate approach to address these liabilities during the FY 2010 budget formulation process.

Mr. SIMPSON. One last question.

Secretary BODMAN. Yes, sir.

PROJECT MANAGEMENT

Mr. SIMPSON. Project management.

Secretary BODMAN. Yes, sir.

Mr. SIMPSON. Every year we complain about DOE being on the GAO list of inability to complete on-budget, on-time any major projects. I understand some of the issues are relative to the fact that you have projects that are sometimes big and complex and unknown, like the waste treatment plant in——

Secretary BODMAN. It is also that they are one of a kind.

Mr. SIMPSON. Yes, one of a kind.

Secretary BODMAN. That is the problem.

Mr. SIMPSON. And that makes them very difficult. But what are you doing within the department to try to get off the GAO list of worst-performers? What are we doing to try to make sure that we do a better job?

Secretary BODMAN. We are working with the General Accountability Office, with GAO. They have given us five criteria that they view as important. One is leadership. That is to say that the leadership of the department understands the importance of project management. Two, that there is an effort related to continuous improvement. Third, that there is a root-cause analysis of what the problem has been. Fourthly, that we have a program for staffing, increasing the staffing capacity. And fifth is results—that it works.

Those are the five things. Of those, as I understand it, they have given us good marks on the first two, that we have strong commitment of the leadership of the department and that we have seen a continuous improvement in our project management skills.

We have a root-cause analysis, a report which is due out next month. That will lead to the fourth, namely increases in staffing. You will notice that there is an increasing in staffing required, or that is proposed to the Congress in the 2009 budget. We believe that this will lead to improved results, so that over time we can see our way clear to getting improvements.

I think we are on a path, notwithstanding the doubts that were expressed by the chairman and the ranking member as we began. I believe that we are on a path of, if not getting off the list, and frankly, our folks met with OMB and concluded we are never going to get off the list, but that is sort of a fixation in their mind that we are there forever. But I do believe that we will see very significant improvement in the results that we have. I believe that we are on the right path.

When I got here, most of the people who were running these very large one-of-a-kind projects weren't even certified as project managers. They hadn't been trained. It wasn't their fault. We do have standards now and they are trained. We have programs now and we are getting these people trained and focused and on top of it.

So I feel much better personally about this than was expressed by the ranking member and by the chairman in their opening remarks.

Mr. SIMPSON. Thank you.

Mr. VISCLOSKY. I am going to recognize Mr. Rehberg.

I just want to follow up for 1 second. I regret, and I think Mr. Hobson does, that you don't have enough money this year for Yucca. Obviously, the House position was different. We had a conference and it is what it is, because for all of the disagreements that were expressed. That is not your burden. It is all of our burden.

Secretary BODMAN. Yes, it is.

WATCH LIST

Mr. VISCLOSKY. There were not enough monies expended, and I certainly regret that. It is what it is.

Because I want to get to Mr. Rehberg and other members who haven't asked, but on the issue of the watch list, and I would also acknowledge that as far as the certification process, the Department has made progress, and GAO suggests that is the case. But I would point out the department has been on the watch list since 1990. If there is a watch list, there must be some way not to either ever be on it or to get off of it, and I am assuming there are other departments that are now off, and if there are criteria that the department is following through on to improve management.

I would acknowledge that have been improvements, that there ought to be additional efforts to continue to improve because somehow yourselves and I assume other agencies have made it onto that list—in this case back in 1990—because of all these criteria that are formulated for that list, at some point there is a way to get off.

Secretary BODMAN. I hope so.

Mr. VISCLOSKY. And sooner rather than later after 18 years.

Secretary BODMAN. Thank you. I remain ever hopeful that that will be the case, and we are working as hard as I know how to work in order to try to bring about improvements of the sort that you alluded to. These were the five criteria—leadership and continuous improvement.

Root-cause analysis, that report will be due out. That is to say, we are looking hard at how did we get here and what were the real causes of the box we find ourselves in. Then it is really staffing and training, so the capacity of the staff to function. And we have money in the budget to increase that focus.

And then lastly, results. Are the projects coming in? We have, for example, in the last 2 or 3 years, we have brought 70 percent of our projects into completion within 10 percent of the cost. That is the goal that use. CD–2 is the time that we make the decision and we lay the baseline for what the cost is. That is at the beginning, and in 70 percent of the cases we are bringing in our projects to completion—this is over the last 3 years—within 10 percent of budget.

That is pretty good. I mean, at least it is much better than it has been in the past. It is not 90 percent and it is not 95 percent, but it is 70 percent. It is a lot better than 20 percent or some number that is significantly lower.

Mr. VISCLOSKY. Mr. Rehberg.

Mr. REHBERG. Thank you, Mr. Chairman, and thank you for helping me in my endeavors to make the committee healthier, and for pointing out the level of intelligence of people moving from Montana to Washington to work.

I might point out that I made the top half of the class possible in Montana. If it hadn't been for me, she would not have been "summa" anything.

And congratulations to you. I have never served on a committee where we have 100 percent attendance, so you must be doing something fairly controversial.

Secretary BODMAN. It has to be controversial.

FUTUREGEN

Mr. REHBERG. It seems to be a lack of support, I think, but it is noticeable. Obviously, my concern—and we don't need to talk today about the things that are going right within the department. I am sure there are one or two, but we need to talk about the areas where we have differences.

Obviously, my biggest difference is what has happened within the FutureGen program within the Department of Energy. As I look at the decision that was made, it kind of reminds me of why I am glad this Department of Energy didn't have anything to do with NASA because the department would have divided NASA up into five or six different little missile programs within individual states and said, "go forth, young guys, and see if you can compete with the Russians and good luck."

We have a program that is in place. The FutureGen Alliance is working. We have quite a number of private entities who have invested a lot of capital. We have dealt with India and China. We have had a lot of excitement about FutureGen. We finally went through the selection process. We found a site in Mattoon, Illinois.

Everybody is kind of focused on the ability to share technologies with foreign countries. I have never seen a level of cooperation quite like this, and I am a businessman by trade. Obviously, I have not been in government all my life. It was a pretty exciting private-public partnership.

And you guys really threw some cold water on the project. What business model or what brainiac sitting within the department has made the determination that it is better to divide it up and to lose all this cooperation and go contrary to what some of the best minds, who happen to be in the utility industries throughout the country, are saying is really a stupid thing, in backing off and delaying.

Before I have you answer that question, I just want to read something that was actually in my local newspaper today. This is in Great Falls, Montana: USDA pulls plug on Highwood financing. You don't know anything about Highwood, but it is a coal-fired generating plant that does not have sequestration.

Secretary BODMAN. This is USDA?

Mr. REHBERG. USDA. We would like to have sequestration of some components. You see, what they are doing is they are looking for RUS, which is Rural Utility Service funding for the project, and the Bush administration made it clear that none of the money that

has been appropriated through the Department of Agriculture for the RUS, which is $7.1 billion, none of the money can be spent on new coal-fired generating plants nor nuclear plants.

I could make that argument with the Department of Agriculture and the Bush administration, aside from you, but let me just read what it said in the paper just today: "The financing development for the Highwood project comes amid increasing scrutiny nationwide of public and private financing for coal-fired power plants. Earlier this week, a Cambridge, Massachusetts-based company called Synapse Energy Economics, which provides regulatory advice to private and government institutions, released a report blaming skyrocketing construction costs"—which will now even be exacerbated by your department's decision to change directions—"skyrocketing, regulatory uncertainties"—which is further exacerbated by your lack of ability to get the record of decision out on NEPA since December, which we are still waiting for that—"and environmental concerns making investment in coal-fired power plants less attractive." The report said 20 coal-fired power plants were cancelled in 2007, and three dozen more were delayed.

So again, I ask you then, under what business model, who has come up with the concept that we have been trucking along, everybody is cooperating, everything is going just fine—there are some delays, but frankly some of them are created by your department—why the change?

Secretary BODMAN. The change, sir, was done initially because of the increase in cost of the FutureGen project, which went from $950 million, and that was the number that was there when I arrived, it increased to $1.8 billion and was going, in my judgment, up from there for the reasons that your newspaper just alluded to.

We also had changes in the marketplace. A number of states—Florida, Kansas, the State of Washington—have declined permission for utilities to build coal-fired power plants without carbon sequestration. We looked at all of that and looked at the fact that there seemed to be more interest in IGCC—integrated gasification and combined cycle—projects than there had been before.

And therefore, we were on the hook for three-quarters of that money, of the $1.8 billion—about $1.3 billion or so. I didn't have $1.3 billion. The idea is to try to work with the utility industry in order to develop two or three separate carbon sequestration projects where that is where the money would go. So they would put the money up to build an integrated gasification combined cycle plant, and we would——

Mr. REHBERG. The difficulty when you talk about the utilities——

Secretary BODMAN [continuing]. And we would spend the money on the CCS.

Mr. REHBERG. But you have the utility companies—the big guys in the program—telling you that is not the direction to go. So yes, maybe the State of Florida and its government is saying they don't want it built, but the utilities are saying you are killing us out there because we finally get to the point where Texas and Illinois were willing to work with their legislatures to get their laws changed, to work with their environmental community, to work with all the entities that would be involved to have it located at

their site—they finally get it done, and you take the legs out from under them, and then tell them to go out and stand on their own two feet. And they just can't do that.

FUTUREGEN

Secretary BODMAN. That particular project, sir, involved not just CCS, but involved an advanced system of first adding steam to the gasified coal, separating out the hydrogen using a metal filter, if you will, that would allow the hydrogen to move out and to maintain the carbon behind, and then to sequester the carbon dioxide following that. It involved a lot more than just CCS.

Mr. REHBERG. The difficulty is when you finally come to a point where you are able to monitor the emissions from whatever plant, it would make a determination as to whether it is environmentally acceptable, wherever you are doing it—whether it is in a stream or whether it is internally. Don't kid yourself. Now that we have gone down this path and we have identified a near-zero emissions opportunity using the technologies within FutureGen, if you can come up with any technologies and support any technologies, short of what we know, you have just created another opportunity for a court case.

Secretary BODMAN. I guess I would respectfully differ with you. I think that where we are focusing strictly on CCS and sequestering the carbon dioxide, and that we do it in two or three different geologies, rather than just doing it in the state of Illinois, but the state of Texas or wherever, that we are better off. We learn more and we get it done faster.

Mr. REHBERG. Why would any business trust the Department of Energy and want to go into any kind of a public-private partnership if 5 years down the road, they are moving along, they have worked with the legislature, you have this huge effort, and then you change directions and say, "oops, you know, we just don't like the cost."

Again, let me ask you, where is the record of the decision? We are waiting. It is sitting over in your department. It was due mid-December.

Secretary BODMAN. We do not plan to issue the record of decision.

Mr. REHBERG. This goes back to Representative Simpson's point. Once an agency decides they don't want to do something, they just don't do it, thereby stopping it in a different way. So even if we were to try and overcome the president's objections, there will be impediments in the way because you are not going to release any record of decision, which is integral to the continuation of the FutureGen program.

Secretary BODMAN. As far as I am concerned, sir, we have altered the direction of FutureGen along the lines that I have already alluded to.

Mr. REHBERG. That is distressing.

Thank you, Mr. Chairman.

Mr. VISCLOSKY. Mr. Rehberg, I come from Gary, Indiana. We don't have coal in my congressional district. We have a lot of it in the state. We use a lot of it, between five integrated steel mills and an oil refinery. We use carbon. And so I am a strong advocate of

research as far as how do we unlock the BTUs in coal and how do you capture and sequester.

I would make the observation, and it was during a hearing last year when you were not on the subcommittee. We had a member of the department come up, and I do remember, all kidding aside, we had to pull Mr. Simpson back off of the podium when the gentleman persisted in suggesting that the cost of this program had not gone up past $950 million—and he said it about three or four times, and of course, he is no longer with the Department of Energy—in constant dollars.

There was a subsequent communication to the subcommittee that the actual cost was now about $1.7 billion going north. And that this could not go on forever. Even without getting into particulars, it is also my sense—and I am not saying everybody has clean or dirty hands here—that it takes two parties here, and whether or not the alliance itself was willing to be flexible and to look at the realities of the situation that they faced.

So I am not in disagreement with the decision that the Department made. How the Department proceeds obviously is something that we will have to continue to pass judgment on and monitor.

Mr. HOBSON. You were not always negative.

Mr. VISCLOSKY. No, and I do feel compelled because when we disagree, I certainly make it known, but in this case I do think the department acted appropriately because the costs of this project had gone out of control, and to get results on the coal side.

Mr. REHBERG. And I entered into this knowing of your position. I followed the media coverage during the process. The difficulty is, it is the same parties that we are going to ask to cooperate in the future. And frankly, I wouldn't want to do business with this department for these reasons. It is a level of credibility, and once you destroy your credibility, you never get it back. This is just one of those examples.

I just happened to be in the real estate development business. The costs are killing us out there for construction costs. So I have some sympathies for the companies as well. They are looking at decisions that the federal government is making on things like asphalt, which is directly tied to crude oil, which is something that they have to pay for.

So in looking at the complexity of it, it cannot be made from a regulatory, bureaucratic position because these are companies that are out there having to try and produce something for their customers at a reasonable price. In my particular case, the Highwood plant is 60,000 of my Montana households. It is five rural utilities in Great Falls, which is the third-largest city in my state. Are they going to be without power as a result of a decision at the Bonneville Power Administration in 2012?

So any delay is going to create a crisis. So yes, maybe $1.8 billion sounds like a lot and going north, but that is just life right now, based upon what we are paying for natural gas and for crude oil and all the other things that go into construction costs. So I am not sure we can necessarily blame the companies or pass that cost on to the companies because ultimately it is a bigger decision being made by the federal government to be so dependent on foreign sources for our energy and such.

So any delay, whether it is 1 year or 5 years is going to have a substantial impact on people in homes, and I am going to be sitting before you and asking for more money for LIHEAP, or going over to Labor-H and asking for more money, because they just will not be able to afford their home heating costs.

Mr. VISCLOSKY. I appreciate that.

Mr. REHBERG. Thank you.

Mr. VISCLOSKY. Mr. Ryan.

DUF6 PROJECTS

Mr. RYAN. Thank you, Mr. Chairman.

I have a couple of questions, and I am going to be brief because I have to get to another hearing, but I am a rookie here so the chairman saved me for last.

One of the issues is one of these DUF6 projects in Portsmouth, Ohio. There is one in Paducah and there is one in Portsmouth.

Secretary BODMAN. Right.

Mr. RYAN. If you could give us an update on it. There have been a lot of notices with cure notices, baselines changed, and we are not obviously getting the kind of production down there that we want.

Secretary BODMAN. Yes, sir. We have two due dates. One I think is May or June of this year. The other, the new date is now December of this year for the two plants. I think the first is in Portsmouth and the second is in Paducah, or vice versa. We have had enormous difficulty bringing the contractor to heel, if you will, to get them to commit to it. All I can tell you is that those are the dates that are now given to me. If you asked me how much do you believe them, I would tell you I think we are probably going to slip it even beyond that by 3 or 4 months.

CONTRACTORS

Mr. RYAN. Let me ask you this question. What do you do with these contractors? Is there anything that you are doing as far as having them on some kind of list? Because what the problem is, they keep backing us up on a project like this, and then they end up getting other contracts to do other things. It seems to me that——

Secretary BODMAN. All can do is to try to prevent them from, for example, if they were committed to operating this facility after constructing it, then you could raise the question of should that happen. I will tell you that that issue has been raised and is under negotiation.

Mr. RYAN. How about constructing another facility at some other time?

Secretary BODMAN. Same idea——

Mr. RYAN. But is there a formal process that you have in place?

Secretary BODMAN. I don't know. I would be happy to look at that and sit down with you.

Mr. RYAN. I yield to my friend.

Mr. HOBSON. It is how you write contracts, too. One of the things that is a problem in contracts generally from agencies is that their penalty clauses are not good. I am not blaming you for this personally.

Secretary BODMAN. I understand.

Mr. HOBSON. This is a problem with how we draw up government contracts. There is no real penalty people for exceeding the contracts, and there is no penalty in the future to them for exceeding contracts. That is what I hope someday that you will get at before you leave is how you draw contracts. It is not good. It is bad in the Department of Defense. I mean, it is terrible in the Department of Defense. It is outrageous. Yours is easier to fix, I think, but nobody reads them until there is a problem and the taxpayer loses.

Secretary BODMAN. I will look at it.

Mr. RYAN. I appreciate that.

Secretary BODMAN. Yes, sir. And we will respond to you in terms of the questions you asked.

RENEWABLE ENERGY

Mr. RYAN. I know Senator Brown has been very involved in this, too. I mean, this is a major issue for southern Ohio, so we want to make sure this doesn't happen anywhere else.

We have a couple in northeast Ohio, a few General Electric plants, that are closing down, moving, due to the whole China incandescent light bulb situation. My question is, because I look at your zeroing out of the renewable energy production incentive, have you ever met with the CEO of General Electric or anybody from General Electric to just sit down and say, hey, what can we do to help you stay here in the United States, to be competitive here?

I mean, the whole debate going on now in the presidential election, you know, we are talking about NAFTA from 1993. But those of us who represent these areas, we need to plug these areas back in. And a lot of people say, well, that is globalization. Half of the country is missing out on the boat here. I just want to know if you have done anything, or your office has met with a major——

Secretary BODMAN. I met with the head of nuclear power at General Electric and talked to him on exactly what can we do to be helpful. He has given me his views.

Mr. RYAN. Is this constructive—the zeroing out of the renewable energy incentives? Wouldn't that be a part of any kind of long-term——

Secretary BODMAN. When you say "zeroing out" of the——

Mr. RYAN. Renewable energy production incentive—100 percent cut from $5 million in 2008.

Secretary BODMAN. I don't know what that number is.

Mr. RYAN. I mean, this is kind of a philosophical thing. Are we going to do everything we can to help keep these companies here, especially if they are going to stimulate new production and new ideas here in the United States. It seems to me to cut that, it seems counterproductive.

Secretary BODMAN. I don't have an answer to that. I would be happy to get it for you.

RENEWABLE ENERGY PRODUCTION INCENTIVE

The Renewable Energy Production Incentive (REPI) provides financial payments for electricity generated and sold by new qualifying renewable energy generation facilities. Since FY 2005, the average annual appropriation for REPI has been about $4.9 million.

The incentive value of REPI has diminished over time as renewable energy technologies have reduced in cost and become more competitive. Other factors, such as state initiatives and policies like Renewable Portfolio Standards, have further reduced the value of this program. The growing pool of eligible applicants has resulted in increasingly smaller amounts which can be paid out, given the limited availability of funds to distribute.

In addition, REPI participants are eligible for Clean Renewable Energy Bonds (CREBs) which stimulate new renewable electric capacity by reducing finance costs and therefore make projects more cost-effective. In 2006, the Internal Revenue Service reported that borrowers submitted applications for about $2 billion to finance 701 projects with an average project size of $2.9 million. Such projects can have a significant local economic impact.

Mr. RYAN. Is there a plan that you have long term? I mean, obviously you are in your final year here, but is there some kind of strategy from the executive side to say, hey, what can we do? I mean, we do this in the local community all the time. If a company talks about leaving, you get the county commissioners, you get the state delegation, you get the state incentives, and you say what can we do to keep you here. It seems like we are not getting that same kind of initiative at the federal level.

Secretary BODMAN. Our focus, frankly, is on the science, on the environmental management. As I have described this department, we are the nerds of the federal government and I am the chief nerd. We develop processes. We develop equipment. We don't do it perfectly. We are well behind where we should be in project management, as you have heard. But that is what we do. That is what we are good at.

It is the Commerce Department, it is the Labor Department, it is others who work on specifically that area that you just alluded to. It is not something that the Energy Department does. Maybe we should, but we don't.

Mr. RYAN. If you are working with GE, and you see the commercial all the time—desalination. They are doing this, they are doing that. I mean, it seems like you should be involved in this to help steer this company back to where they have been for 100 years. I am not a dinosaur. I understand what the global economy looks like, but they are going to do this somewhere, and if they feel like they have a partner with the Department of Energy, I think it would be a little more productive.

ENERGY EFFICIENCY

I have one final question, Mr. Chairman. With schools, we had the Secretary of Labor on our other subcommittee a few days ago, and we were talking about making these schools energy efficient, almost using the schools as a laboratory for these kids to understand long-term, and even work on some projects with the schools. She mentioned a program in the Department of Energy. I haven't had a chance to do any research on it.

Secretary BODMAN. We do have such a program.

Mr. RYAN. What is that program like? Do you know what the funding is and what is the basic mission?

Secretary BODMAN. The funding is of modest size—that is to say it is a few million dollars, I believe. For example, I was down in the city of New Orleans. We have announced our availability to help with the design and construction of any new building or any addition to current buildings, so that they can be more energy effi-

cient. The Secretary of Education and I visited a facility over here in Virginia.

This is an important matter that we pay a lot of attention to, namely energy efficiency. We do have a buildings program within the EERE.

Mr. RYAN. There is not a whole lot of money in that, though.

Secretary BODMAN. No, but there is some. The idea is to develop building designs that are more accepted on a broader basis. I was in Orlando the week before last, where we announced a charge to the homebuilders of America. It was the National Association of Home Builders. There again, they are undertaking—I think we now have a commitment to build 200,000 homes over the next 4 or 5 years to standards that are much more energy efficient than they have been in the past.

So we are doing everything we know how to do within the constraints of finances. We have even had a marketing effort, believe it or not, within the department and have spent $1 million, for which we have been criticized by some members of this committee. But we have focused our attention on buying television time. Disney had the movie Ratatouille, and I think "Louie" was the rat that wanted to be a chef. For those of you who are young enough to have children——

Mr. SIMPSON. [OFF MIKE]

Secretary BODMAN. Well, I have never seen it, but I can tell you that, anyway, the rat is in the cartoon and he is trying to convince the kids of America to get their parents to buy compact fluorescent lights; the idea being that if you install compact fluorescent lights, they are efficient and they work. They help save energy and they are more efficient. So we even have a modest marketing effort. We are doing everything we know how to do.

WEATHERIZATION

Mr. RYAN. I don't know if I agree with that, because I have heard some of the comments here today and read through the budget a little bit. I think the weatherization stuff—that is critical stuff. That is not to be taken lightly.

Secretary BODMAN. I understand.

Mr. RYAN. I understand. You say that is $1.50 for every $1 you spend?

Secretary BODMAN. It is $1.50 for every $1 we spend, and it is $20 for every dollar we spend on our research programs, we think.

Mr. RYAN. What does that mean? I don't understand that—$1.50 for what?

Secretary BODMAN. It is the rate of return that we get, that the country gets, from both the research effort and——

Mr. RYAN. What is your process? What is your formula for determining that?

Secretary BODMAN. The study of the research programs is done as a result of work of the National Research Council, who evaluated the research programs.

Mr. RYAN. I would like to see that, because that is mind-boggling to me because there were 80-some thousand families who will qualify this year for the weatherization from last year's budget, or something like that, and to cut their energy costs by one-third, that

is a significant amount of money. If you take 80,000 households and cut their energy bill by one-third and it is only a few million bucks that we are spending.

Secretary BODMAN. I would be happy to get you the numbers.

Mr. RYAN. I would be happy to look at that. All right.

Thank you, Mr. Chairman.

Mr. VISCLOSKY. Thank you, Congressman.

Mr. RYAN. Thank you, Mr. Secretary.

WEATHERIZATION INVESTMENT RETURN

The 2005 Oak Ridge National Laboratory (ORNL) metaevaluation on the Weatherization Assistance Program ("Estimating the National Effects of the U.S. Department of Energy's Weatherization Assistance Program With State-Level Data: A Metaevaluation Using Studies From 1993 to 2005," ORNL–CON–493, September 2005) found first-year per-household energy savings for gas heated homes averaged 30.5 million Btu. Using natural gas price projections from EIA resulted in an energy savings benefit/cost ratio of 1.34. Based on updated price and cost data for 2006 and 2007, ORNL calculated the current benefit/cost ratio of 1.53 for the Weatherization Assistance Program. The metric of a 20 to 1 return on R&D investment was derived from a National Research Council study ("Energy Research at DOE: Was It Worth It?" National Academy Press, 2001).

Mr. VISCLOSKY. I am going to proceed. Mr. Simpson, if you at any point have questions yourself or want to jump in, please do. Mr. Hobson and I both have a defense hearing he is going to go to now.

WHISTLEBLOWERS

Mr. Secretary, I have a couple of questions on whistleblowers. Last year, we had a series of questions and you did answer for the record very specifically, and I appreciate that. But I will read from last year's record, and this regards whistleblower litigation: The Department of Energy has reimbursed contractors $7,983,956 for the cost of defending litigation by whistleblowers in the last 5 years, from October 1, 2001 through September 30, 2006. During fiscal years 2002 through 2006, DOE made three reimbursements for whistleblower cases in which the judgment was in favor of the plaintiff. In those instances, DOE reimbursed contractors $350,489. During fiscal year 2002 through 2006, DOE contractors reached settlements with plaintiffs in 19 whistleblower cases before a final ruling. In those instances, DOE reimbursed contractors $4,523,073.

There was reference made to Title 48 of the Code of Federal Regulations, 931.205–47(h) which at (2)(iii) requires a contracting officer to determine allowability of defense settlements and award costs on a case-by-case basis, after considering the terms of the contract, relevant cost regulations, and relevant facts and circumstances, including federal law and policy prohibiting reprisals against whistleblowers. And then it continues.

I have a question for the record asking for an update as far as the costs of reimbursement to contractors. The policy issue I have, and particularly given the code of federal regulations that talk about this being case by case, whether the Department of Energy or any other department or institution, public or private, at times there are things that are untoward that occur, particularly in some of the programs that DOE is involved in where you have huge safety issues, health issues, public policy issues.

Secretary BODMAN. Cyber-security issues.

Mr. VISCLOSKY. Cyber-security issues. I alluded to it with Mr. D'Agostino last year in an NNSA hearing, where one of the managers said, "If I was doing it, there would be blood on the floor." Of course, in the end, there was a jury award of over $4 million for the employee, but the attitude was "you told on us, you told on us."

I have a concern about where the loyalties lie, in that if something has gone wrong and it is brought to light, I would hope that the first impulse of people is that, well, one, if it is in fact true, we should investigate whether it is, or potentially you have a disgruntled employee. If it is, we ought to correct the problem, as opposed to "you are gone."

The concern I have, and I appreciated the answer last year, is if the government is reimbursing the contractors, where the contractors are settling with plaintiffs because of employment actions or jury awards, what is the incentive for the contractors at DOE to behave themselves, if we as a government and taxpayer are going to reimburse them to pay plaintiffs to settle cases?

From a policy standpoint, I find that a very troubling policy. I can see even—and I am not saying I would support it—but reimbursement for litigation if in fact there was no substance to the claim. But where you have had settlements, where you have had jury awards, and then the government reimburses as a business expense the contractors, I am troubled by the policy. And it is not just at DOE, but it is obviously within your jurisdiction.

Secretary BODMAN. I am, too. I don't have an answer for you, sir, other than saying that I, too, share your concerns. I think it is important to try to protect whistleblowers. I do know that I get inquiries made of me by disgruntled employees, and I as a rule make it a program to investigate in so far as discussing the nature of the issue and of the complaint with the under secretary involved who oversee whatever laboratory—and it is typically a laboratory-type person.

So I share your concern. I don't have anything further to say other than that.

Mr. VISCLOSKY. Do you think we should change that policy?

Secretary BODMAN. I don't know. That is a fair comment. I don't know. I simply don't know about the nature of what is in the contracts. We have so-called M&O contracts that govern the relationship between the laboratory and the contractor that is responsible.

CONTRACT REIMBURSEMENT

Mr. VISCLOSKY. There was an interchange between myself and Mr. D'Agostino relative to a former employee, Sean Carpenter at Sandia. At about this time last year, there was a jury award for $4.6 million in Mr. Carpenter's favor. At the time, D'Agostino when I asked if that was going to be reimbursed to the contractor—$5.6 million—and accordingly whether the punitive damages, which were $4 million, are allowable will depend on whether Mr. Carpenter's termination resulted from compliance with specific terms and conditions of the contract.

We are currently analyzing this issue. Again, my concern is where you had a jury and a court impose punitive damages, not just somebody made a mistake, and that somebody in the Depart-

ment, well, we are looking to see about the specific terms and conditions of the contract with the contractor. It raises a serious question about what the hell these contracts look like as far as the allowable reimbursement.

Secretary BODMAN. I agree with the thrust of your question, your inquiry, but I simply don't know, nor do I have an update in terms of the numbers. I should have that and I will happily provide that to you.

Mr. VISCLOSKY. It is a question for the record as far as the last 24 months, and then specifically relative to Mr. Carpenter, because subsequently there has been an additional change. On September 26 on the Carpenter case, of 2007, a settlement agreement was executed by the parties. The question is, and again for the record I would appreciate it, did DOE reimburse Sandia Corporation for the amount paid to Mr. Carpenter pursuant to that settlement.

Secretary BODMAN. I don't know.

Mr. VISCLOSKY. Just so you have a sense, we have a series of three votes in a number of minutes. I would like at some point then we would recess and come back, simply because we do have some additional questions. We have about $25 billion on the table.

Secretary BODMAN. I understand that.

STOCKPILE STEWARDSHIP

Mr. VISCLOSKY. Last year in doing our work on Stockpile Stewardship, there was a proposal last year to build a replacement warhead. The Committee went to great pains to suggest that the administration, and in this case the Secretary of Energy, the Administrator of NNSA, the Secretary of Defense, Joint Chiefs of Staff and the Intelligence Community, join together to develop and submit a comprehensive Nuclear Weapons Strategy for the 21st Century.

During testimony on the issue on March 29, General Cartwright did indicate that strategy did not exist at that point in time. You did have the AAAS indicate that as far as what that strategy should look like, the panel believes that the plan for nuclear weapons enterprises must have a clear rationale on a bipartisan basis if it is to be sustained over 25 years, through a number of administrations and dozens of Congresses, recognizing that circumstances change, not, if you would, the policy of a particular administration, but of the country.

There was House report language that was referred to in the conference. I am wondering where are you and the Department, as well as defense and the intelligence community, in developing that strategy? Because obviously, we have an issue as far as the Stockpile Stewardship program and the size of the complex. My thought is, until you know where you are going——

Secretary BODMAN. No, I understand, and they are in the process of doing that—"they" meaning the NNSA working with the Defense Department, working with the State Department. There is a so-called "white paper" that is being developed.

I also think there is going to be a meeting on a number of these issues with the laboratory heads meeting with you this afternoon, as I understand it.

Mr. VISCLOSKY. Mr. Secretary, there was going to be a meeting. That is now cancelled simply because we will be done voting shortly for the week, and most members will be unable to attend, but I would want to be clear for the record that the direction is for the national government, on behalf of the country—not a particular administration—have a strategy in place, although we appreciate the fact that——

Secretary BODMAN. I understand. The idea was to do a classified briefing for you and other members of the committee. There is a white paper that is being developed that is due out I believe later on this summer, I guess.

GNEP

Mr. VISCLOSKY. On the GNEP facilities, in the 2008 appropriations conference report, there is language saying that funding under this in the amended bill provides $181 million for the Advanced Fuel Cycle Initiative. Of this amount, $151 million is for continued research and development on spent fuel recycling and advanced reactor design, and no funds are provided for facility construction—and I would emphasize those words—for technology demonstration or commercialization.

In the 2009 budget request, there are funds requested of $33.4 million for transmutation research and development which would fund site evaluation infrastructure design to support a nuclear fuel recycling center and advanced recycling reactor which, if brought to fruition, would be two construction projects.

Secretary BODMAN. That is correct, but it is only design. It is the development of, and it is not monies for construction, which I believe was the intent of Congress.

Mr. VISCLOSKY. There is no construction money.

Secretary BODMAN. That is right.

Mr. VISCLOSKY. The budget request $53 million for advanced fuels research development testing, which includes funding to continue to do all cost, scope and schedule information for transient test capability. Would that be ultimately a physical facility that would be constructed? I am not suggesting you are going to build it in 2008.

Secretary BODMAN. I don't know.

Mr. VISCLOSKY. Okay.

Secretary BODMAN. I would be happy to respond to that.

Mr. VISCLOSKY. Okay. The budget also cites the need for improvements in existing DOE laboratory facilities, and certainly for the record, I would ask which laboratories, for what purposes, and how much. By inference, at least, that would also be—and I am not saying you want to do construction in 2008—but construction.

Secretary BODMAN. This is not intended to be construction in 2008.

Mr. VISCLOSKY. I understand that.

Secretary BODMAN. It is the 2009 budget.

Mr. VISCLOSKY. Right. And you have a 2009 budget request for $10.3 million for a first-of-a-kind world-class nuclear fuel cycle research development and demonstration facility, which would be another construction project in 2009.

Secretary BODMAN. In theory, that is correct. I don't think that is counter to the intention of Congress.

Mr. VISCLOSKY. It is not counter to the intent, but there is some intent involved when we are suggesting you have monies for research and investigations, but also you are getting all set to build five facilities, and not in 2008, but setting the stage, when Congress over the last 2 years, if I am correct, has reduced the administration's request for their funding. Again, it is kind of sending a signal here, but it would appear that people are going ahead and getting ready to build four or five projects.

Secretary BODMAN. We are trying to spend the money in as intelligent a way as we can. In part, that would be designing facilities. But if you wish us not to design facilities, then we ought to know that.

Mr. VISCLOSKY. I guess I am suggesting that Congress said no construction and you are not constructing, but you are——

Secretary BODMAN. Sometimes Congress changes its mind, sir. I would observe. It doesn't happen often, but sometimes.

Mr. VISCLOSKY. Sometimes we do.

Secretary BODMAN. And therefore we want to try to be ready. That is all.

Mr. VISCLOSKY. Okay. Good answer. It is my understanding that the department's environmental impact statement for greater than class C waste includes waste volumes generated that are prone to a nuclear fuel cycle research, development and demonstration facility. Is that correct?

Secretary BODMAN. I don't know the answer to that.

Mr. VISCLOSKY. If you could answer for the record.

Secretary BODMAN. I would be happy to.

NUCLEAR FUEL CYCLE RESEARCH

As a specific action being considered in DOE's Programmatic Environmental Impact Statement (PEIS) for the Global Nuclear Energy Partnership (GNEP) program, construction and operation of the AFCF may be reasonably foreseeable. Under the National Environmental Policy Act, agencies must consider the reasonably foreseeable actions that could contribute to cumulative impacts. The waste volume estimates developed by DOE for the GNEP research facility are based on conceptual engineering design and past operating experience. We believe these estimates are reliable for the purposes of analysis in the greater-than-class C (GTCC) EIS.

Mr. VISCLOSKY. And if it is affirmative, wouldn't it seem to be optimistic, considering where you are, that you are already planning on the waste stream from these facilities?

Secretary BODMAN. This is on GNEP?

Mr. VISCLOSKY. Yes, sir.

Secretary BODMAN. GNEP is intended to reprocess spent fuel. So that is what is referred to, I believe. The idea of GNEP is two-fold. One is to do the necessary technical work that is required to clean up and to prepare the fuel for use in a fast reactor, and then to design the fast reactor, et cetera, et cetera. So that is one piece of it.

The other piece is to try to organize internationally, and we have been very successful in doing that. I think we have 21 or 22 countries signed up now. That is very encouraging.

GNEP TRAVEL

Mr. VISCLOSKY. Mr. Secretary, if we are talking about, then, the travel relative to GNEP, the department has apparently indicated that given the level of congressional funding, there may be layoffs relative to this program.

Secretary BODMAN. Relative to GNEP?

Mr. VISCLOSKY. Yes, sir.

Secretary BODMAN. I am unaware of that.

Mr. VISCLOSKY. I stand corrected.

Secretary BODMAN. No, I am not saying you are wrong. I am just saying I am unaware of that. My colleague just reported to me, sir, that if we were to cancel the research work that is ongoing related to GNEP, in order to compete it, and it was done ahead of time—along the lines that were mentioned to the congressman—that there would be some layoffs by definition. If that is the case, and if people would stop doing the work. I don't have the numbers offhand of what they would be.

Mr. VISCLOSKY. If I can get back to the travel. Last week, the committee requested a detailed listing of foreign travel conducted in relationship to GNEP.

Secretary BODMAN. Right.

Mr. VISCLOSKY. And asked if we could have it 2 days before the hearing. We got that last night. We would want to know, and would be happy to have it supplied for the record, what is the total number of foreign trips taken in which GNEP was one of the principal trip purposes?; what are the list of destinations for the GNEP-related trips? We have at least one here where someone spent a month apparently in France—must have been an extensive conference.

How many DOE federal employees and contractors engaged in such foreign travel? What were the total costs of such GNEP-related foreign travel? And how were those costs distributed among the nuclear energy, nuclear defense and nonproliferation, departmental administration, and other relevant appropriation accounts?

If you could for the record, what is your specific statutory authorization to engage with any foreign countries or enlist foreign partners for GNEP?

Secretary BODMAN. What is my——

Mr. VISCLOSKY. Your statutory authority.

Secretary BODMAN. Okay. I don't know.

Mr. VISCLOSKY. And what specific appropriations, if any, were made available for any foreign activities under advanced fuel cycle or GNEP?

Secretary BODMAN. We would be happy to provide all that for you.

Mr. VISCLOSKY. Okay.

TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | AUBERTI | GERARDO | Contractor | ANL | 200705041 | 4/21/2007 | 5/6/2007 | 2,900.00 | France | Nice | Traveler is coauthor of 2 papers to be presented at conference. With participation at conference, I will be informed of most recent progress on nuclear data measurements, evaluation and associated covariances. I will also attend meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems". In frame of AFCI program, a Work Package titled "Nuclear Data Sensitivity" that I am responsible for, in Transmutation Engineering area is devoted to uncertainty assessment of impact of nuclear data uncertainty on major neutronic parameters of reactors of interest for AFCI program and consequent definition of future needs. | AF5820100 |
| NE | AUBERTI | GERARDO | Contractor | ANL | 200705041 | 4/21/2007 | 5/6/2007 | | Italy | Roma | Personal leave and weekends | AF5620100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | 4,576.51 | Korea | Seoul | Will layover for 1 night in Seoul before traveling on to Daejeon. | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | | Korea | [Other] - Daejon | Participate in the design review of the next generation volooxidation equipment for the Korean I-NERI project. "Development of Voloxidation Process for Treatment of LWR Spent Fuel". Technical and planning meetings will be held with leaders from the INL and KAERI. | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | | Korea | Seoul | Travelers with stop over in Seoul so that they can get the early AM flight back to the US. | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | 4,273.00 | Korea | Seoul | Office Stop Over. Will travel from Seoul to Daejeon. | AF5805100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | | Korea | [Other] - Daejeon | Discuss recent results on voloxidation research and plan continued testing parameters with KAERI | AF5805100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | | Korea | Seoul | Official layover. Will travel to US from Seoul. | AF5805100 |
| NE | BENEDICT | ROBERT | Contractor | INL | 200602241 | 1/6/2006 | 1/13/2006 | 3,724.00 | Korea | Seoul | Attend the kick-off meeting for the US-KOREA I-NERI project. "Development of Head-end Pyrochemical Red | AF5805000 |
| NE | BENEDICT | ROBERT | Contractor | INL | 200602241 | 1/6/2006 | 1/13/2006 | | Korea | [Other] - Daejeon | Attend the kick-off meeting for the US-Korea I-NERI project. "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels". Technical and planning meetings will be held with leaders from the INL and KAERI. | AF5805000 |
| NE | CAHALAN | JAMES | Contractor | ANL | 200707379 | 5/9/2007 | 5/17/2007 | 2,249.00 | Japan | Fukui | At the MONJU test CRP meeting, present U.S. technical position for benefit of SFR Gen IV and GNEP program development support. At the TWG meeting, U.S. authorship of fast reactor status report to support GNEP/ABR technical project development and facilitate international cooperation on safety and licensing design features. | AF5830100 |
| NE | CAHALAN | JAMES | Contractor | ANL | 200717226 | 10/22/2007 | 10/26/2007 | 2,577.71 | France | [Other] - Marcoule | Attend IAEA consultants meeting on benchmark analysis of PHENIX End-of-Life test as U.S. representative. Present U.S. technical position for benefit of SFR Gen IV and GNEP program development support. | AF5830100 |
| NE | CARPIELLO | MICHAEL | Contractor | LANL | 200706688 | 10/24/2006 | 10/28/2006 | 3,314.96 | Russia | Moscow | US/Russia experts meeting on Civilian Nuclear Energy. Participate as subject matter expert in transmutation and fast reactor design. | AF5810100 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200604823 | 3/11/2006 | 3/18/2006 | 4,557.47 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO installations. | AF5800000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200614593 | 9/17/2006 | 9/30/2006 | 6,989.82 | Germany | [Other] - Karlsruhe | Tour of facilities and discussion of collaborations. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200614593 | 9/17/2006 | 9/30/2006 | | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA. Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU). | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200617313 | 10/13/2006 | 10/21/2006 | 5,221.67 | Japan | Tokyo | Layover in Tokyo before traveling on to Tsuruga. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200617313 | 10/13/2006 | 10/21/2006 | | Japan | [Other] - Tsuruga | Tour Nuclear Facilities in Japan at the request of JAEA. Attend GACID PMB Meeting at Tsuruga and tour facilities. Tour facilities at Oarai and Tokai/JOYO. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200703688 | 2/4/2007 | 2/9/2007 | 4,494.67 | France | [Other] - Cadarache | Attend GACID/JOYO and PMB meetings at Cadarache. Tour Nuclear Facilities at Cadarache at the request of CEA. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200708325 | 5/18/2007 | 5/27/2007 | 4,748.35 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | 4,960.78 | Japan | Tokyo | Layover in Tokyo before traveling on to Tsuruga by train. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Tsuruga | Tour Nuclear facilities in Japan at the request of JAEA. Attend GACID PMB Meeting at Tsuruga and tour facilities. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Mito | Tour Nuclear facilities in Japan at the request of JAEA. Attend JOYO installations agreement. Attend 30th Anniversary of JOYO reactor operations. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | Tokyo | Tour Nuclear facilities in Japan at the request of CRIEPI. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200717423 | 10/9/2007 | 10/15/2007 | 4,106.68 | Japan | Tokyo | To attend the GIF and Bilateral meetings between JAEA and DOE. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | 3,202.40 | Korea | Seoul | To attend Advanced Fuel PMB Meeting. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | | Japan | Tokyo | Meet with CRIEPI to discuss collaborative transuranic fuel research. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | | Japan | [Other] - Mito | To attend GACID technical specialist meeting. | AF5810000 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | 2,571.05 | France | Montpellier | Official stop over | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | | France | [Other] - Nimes | The OECD/NEA Ninth Information Exchange Meeting will cover the role of partitioning-transmutation in advanced nuclear fuel cycles and performance of advanced reactors. The DOE/CEA meeting will discuss progress in actinide partitioning. | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | | France | Montpellier | Official stop over | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200705960 | 3/18/2007 | 3/22/2007 | 2,861.11 | France | Paris | Participate in Forth OECD/NEA Working Party Expert Group Meeting on Chemical Partitioning Flowsheets and Separation Criteria. Keep U.S. Advanced Fuel Cycle R&D Program abreast of international Developments in Spent Fuel Partitioning Flowsheet and Separation Criteria Development. | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/22/2007 | 7/28/2007 | 5,800.36 | Japan | [Other] - Mito | Traveler will participate in the 2nd meeting of U.S. - Japan Fuel Cycle Technology Working Group and tour Tokai Plant. | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/22/2007 | 7/28/2007 | | Japan | [Other] - Mizawa | Traveler will participate in tour of the Rokkasho Reprocessing Plant, in Misawa, Japan. | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/22/2007 | 7/28/2007 | | Japan | Tokyo | 7/27: Overnight in Tokyo for travel back to US July 28, 2007. | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | 2,846.76 | France | Montpellier | Official Stop Over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | | France | [Other] - Nimes | The OECD/NEA Ninth Information Exchange Meeting will cover the role of partitioning-transmutation in advanced nuclear fuel cycles and performance of advanced reactors. The DOE/CEA meeting will discuss progress in actinide partitioning. | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | | France | Montpellier | Official stop over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703500 | 2/3/2007 | 2/10/2007 | 3,167.43 | Korea | Seoul | 2/4: Official Stop Over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703500 | 2/3/2007 | 2/10/2007 | | Korea | [Other] - Daejeon | Participate in discussions relating to the international collaboration to treat commercial nuclear spent fuel, specifically, research & development of advanced dry head-end processes (e.g., voloxidation). Participate in the 5th I-NERI Program Review Meeting. Participate in technical meetings regarding special projects. | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703500 | 2/3/2007 | 2/10/2007 | | Korea | Seoul | 2/9: Official Stop | AF5805100 |
| NE | DIXON | BRENT | Contractor | INL | 200716215 | 10/1/2007 | 10/5/2007 | 4,221.91 | Austria | Vienna | INPRO collaborative project, GAINS, a Global Architecture of INL Based on Thermal and Fast Reactors with the inclusion of a Closed Nuclear Fuel Cycle. Participate in discussion of scenarios for transition to new thermal reactors. Include discussion of systems analysis to facilite transition. | AF5800000 |

"OFFICIAL USE ONLY"

TRAVEL BY NA, NE, NA, AND SY 01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | EHRESMAN | TERI | Contractor | INL | 200715470 | 9/12/2007 | 9/19/2007 | 4,429.65 | Austria | Vienna | Part of advanced team for IAEA Ministerial and booth support for DOE/GNEP exhibit at IAEA meeting. | 181205200 |
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | 4,732.93 | France | Nice | Act as Technical Program Chair for International Conference on Nuclear Data for Science and Technology | AF5800000 |
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | | France | Aix-en-Provence | US/France GNEP Discussions and US/France I-NERI Reviews | AF5800000 |
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | | Germany | (Other) - Karlsruhe | AFCF discussions. | AF5800000 |
| NE | FINCK | PHILLIP | Contractor | INL | 200804776 | 2/6/2008 | 2/13/2008 | 1,970.00 | France | Aix-en-Provence | Strategic Direction of Research in the US, GNEP R&D, and Reactor Physics. | AF5850000 |
| NE | FITZGERALD | CHERYL | Contractor | INL | 200716264 | 9/14/2007 | 9/20/2007 | 5,316.00 | Austria | Vienna | As a member of the GNEP Ministerial team, I am responsible for the Secretary of Energy Briefing Book preparations. There are many last minute changes that must be accomplished. I am responsible for writing policy papers and other documents in support of the Ministerial. As a member of the GNEP International Office, I will be staffing the GNEP display and will talk to people from other countries about the GNEP initiative who come to the display to learn about GNEP. | AF5850000 |
| NE | FITZGERALD | CHERYL | Contractor | INL | 200802496 | 12/8/2007 | 12/16/2007 | 4,204.78 | Austria | Vienna | The Global Nuclear Energy Partnership (GNEP) Steering Group Meeting is the first meeting of this committee since its establishment in September, 2007, by the GNEP Executive Committee. This Group will hear baseline briefing by the IAEA on policy issues that will impact the efforts of the Partnership, agree on an Action Plan for its future strategy, establish two working groups on Reliable Fuel Services and Infrastructure Development, and consider countries for potential membership. In light of the fact that the Partnership consists of 17 members and has 21 countries as observers, the use of teleconferencing/ electronic media not feasible. | AF5850000 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200607863 | 5/13/2006 | 5/19/2006 | 2,609.75 | China | Beijing | Traveler will participate in the IAEA Technical Working Group on Fast Reactor Status of U.S. research on various fast reactor technologies and will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200701590 | 12/2/2006 | 12/9/2006 | 3,726.00 | Austria | Vienna | Attend 2 technical meetings, 1) Technical meeting on review of status of accelerator driven systems R&D and technology, and 2) Technical meeting on review of status of fast reactor R&D and technology. Objectives are to prepare inputs needed to update respective status reports. Participants are requested to provide corresponding national contributions, discuss overall structure of status reports and contribute towards drafting first draft of status reports. U.S. will benefit from meetings by gaining knowledge of status of fast reactor R&D and technology of IAEA member states. U.S. needs to participate due to partnership aspects of GNEP. | AF5810100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200707739 | 5/12/2007 | 5/19/2007 | 3,704.00 | Japan | (Other) - Tsuruga | The traveler will participate in the IAEA Technical Working Group on Fast Reactors. Status of U.S. research on various fast reactor technologies will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200707739 | 5/12/2007 | 5/19/2007 | | Japan | Kyoto | The traveler will participate in the IAEA Technical Working Group on Fast Reactor. Status of U.S. research on various fast reactor technologies will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200801545 | 12/3/2007 | 12/9/2007 | 0.00 | Austria | Vienna | Attend two technical meetings. Objectives of two back-to-back Technical Meetings (1) "Technical Meeting on the review of status of accelerator driven system R&D and technology" and (2) "Technical Meeting on the review of status of fast reactor R&D and technology" are to prepare inputs needed to update respective status reports. The participants are requested to provide corresponding national contributions, to discuss overall structure of status reports and contribute towards drafting first draft of status reports. U.S. benefits from meeting by gaining knowledge of status of fast reactor R&D and technology of IAEA member states. | AF5810100 |
| NE | GOMBERT | DIRK | Contractor | INL | 200703887 | 3/25/2007 | 3/31/2007 | 4,198.40 | Italy | (Other) - Barga | INL is the lead laboratory for the Global Nuclear Energy Partnership Program, and is publishing the Integrated Waste Management Strategy in 2007. Dirk Gombert will present a summary of this strategy and the need for waste form data to the international audience at the Barga conference, March 25-29, 2007. | DH3000000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200703887 | 3/25/2007 | 3/31/2007 | | Italy | Pisa | Traveler will layover for a day in Pisa before traveling on to the U.S. | DH3000000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/2/2007 | 12/14/2007 | 2,874.00 | Japan | Tokyo | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group. | AF5830000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/2/2007 | 12/14/2007 | | Japan | (Other) - Mito-City, Ibaraki | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group. | AF5830000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/2/2007 | 12/14/2007 | | Japan | Nagoya | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group | AF5830000 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | 4,625.08 | Japan | Tokyo | Dr. Halsey will be participating in the 3rd Meeting of the GNEP Waste Management Group. participants will be from DOE, ANL, SRNL, LLNL, PNNL, INL and the JAEA. The working group is tasked with cooperation on mutually beneficial joint R&D for waste management under advanced fuel cycles. The traveler is a technical member of this working group. The meetings in Japan are for further definition of a joint R&D plan, and to establish writing assignments and content summaries for the initial Phase 1 report. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | (Other) - Mito | Dr. halsey will be participating in a Site tour with the GNEP Waste Management Group. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | (Other) - Nagoy | Dr. Halsey will be part of the GNEP Waste Management Site tour. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | Tokyo | Dr. Halsey will be participating in the 3rd Meeting of the GNEP Waste Management Group. participants will be from DOE, ANL, SRNL, LLNL, PNNL, INL and the JAEA. The working group is tasked with cooperation on mutually beneficial joint R&D for waste management under advanced fuel cycles. The traveler is a technical member of this working group. The meetings in Japan are for further definition of a joint R&D plan, and to establish writing assignments and content summaries for the initial Phase 1 report. | AF5830100 |
| NE | HAYES | STEVEN | Contractor | INL | 200515107 | 9/23/2006 | 9/29/2006 | 3,840.87 | France | (Other) - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA. Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at ICMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU). | AF5810000 |
| NE | HAYES | STEVEN | Contractor | INL | 200706354 | 4/17/2007 | 4/29/2007 | 3,995.77 | France | (Other) - Saclay and Cadarach | Saclay meeting with french legal representatives on JOYO Trilateral arrangements. Attend Phenix steering committee, US DOE/CEA Bilateral, and US DOE/CEA INERI meetings. | AF5810000 |
| NE | HAYES | STEVEN | Contractor | INL | 200713373 | 7/21/2007 | 7/26/2007 | 3,758.67 | Japan | (Other) - Ibaraki | Attend US-Japan Fuel Cycle Technology Working Group (Japan Atomic Energy Agency). This meeting is arranged under a bilateral agreement between US-DOE and corresponding Japanese ministries. Discuss collaborative research opportunities in metallic fuel development for actinide transmutation under GNEP. | AF5810100 |
| NE | HERBST | RONALD | Contractor | INL | 200614842 | 10/13/2006 | 10/24/2006 | 3,216.30 | Australia | Sydney | Present paper as the author and support presentation of other papers that I am a co-author of. Obtain information on latest research performed in the area of the nuclear fuel cycle. To discuss immobilization technologies for waste and product streams from spent fuel treatment as part of the GNEP/AFCI program. Discuss results of testing performed by AMSTO on waste/product simulants to support the AFCI program and discuss future collaboration opportunities. | 39AF00000 |
| NE | HERRMANN | STEVEN | Contractor | INL | 200607262 | 1/8/2006 | 1/13/2006 | 3,604.32 | Korea | Seoul | Attend the kick-off meeting for the US-KOREA I-NERI project, "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels." Technical and planning meetings will be held with leaders from the INL and KAERI. Official Layover in Seoul before traveling on to Daejeon. | AF5805000 |

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01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | HERRMANN | STEVEN | Contractor | INL | 200602262 | 1/6/2006 | 1/13/2006 | | Korea | [Other] - Daejeon | Attend the kick-off meeting for the US-Korea I-NERI project, "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels." Technical and planning meetings will be held with leaders from the INL and KAERI. | AF5805000 |
| NE | HILL | TONY | Contractor | LANL | 200614782 | 9/19/2006 | 9/30/2006 | 5,010.00 | France | [Other] - NIMES/GOV | Attend the Actinide and Fission Product Partitioning and Transmutation 6th Information. Exchange Meeting | AF5820100 |
| NE | HILL | ROBERT | Contractor | ANL | 200704724 | 3/11/2007 | 3/16/2007 | 3,732.00 | Russia | [Other] - Obninsk | Traveler will attend the first workshop for the US-Russia Civil Nuclear Energy Working Group in Moscow. Traveler will lead the Reactors Subgroup that will be tasked to identify and process specific bilateral collaborations. This work will be consistent with fast reactor activities in the DOE GNEP Program. | AF5855000 |
| NE | HILL | ROBERT | Contractor | ANL | 200704724 | 3/11/2007 | 3/16/2007 | | Russia | Moscow | Traveler will meet with team to prepare summary reports. | AF5855000 |
| NE | HILL | ROBERT | Contractor | ANL | 200707840 | 4/22/2007 | 4/26/2007 | 3,000.00 | France | [Other] - Cadarache | Traveler will participate in DOE/CEA Collaboration Meeting on GNEP Technology. Traveler will lead discussions on reactor technology proposals. | AF5800000 |
| NE | HILL | ROBERT | Contractor | ANL | 200712249 | 6/25/2007 | 6/29/2007 | 4,000.00 | Austria | Vienna | Traveler will attend the second workshop for the U.S.-Russia Civil Nuclear Energy Working Group in Vienna. Traveler will lead the Reactors Subgroup that will be tasked to identify and propose specific bilateral collaborations. This work will be consistent with fast reactor activities in the DOE GNEP program. | AF5800000 |
| NE | HILTON | BRUCE | Contractor | INL | 200607363 | 4/23/2006 | 4/27/2006 | 3,211.10 | Austria | Vienna | Technical Meeting on Status and Trends in Water Reactor Fuel Performance and Technology. | AF5810100 |
| NE | HILTON | BRUCE | Contractor | INL | 200615088 | 9/17/2006 | 9/30/2006 | | Germany | [Other] - Karlsruhe | Tour of facilities and discussion of collaborations. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200615088 | 9/17/2006 | 9/30/2006 | 6,303.88 | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA. Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at TEMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU). | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200703721 | 2/4/2007 | 2/9/2007 | 3,822.16 | France | [Other] - Cadarache | Attend GACID/JOYO and PMB meetings at Cadarache. Tour Nuclear Facilities at Cadarache at the request of CEA. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | Tokyo | Layover in Tokyo before traveling on to Tsuruga by train. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | 4,721.70 | Japan | [Other] - Tsuruga | Tour Nuclear facilities in Japan at the request of JAEA. Attend GACID PMB Meeting at Tsuruga and tour facilities. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Mito | Tour Nuclear facilities in Japan at the request of JAEA. Attend JOYO installations agreement. Attend 30th Anniversary of JOYO reactor operations. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | Tokyo | Tour Nuclear facilities in Japan at the request of CRIEPI. | AF5810000 |
| NE | HOFMAN | GERARD | Contractor | ANL | 200706313 | 3/18/2007 | 3/22/2007 | 2,900.00 | France | [Other] - Cadarache | Participate in the US-RF Workshop on Collaboration in Fuel Testing and Transmutation associated with the Global Nuclear Energy Partnership (GNEP). | AF5810100 |
| NE | IMEL | GEORGE | Contractor | ANL | 200512318 | 9/16/2005 | 9/15/2006 | 31,668.00 | France | [Other] - Cadarache | Continue DOE/CEA collaboration by actively participating in experimental programs in Europe. DOE gains immediate access to experimental data obtained in reactor physics programs in France; for relatively small amount of funding through this assignment, U.S. has gained great deal of leverage; in FY06, traveler will conclude experimental interpretation of MUSE program and complete Phase 1B activities in TRADE program in Italy; analysis techniques developed in these programs will be transferable to RACE program in U.S.; anticipated that traveler will lead experimental teams from CEA and ENEA to assist in RACE Texas experiments in future. | AF5820100 |
| NE | IMEL | GEORGE | Contractor | ANL | 200613660 | 9/21/2006 | 9/15/2007 | 85,000.00 | France | Aix-en-Provence | This travel continues the on-site collaboration between DOE and CEA at Cadarache. The collaboration in this fiscal year will involve active participation in the French GenIV program, specifically in design of reactor called for by Chirac (to be operational before 2018). Through this on-site collaboration, U.S. DOE will have access to French scenario and design studies, as well as experimental data from fast reactor experiments (e.g., ENIGMA) at relatively low cost. | AF5820100 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200617057 | 10/14/2006 | 10/21/2006 | 2,747.76 | Austria | Vienna | Technology issues and options for global deployment of small & medium sized reactors. Topics on economics, safety, emergency planning, and reactor technologies for SMRs is relevant to IRIS project (ORNL is participant) and GNEP (ORNL is expected to be participant). | AF3610100 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200618390 | 11/5/2006 | 11/10/2006 | 2,426.91 | Spain | Santander | Traveler will participate in semi-annual meeting of IRIS (International Reactor Innovative & Secure) Consortium. ORNL has 2 I-NERI projects related to IRIS and results from these projects will be discussed. Also, IRIS is of interest to DOE as part of GNEP. Technal progress and design status of IRIS will be presented and plans for FY07 work scope will be discussed. | AF3630010 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200704599 | 3/11/2007 | 3/16/2007 | 3,031.17 | Russia | [Other] - Obninsk | US & Russian experts meeting on civilian nuclear energy. Participate as a subject matter expert in nuclear reactor design. | DH3000000 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200704599 | 3/11/2007 | 3/16/2007 | | Russia | Moscow | US & Russian experts meeting on civilian nuclear energy. Participate as a subject matter expert in nuclear reactor design. | DH3000000 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200801399 | 11/24/2007 | 12/1/2007 | 3,430.04 | Austria | Vienna | Attended INPRO Common user Criteria (CUC) consultancy meeting. Traveler is Director of GNEP Grid Appropriate Reactors Campaign, which is highly related to CUC activity. | AF5855000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | 9,969.42 | Russia | Saint Petersburg | Meet 10/1/07 with KRI and VNIPIET Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for ANL. The feasibility will assess using KRI facilities to perform coupled end-to-end tests of advanced separations flowsheets, including waste form development, under contract. 192-7107. Rosatom conference, The 10th International Conference, Safety of Nuclear Technologies: Radioactive Waste and Spent Nuclear Fuel Management and participate in panel session on International Cooperation in radioactive waste and spent nuclear fuel management. | AF5800000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | | Russia | Moscow | Meet with VNIINM, Rosatom and Atomniform, Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for Argonne National Laboratory 192-8107. The feasibility study will assess using KRI facilities to perform coupled end-to-end tests of advanced separations flowsheets, including waste form development, under contract. VNIINM and Atomiform have expertise in waste forms are to be sufficiently robust to meet U.S. Repository requirements. | AF5800000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | | Russia | Saint Petersburg | Meet 10/11-12/07 with KRI and VNIPIET Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for ANL 10/1/07. The feasibility study will assess using KRI facilities to perform coupled end-to-end tests of advanced separations flowsheets, including waste form development, under contract. The flowsheets to be investigated will not separate pure plutonium and will provide fuel materials capable of fast burner reactor use. The waste forms are to be sufficiently robust to meet U.S. repository requirements. | AF5800000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200604824 | 3/11/2006 | 3/18/2006 | 4,416.87 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO Installations. | AF5800000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200609038 | 5/27/2006 | 6/4/2006 | 4,871.84 | France | Nice | The traveler will chair the European Materials Research Society EMRS Symposium N session on nuclear fuels. The traveler will present a lecture titled "Fuel Cladding Chemical Interaction Differences in Actinide Transmutation Metallic Fuels." Discussions on current and future collaborations with international partners will take place during the meeting. Concurrent to the latter part of the EMRS meeting, the traveler will attend the Materials Modeling and Simulation of Nuclear Fuels workshop. | AF5810100 |

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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | KENNEDY | JOHN | Contractor | INL | 200615313 | 9/23/2006 | 10/8/2006 | 5,136.98 | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA.<br>Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU). | AF5810000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200615313 | 9/23/2006 | 10/8/2006 | | Germany | [Other] - Karlsruhe | Tour facilities and discuss fuel properties measurements at Cadarache Sept 21-22, participate in the FUTURIX-FTA experiment and Phénix Irradiations Steering Committee meeting on Sept 25 at the Marcoule/Phenix reactor in his capacity as the lead for the transmutation fuel fabrication. Participate and present a paper at the 9th OECD NEA in Nimes from Sept 26-29, meet with his counterpart(s) to update the US-EURATOM Advanced Nuclear Fuel Properties, Measurements, and Modeling I-NERI as project lead in Nimes during the IEMPT meeting and/or at the Institute for Transuranium Elements (ITU) in Karlsruhe, Germany. | AF5810000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200706355 | 4/17/2007 | 4/29/2007 | 5,800.52 | France | [Other] - Saclay and Cadarach | Saclay meeting with french legal representatives on JOYO Trilateral arrangements. Attend Phenix steering committee, US DOE/CEA Bilateral, and US DOE/CEA INERI meetings. | AF5810000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | 10,727.53 | France | [Other] - Dijon | Will chair a session and present an oral contribution titled "Production of Oxide and Nitride Powders Employing Auto-Ignition Combustion Synthesis." | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Germany | [Other] - Karlsruhe | Meet with counterpart to review results and discuss progress on his function as US lead for the DOE-EURATOM I-NERI on Advanced Nuclear Fuels Properties, Characterization Measurements, and Modeling required as part of the collaboration. | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Germany | Aachen | Present an invited lecture at the University of Aachen, discuss areas of potential collaboration, and interview a potential post-doctoral candidate. | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Belgium | Brussels | Travel to Brussels to catch flight back to US. | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200717804 | 12/2/2007 | 12/8/2007 | 4,618.94 | Japan | [Other] - Mito | Attend GACID/JOYO Technical Specialist meeting on fuel sample fabrication and characterization for GACID/JOYO irradiation testing agreement and tour facilities. | AF5810100 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200604131 | 2/7/2006 | 2/11/2006 | 2,735.77 | France | Paris | Technical discussions on GNEP Initiative with Commissariat a l Energie Atomique (CEA) and DOE | AF5700000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200605612 | 2/24/2006 | 3/1/2006 | 2,801.93 | Japan | Tokyo | Technical Discussions on GNEP with DOE and Japan. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200605624 | 3/14/2006 | 3/18/2006 | 2,998.50 | France | Paris | Discussions of trilateral collaboration with CEA (France) and JAEA (Japan) on partitioning of spent nuclear fuel. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200606589 | 3/25/2006 | 3/29/2006 | 5,493.50 | Russia | Moscow | Technical discussions on GNEP Initiative with Russian Officials. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200608022 | 5/19/2006 | 5/27/2006 | 4,474.50 | China | Beijing | Technical discussions on GNEP Initiative with Chinese officials. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200608022 | 5/19/2006 | 5/27/2006 | | Japan | Tokyo | Technical discussions on GNEP Initiatives with Japanese officials. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200610954 | 5/30/2006 | 6/2/2006 | 1,621.00 | Canada | [Other] - Chalk River | Technical discussions on GNEP Initiative with DOE and Canadian officials. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200610954 | 5/30/2006 | 6/2/2006 | | Canada | Toronto | Tour Darlington Reactor Site. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200702594 | 10/24/2006 | 10/28/2006 | 3,500.00 | Russia | Moscow | Develop basis for formulation of a broad program of collaboration with Russian laboratories. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200707612 | 4/22/2007 | 4/26/2007 | 2,287.00 | France | Aix-en-Provence | Dr. Laidler is the U.S. lead for Work Package 7 of the DOE-CEA collaboration on advanced partitioning and transmutation technology development. This meeting is intended to foster cooperation in advanced nuclear fuel cycle technologies between France and the U.S. It is part of a continuing and highly successful collaborative exchange. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200711438 | 6/25/2007 | 6/29/2007 | 3,062.00 | Austria | Vienna | Discussion on contracts for future participation of Russian institutions in the GNEP program under the scope of the U.S.-Russia agreement for collaboration on civil nuclear energy. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200712485 | 7/20/2007 | 7/26/2007 | 3,543.00 | Japan | [Other] - Mito | James Laidler is the co-chair of the U.S. - Japan Fuel Cycle Technology Working Group, which will be meeting on July 23-25, 2007 at the Tokai Works of JAEA.<br>Traveler departs U.S. on Jul20/2007, arrives Jul21/2007 (Saturday); Jul22/2007 is a Sunday; departs Japan for U.S. on Jul26/2007. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200714833 | 9/23/2007 | 9/28/2007 | 4,500.00 | Russia | [Other] - Nizhny Novgorod | James Laidler will attend the Advanced Nuclear Fuel Cycle for the 21st Century seminar, organized under the aegis of the ISTC Scientific Advisory Committee. Laidler will is an invited speaker and will give presentations on the U.S. views and strategy for spent nuclear fuel partitioning and transmutation. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200713666 | 10/9/2007 | 10/13/2007 | 3,328.00 | Russia | Moscow | Discussion will center on the potential for U.S. participation in the design of a modern pilot-scale reprocessing plant to be built at Krasnoyarsk-26, Russian Federation. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200713666 | 10/9/2007 | 10/13/2007 | | Russia | Saint Petersburg | Discussion will center on the draft contract with Argonne National Laboratory for performance of separations processing testing at Khlopin Radium Institute. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200801116 | 12/2/2007 | 12/6/2007 | 1,443.00 | Russia | Moscow | Attend the Rosatom Conference, AtomEco 2007. Presentation invited by Rosatom. | AF5805000 |
| NE | LAW | JACK | Contractor | INL | 200613980 | 9/22/2006 | 9/30/2006 | 5,030.20 | France | [Other] - Nimes | Present paper titled "Flowsheet testing of the Fission Product Extraction Process for the Separation of Cesium and Strontium from Spent Nuclear Fuel." Also, a trip has been arranged to Visit a CEA facility with gamma irradiation equipment installed to obtain information to aid in operation and testing of gamma irradiation equipment installed at the INL which will be used to support the AFCI program. | AF5805100 |
| NE | LAW | JACK | Contractor | INL | 200614441 | 10/12/2006 | 10/24/2006 | 5,708.21 | Australia | Sydney | Present two papers as the author and support presentation of three other papers that I am a co-author of. Obtain information on latest research performed in the area of the nuclear fuel cycle. To discuss immobilization technologies for waste and product streams from spent fuel treatment as part of the GNEP/AFCI program. Discuss results of testing performed by ANSTO on waste/product simulants to support the AFCI program and discuss future collaboration opportunities. | AF5805100 |
| NE | LAW | JACK | Contractor | INL | 200707122 | 4/28/2007 | 5/5/2007 | 5,540.99 | United Kingdom | Manchester - Sellafield | Presentation on INL and INL Separations and Radiochemistry activities will be made to Nexia Solutions. Topics of Advanced Fuel Cycle and Process Simulation will be discussed. Plant tours of Sellafield and Thorp will be taken. Goals: Establish technical topic areas for consideration of potential collaboration with INL. | AF5805100 |
| NE | LAW | JACK | Contractor | INL | 200713288 | 8/29/2007 | 9/9/2007 | 6,558.19 | Belgium | Brugge | Present a paper describing recent research in spent fuel treatment. Obtain information on latest research performed in the area of the nuclear fuel cycle and waste treatment technologies. | AF5805100 |
| NE | MACLEAN | HEATHER | Contractor | INL | 200715647 | 10/7/2007 | 10/14/2007 | 5,203.55 | Russia | [Other] - Obninsk | October 9th, 12 & 13th Personal Leave<br>Attend Fast Reactors & Liquid Metals in Power Industry of the 21st Century as a representative of the GNEP Fuels team and give a presentation on fast reactor fuel development in the U.S. | AF5810100 |
| NE | MACLEAN | HEATHER | Contractor | INL | 200718467 | 12/7/2007 | 12/20/2007 | 6,589.19 | Austria | Vienna | Traveler will be attending both meetings as a representative of the GNEP Transmutation Fuels team. Transmutation fuels are an important part of both of these meetings and it is important for a member of the GNEP Fuels Team to attend to learn about the current status of other national programs and to share the goals and status of the US fuels program. First meeting is "Development Needs for Deployment of Advanced Fuel Cycles," December 10-12. Second meeting is, "Fast Reactor Fuel Consultancy," December 17-19. Staying in Vienna between meetings is more cost effective than coming back to the US between them. | AF5810000 |
| NE | MALOY | STUART | Contractor | LANL | 200606341 | 4/17/2006 | 4/22/2006 | 3,540.33 | Switzerland | [Other] - Villigen | As the DOE representative for the Megapie_PIE steerign committee, the traveler will attend the meeting on post-irradiation examinatics (Megapie PIE) meeting at the Paul Scherrer Institute, during the meeting they will plan the post-irradiation examination of the Megapie target and assure that important data is obtained from this unique target. | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200700978 | 11/25/2006 | 12/2/2006 | | France | Aix-en-Provence | Traveler will present on "Materials Issues for Innovative Nuclear Applications" | AF5820100 |

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01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | MALOY | STUART | Contractor | LANL | 200706979 | 11/25/2006 | 12/2/2006 | 2,314.00 | France | Aix-en-Provence | Traveller will present on "Materials Issues for Innovative Nuclear Applications" | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200706979 | 11/25/2006 | 12/2/2006 | | France | [Other] - Cadarache | Collaboration meeting re: WP3 (CEA-AFCI) | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | 3,373.00 | Germany | [Other] - Karlsruhe | Traveler is on organizing committee of Workshop on Structural Materials for Innovative Nuclear Systems (SMINS) and presenting on "Fast Reactor Materials Development and Testing for the GNEP Program" | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | | Belgium | [Other] - Mol | Will travel by train | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | | Belgium | [Other] - Mol | Update collaborations with Abdou Abderrahim in modeling and corrosion of materials in lead-bismuth. Meet researchers interested in potential postdoctoral appointments at LANL. Visit facilities at SCK CEN for future collaborations. | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200801792 | 12/1/2007 | 12/8/2007 | 2,673.00 | Austria | Vienna | Attend evaluation of the IAEA (International Atomic Energy Agency) sub-programme B.2 "Nuclear Power Reactor Fuel Engineering and Consultancy meeting. | AF5810100 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200617443 | 9/16/2006 | 9/21/2006 | 4,271.01 | Austria | Vienna | Interact with IAEA meeting attendees on Global Nuclear Energy Partnership Program plan. Represent GNEP at poster presentation | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200700429 | 1/27/2007 | 2/1/2007 | 3,476.86 | France | Paris | Work on WPFC Subgroup on Chemical Partitioning, Working Group on Separations Criteria. Working Group on Flowsheet Studies, Working Group of Fuel Cycle Transition Scenarios Studies. | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200704129 | 4/2/2007 | 4/7/2007 | 4,450.34 | France | Paris | Attend and participate in International Working group on Scientific Issues of the Fuel Cycle. | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | 4,003.49 | France | Aix-en-Provence | AFCI Bilateral agreement and I-Neri review meetings. | AF5800000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | | France | Paris | Working party fuel cycle, continue working discussions. | AF5800000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | | Germany | [Other] - Karlsruhe | Meetings at FZK, meet with Concetta Fazio on NEA WPFC work. Also meet with Massimo Salvatores and team on Systems analysis. Tour facilities | AF5800000 |
| NE | MEYER | MITCHELL | Contractor | INL | 200708430 | 5/18/2007 | 5/27/2007 | 5,387.53 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts. | AF5810000 |
| NE | MILLER | MICHAEL | Contractor | LANL | 200800156 | 11/11/2007 | 11/16/2007 | 3,109.00 | Japan | [Other] - Tokai Mura | Represent GNEP program in the safeguards area, present invited talk "Safeguards Research and Technology Development for the Global Nuclear Energy Partnership", discuss advanced safeguards R&D with international safeguards community. | AF5805100 |
| NE | MINCHER | BRUCE | Contractor | INL | 200614439 | 9/22/2006 | 9/30/2006 | 4,507.79 | France | [Other] - Nimes | Present paper titled "Radiolytic Decomposition of the PREX Process Solvent." Visit CEA facility with gamma irradiation equipment installed to obtain information to aid in operation and testing of gamma irradiation equipment installed at the INL which will be used to support the AFCI program. | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | 0.00 | Korea | Seoul | Official Stop Over. Will travel to Daejeon from Seoul. | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | | Korea | [Other] - Daejeon | Discuss recent results on volaxidation research and plan continued testing parameters with KAERI. | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | | Korea | Seoul | Official stop over. Will travel from Seoul to the US. | AF5805100 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | 4,374.70 | United Kingdom | London | Technical discussions on GNEP Initiative with United Kingdom Officials. | KJ0100000 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | | France | Paris | Traveler will return home prior to departing for Russia on 3/26. | KJ0100000 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | | Russia | Moscow | Technical discussions on GNEP Initiative with Russian Officials. | KJ0100000 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200607413 | 5/1/2006 | 5/6/2006 | 3,318.00 | France | Paris | Participate in meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems" in frame of AFCI program. a Work Package traveler is responsible for, in Transmutation engineering area is devoted to uncertainty assessment of impact of nuclear data uncertainty on major neutronic parameters of reactors of interest for AFCI program & consequent definition of future needs in improvement of nuclear data; meeting focused on assessment of status & needed improvement of advanced nuclear systems, including AFCI & GEN IV programs. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200617253 | 10/21/2006 | 10/26/2006 | 2,063.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program ENIGMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code previously proposed by Argonne will be discussed. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200705040 | 4/21/2007 | 4/27/2007 | 3,663.00 | France | Nice | Traveler is coauthor of 2 presented papers at conference. Traveler will also attend a meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems". Meeting is focused on assessment of status and needed improvement of advanced nuclear systems including those of AFCI and Gen IV programs. Discussions and results exchange among participants to WPEC subgroup 26 will help better define directions for future measurements and evaluation for cross sections playing significant role in design of advanced reactors. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | INL | 200716083 | 10/14/2007 | 10/20/2007 | 3,693.29 | Czech Republic | Prague | Attend 4th Workshop on Neutron Measurements, Evaluations and Applications - Nuclear data needs for Generation IV and accelerator driven systems. Attend meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems." Present paper and give presentation at WPEC subgroup 26. A Work Package titled Nuclear Data Sensitivity, traveler is responsible for, in the Reactor campaign area is devoted to the uncertainty assessment of the impact of nuclear data uncertainty on major neutronic parameters of the reactors of interest for the AFCI program and consequent definition of future needs in improvement of nuclear data. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200604090 | 3/11/2006 | 3/18/2006 | 4,748.59 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO irradiations. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200608783 | 5/27/2006 | 6/3/2006 | 3,253.00 | Switzerland | Zurich | 7th MEGAPIE TECHNICAL REVIEW MEETING Readiness for Irradiation | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200706212 | 4/2/2007 | 4/7/2007 | 4,531.39 | France | Paris | Attend and participate in International Working group on Scientific Issues of the Fuel Cycle. | 39AF00000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | 5,548.91 | France | Aix-en-Provence | AFCI Bilateral agreement and I-Neri review meetings. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | | France | Paris | Working party fuel cycle, continue working discussions. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | | Germany | [Other] - Karlsruhe | Meetings at FZK, meet with Concetta Fazio on NEA WPFC work. Also meet with Massimo Salvatores and team on Systems analysis. Tour facilities. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200804244 | 1/15/2008 | 1/21/2008 | 6,817.28 | Turkey | Ankara - Istanbul | Attend meetings with the President of TAEK regarding Global Nuclear Energy Partnership. This trip has already been approved by HQ and a country cable has already been issued. | AF5810000 |
| NE | PETERS | MARK | Contractor | ANL | 200707620 | 4/22/2007 | 4/26/2007 | 2,627.00 | France | Aix-en-Provence | Dr. Peters is the Head of DOE GNEP Waste Form Campaign and will be discussing potential collaborations with the French in this technical area. This meeting is intended to foster cooperation in advanced nuclear fuel cycle technologies between France and the U.S. It is part of a continuing and highly successful collaborative exchange. | AF5800000 |
| NE | PITCHER | ERIC | Contractor | LANL | 200801227 | 11/24/2007 | 11/29/2007 | 1,196.00 | Austria | Vienna | Preparation for the ArcAge 09 meeting: chair selections, arrangement of sessions, proceedings publication | AF5820100 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200713406 | 7/20/2007 | 7/28/2007 | 48,184.00 | Japan | [Other] - Mito | Monica Regalbuto will be attending a meeting as a U.S. expert in separations technology. | AF5800000 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200713406 | 7/20/2007 | 7/28/2007 | | Japan | [Other] - Misawa | Tour the RokkaSho Reprocessing Plant. | AF5800000 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200801818 | 12/7/2007 | 12/13/2007 | | Austria | Vienna | Pre-meetings with B.P. Singh, Nuclear Engineering Lead, to coordinate presentations and incorporate latest GNEP guidance from DOE/NE. | AF5800000 |

TRAVEL BY NA, NE, NA, AND SY (01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | REGALBUTO | MONICA | Contractor | ANL | 200801818 | 12/7/2007 | 12/13/2007 | 453.00 | Austria | Vienna | Attend IAEA Technical Meeting on "Development Needs for Deployment of Advanced Fuel Cycles" and present invited presentation titled "An Overview of the UREX+ Processes". This paper will (1) provide an overview of the UREX+ family of processes, (2) summarize all of the experimental test runs done, and (3) describe the tools used to design these processes. | AF5800000 |
| NE | RODGERS | ARTHUR | Contractor | LLNL | 200716608 | 9/16/2007 | 9/21/2007 | 3,419.04 | Japan | Tokyo | The US-Japan Joint Nuclear Energy Action Plan (JNEAP) was signed by the US and Japan in April 2007. This civil nuclear energy action plan builds upon the cooperative research and development discussions that have taken place between the US and Japan. This includes collaboration on policies and programs that support the construction and regulation of new nuclear power plants and strengthen the nonproliferation regime. The R&D activities of the Action Plan are designated through 6 GNEP R&D Working Groups which are co-chaired by a designated expert from the US and Japan respectively. | AF5850000 |
| NE | SCOTT | SARA | Contractor | LANL | 200706741 | 10/24/2006 | 10/28/2006 | 3,374.06 | Russia | Moscow | US/Russia experts meeting on Civilian Nuclear Energy. Participate as subject matter expert in transmutation and fast reactor design. | AF5810100 |
| NE | SCOTT | SARA | Contractor | LANL | 200711252 | 6/25/2007 | 6/28/2007 | 3,651.03 | Austria | Vienna | As a SME in transmutation technologies, topics covered will include: International fuel services, monitoring, accounting, and control technologies; common vision; Advanced spent fuel processing and waste management; and fast reactors. | AF5850000 |
| NE | SCOTT | SARA | Contractor | LANL | 200801081 | 11/3/2007 | 11/10/2007 | 5,819.00 | Austria | Vienna | Sara Scott will attend to contribute to the overall international GNEP Program and efforts. Her attendance at Technical Meeting/Workshop on Milestones for Nuclear Power Infrastructure Development is essential as she is the laboratory lead for infrastructure working group. | AF5850000 |
| NE | SCOTT | SARA | Contractor | LANL | 200801226 | 12/9/2007 | 12/14/2007 | 4,385.00 | Austria | Vienna | Sara Scott will provide support to the Infrastructure Working Group as well as contribute to the overall efforts of the International GNEP Program. | AF5850000 |
| NE | SHEA | THOMAS | Contractor | PNNL | 200801661 | 11/10/2007 | 11/16/2007 | 3,285.94 | Austria | Vienna | Traveler will take part in a IAEA Consultancy Meeting to assist in drafting the document entitled "Viability of Sharing Facilities for Disposal of Spent Nuclear Fuel - Technical and Institutional Considerations". | AF5850000 |
| NE | SIEGEL | ANDREW | Contractor | ANL | 200716607 | 9/16/2007 | 9/20/2007 | 1,074.00 | Japan | Tokyo | The U.S.-Japan Joint Nuclear Energy Action Plan (JNEAP) was signed by U.S. and Japan in April, 2007. This civil nuclear energy action plan builds upon the cooperative research and development discussions that have taken place between U.S. and Japan. This includes cooperation on policies and programs that support the construction and regulation of new nuclear power plants and strengthen the nonproliferation regime. The R&D activities of the Action Plan are designated through 6 GNEP R&D Working Group which are co-chaired by a designated expert from the U.S. and Japan respectively. | AF5855000 |
| NE | SIMPSON | MICHAEL | Contractor | INL | 200717616 | 10/13/2007 | 10/21/2007 | 3,040.32 | Korea | (Other) - Daej | Will participate in 2nd project review meeting for I-NERI project and the Advanced Fuel Cycle Forum meeting. | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | 2,816.62 | Korea | Seoul | Traveler will participate in the US-Korea JSCNEC Conference/meetings and obtain information about potential areas of cooperation for collaborations. | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | | Korea | Taejon | As part of the conference, traveler will tour KAERI facilities in Taejon, South Korea. | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | | Korea | Seoul | Complete participation in the JSNEC Conference/meetings. | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | 3,135.23 | Korea | Seoul | 2/4: Official Stop Over | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | | Korea | (Other) - Daejeon | Participate in discussions relating to the international collaboration to treat commercial nuclear spent fuel, specifically, research & development of advanced dry head-end processes (e.g., voloxidation). Participate in the 5th I-NERI Program Review Meeting. Participate in technical meetings regarding special projects. | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | | Korea | Seoul | 2/9: Official Stop | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | 3,446.77 | Korea | Seoul | 10/15: Official Stop Over enroute to Daejeon, Korea | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | | Korea | (Other) - Daejeon | To attend the 3rd ROK-USA Advanced Fuel Cycle R&D Forum, present a talk on current ORNL activities entitled "Overview of Advanced Fuel Cycle-Related Activities at ORNL" and support the DOE HQ manager for GNEP R&D (Buzz Savage). | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | Official Stop Over enroute back to US | AF5805100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | 9,426.02 | France | Nice | traveler will attend conference and present paper titled: Thermodynamic Models simulations of Nuclear Fuel Materials. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Nice | Traveler is the Primary organizer of this workshop. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | weekend between meetings. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Traveler will attend invitad lecture and meetings at CEA with colleagues. Title of lecture: Models and simulations of Thermodynamic properties of nuclear fuel. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Nobusiness weekend | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Traveler will present talk at conference titled: "Prior Knowledge in Thermodynamic Models and Simulations." | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | Romania | Bucharest | Personal leave. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | 4,168.19 | France | (Other) - Saclay | Traveler will give key note presentation titled: MODELS AND SIMULATIONS OF THERMODYNAMIC PROPERTIES AND TRANSPORT PHENOMENA | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | Paris | non-business days | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | (Other) - Grenoble | Traveler will attend a meeting to discuss experimental techniques and collaboration at Institut National Polytechnique de Grenoble (INPG). | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | (Other) - CADARACHE | Traveler will give an invited seminar titled: MODELS AND SIMULATIONS OF THERMODYNAMIC PROPERTIES OF NUCLEAR FUELS. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | 4,466.00 | France | Aix-en-Provence | en-route and jet lag day | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | | France | Aix-en-Provence | Presentation of Los Alamos results in the area of materials for nuclear energy and discussion of US/France bilateral collaboration. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | | France | Aix-en-Provence | INERI International Nuclear Energy Research Initiative Meeting. Traveler will present LANL proposal titled: Nuclear Fuel Performance discussions. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716636 | 9/16/2007 | 10/6/2007 | 9,787.00 | Japan | Tokyo-To | The traveler is a part of the US delegation who will meet with the US-Japan working group on Nuclear Fuels Modeling and Simulation. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716636 | 9/16/2007 | 10/6/2007 | | Japan | Tokyo-To | Collaboration with Dr. Motoyasu Kinoshita. Drs. Stan and Kinoshita and organizers of the Materials Models and Simulations for Nuclear Fuels workshop to be held in December. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716636 | 9/16/2007 | 10/6/2007 | | Russia | (Other) - Nizhny Novgorod | The traveler is an invited presenter at the Advanced Fuel Cycle for 21st Century Conference in cooperation with the International Science and Technology Center (ISTC). The title of his presentation is "Models and Simulations of Advanced Nuclear Fuels". | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716636 | 9/16/2007 | 10/6/2007 | | Romania | Bucharest | PERSONAL LEAVE | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200803396 | 1/13/2008 | 1/18/2008 | 4,835.00 | France | Paris | Fuels and materials for nuclear energy. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200803396 | 1/13/2008 | 1/18/2008 | | France | Paris | Meeting with Nuclear Energy Agency Staff. | AF5810100 |

TRAVEL BY NA, NE, NA, AND SY
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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200617251 | 10/21/2006 | 10/26/2006 | 2,065.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program ENIGMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code previously proposed by Argonne will be discussed. | AF5820100 |
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200707454 | 5/12/2007 | 5/17/2007 | 4,863.00 | France | Nice | U.S. is considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for long term growth of nuclear power and non-proliferating nuclear utilization internationally. Special sessions have been organized for area of Fuel Cycle and Waste Management along with others. This forum provides opportunity for traveler to exchange information with international meeting participants in areas of advanced nuclear systems and fuel cycle strategies being considered by these countries. Traveler will present as a Keynote Speaker the results of recent studies conducted in U.S. and Canada on advanced thermal-burner reactors. | AF5830100 |
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200715133 | 8/18/2007 | 8/22/2007 | 3,246.13 | France | Paris | The U.S. is considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for the long-term growth of nuclear power and non-proliferating nuclear utilization internationally. A new OECD/NEA "Ad Hoc Expert Group on Transition Scenarios from Thermal to Fast Reactors" is being convened to conduct a comprehensive analysis of issues that might arise during transition from the currently operating thermal reactors (LWRs) to rapid deployment of fast neutron systems. The group will focus on issues of interest to policymakers, by analyzing mass flows, management of fissile materials, etc. | AF5830100 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | 8,400.00 | France | [Other] - Saclay | Geometry and mesh generation is key enabling technology for simulations in both fusion and fission nuclear power. I will collaborate with personnel at the CEA Saclay site to integrate geometry and meshing technology into the French TRIPOLI Monte Carlo transport code. I will also work with the Salome team as part of an ongoing collaboration on reactor simulation. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | Marseille | Timothy Tautges has been invited to give a short course on his SciDAC work. This could result in other researchers building on the functional interfaces I have developed, which would result in components which could be leveraged at Argonne National Laboratory. During the Research Center portion of this program, I will jointly investigate the mathematical basis for hex mesh modification. This problem is important for simulations in both SciDAC and nuclear energy applications. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | [Other] - Cadarache | During this time, Timothy Tautges will be in France under a separate 551.1 form, traveling for a program under ORNL. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | Marseille | Timothy Tautges has been invited to give a short course on his SciDAC work. This could result in other researchers building on the functional interfaces Tautges has developed, which would result in components which could be leveraged at Argonne National Laboratory. During the Research Center portion of this program, Tautges will jointly investigate the mathematical basis for hex mesh modification. This problem is important for simulations in both SciDAC and nuclear energy applications. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | [Other] - St. Paul Les Durance | Timothy Tautges will meet with personnel performing reactor simulation code development, relevant to his GNEP work. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200801873 | 12/1/2007 | 12/5/2007 | 453.00 | France | Paris | Present work on hexahedral mesh generation and explore collaboration on the subject. Hexahedral meshes are used in the Argonne National Laboratory GNEP reactor simulation, particularly for fluid flow simulations. | AF5830000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200801873 | 12/1/2007 | 12/9/2007 | | France | [Other] - Chalette-sur-Loing | Present work on hexahedral mesh generation and explore collaboration on the subject. Hexahedral meshes are used in the Argonne National Laboratory GNEP reactor simulation, particularly for fluid flow simulations. | AF5830000 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | 9,393.00 | France | Nice | Traveler will present on "Advanced Safeguards Research and Development Plan with an Emphasis on Its Impact" | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Enroute/Arrival | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Nonbusiness/Weekend | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Tour of Cadarache NDA labs | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Traveler will present on "A Survey of Seven Measurement Techniques for Quantifying the Fissile Content in Spent Fuels" | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | [Other] - Avignon | Team will conduct an AREVA tour at Marcoule | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | [Other] - Avignon | Nonbusiness/Weekend | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | [Other] - Cherbourg | Enroute/Arrival | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708076 | 5/12/2007 | 5/29/2007 | | France | [Other] - Cherbourg | Team will conduct an AREVA tour at La Hague. | AF5830100 |
| NE | TODD | TERRY | Contractor | INL | 200704648 | 3/11/2007 | 3/17/2007 | 3,931.25 | Russia | [Other] - Obninsk | US and Russia experts meeting on Civil Nuclear Energy. Participate as a subject matter expert in fuel cycle and separations. Meeting is a follow-on to a joint US/ Russia collaborative agreement to expand global and bilateral nuclear energy cooperation, signed by President Bush and President Putin in December, 2006. | AF5810000 |
| NE | TODD | TERRY | Contractor | INL | 200707439 | 4/29/2007 | 5/5/2007 | 5,043.72 | United Kingdom | Manchester - Sellafield | Presentation on INL and INL Separations and Radiochemistry activities will be made to Nexia Solutions. Topics of Advanced Fuel Cycle and Process Simulation will be discussed. Plant tours of Sellafield and Thorp will be taken. Goals: Establish technical topic areas for considerations of potential collaboration with INL. | AF5805100 |
| NE | TODD | TERRY | Contractor | INL | 200711324 | 5/25/2007 | 6/2/2007 | 3,046.72 | Austria | Vienna | Attending the second US-Russian Civilian Nuclear Energy Working Group Meeting. | AF5810000 |
| NE | TOOOSOW | MICHAEL | Contractor | BNLEE | 200709125 | 5/18/2007 | 5/26/2007 | 8,472.95 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. Traveler will presenting a paper entitled "Neutronic Thermal-Hydraulics Studies of Transmutation Fuels" General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts | AF5810100 |
| NE | TOOOSOW | MICHAEL | Contractor | BNLEE | 200709125 | 5/18/2007 | 5/26/2007 | | Russia | [Other] - Samara | Official Stop over enroute to airport via U.S. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200706487 | 4/14/2007 | 4/28/2007 | 3,914.19 | France | Aix-en-Provence | Discussion will be held regarding the metal and nitride fuel types fabricated in the US and the decision by the French safety authority regarding the suitability of these fuels for irradiation. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | 4,877.50 | Russia | Moscow | Train from Moscow to Dimitrovgrad (Ulyanovsk region) | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | | Russia | [Other] - Ulyanovsk | The traveler is an expert in the area of advanced ceramic nuclear fuels and will deliver three presentations at the 8th Russian Conference on Reactor Material Science. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | | Russia | Moscow | return back to US | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200800368 | 12/2/2007 | 12/8/2007 | 2,878.00 | Japan | [Other] - Oarai | Site visits- Japan Atomic Energy Agency (JAEA) Naka/ Tokai. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200800368 | 12/2/2007 | 12/8/2007 | | Japan | [Other] - Oarai | Attend Technical specialists meeting to discuss fuel fabrication and characterization for GACID agreement. | AF5810100 |
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200603512 | 2/21/2006 | 2/28/2006 | 4,455.12 | Korea | Seoul | Travelers will stop over in Seoul before traveling on to Daejeon. | AF5805000 |
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200603512 | 2/21/2006 | 2/28/2006 | | Korea | [Other] - Daejeon | Participate in the design review of the next generation voloxidation equipment for the Korean I-NERI project "Development of Voloxidation Process for Treatment of LWR Spent Fuel." Technical and planning meetings will be held with leaders from the INL and KAERI. | AF5805000 |

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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200803512 | 2/21/2006 | 2/26/2006 | | Korea | Seoul | Travelers will stay in Seoul in order to catch early flight out back to US. | AF5805000 |
| NE | WALLACE | RICHARD | Contractor | LANL | 200718314 | 10/8/2007 | 10/13/2007 | 5,329.00 | Russia | [Other] - Obninsk | Attend Workshop on Fast Reactors and Liquid Metals in Power Industry of the 21st Century in Obninsk, Russia. | AF5850000 |
| NE | WIGELAND | ROALD | Contractor | ANL | 200615764 | 9/23/2006 | 9/30/2006 | 2,878.00 | France | [Other] - Nimes | Presentation of an invited paper detailing the reprocessing and recycling requirements necessary to obtain waste management benefits in a geologic repository, which forms the basis of one of the fundamental US-DOE GNEP program objectives. | AF5830100 |
| NE | WILLIAMS | KENT | Contractor | ORNL | 200617608 | 10/14/2006 | 10/21/2006 | 3,900.21 | Austria | Vienna | Technology issues and options for global deployment of small & medium sized reactors. Topics on economics, safety, emergency planning, and reactor technologies for SMRs is relevant to IRIS project (ORNL is participant) and GNEP (ORNL is expected to be participant). | AF3650200 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | Overnight stay prior to departure for Daejeon | AF5800000 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | 3,158.00 | Korea | [Other] - Daejeon | Third Republic of Korea (ROK) - USA Advanced Fuel Cycle R&D Forum. Serve as a technical representative on pyrochemical processing for Department of Energy, Office of Advanced Nuclear Energy Research. | AF5800000 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | Overnight stay prior to departure for U.S. | AF5800000 |
| NE | YANG | WON | Contractor | ANL | 200607421 | 5/27/2006 | 6/3/2006 | 2,809.23 | France | [Other] - Cadarache/Aix-en-Prove | Workshop for "Modeling Advanced Nuclear Systems with the ERANOS Code" will provide good opportunity to access ERANOS code system for Advanced Burner Test Reactor (ABTR) and Advanced Burner Reactor (ABR) design applications | AF5830100 |
| NE | YANG | WON | Contractor | ANL | 200614199 | 9/10/2006 | 9/15/2006 | 2,843.00 | Canada | Vancouver | PHYSOR-2006 will allow discussing most important scientific results obtained worldwide in reactor physics area; traveler is Argonne manager responsible for Reactor and Fuel Cycle Analyses; he is responsible for design and analysis of advanced Gen IV nuclear systems, with primary focus on ABTR; will deliver paper on sodium-cooled fast reactor (SFR) design studies and chair session on reactor physics methods; obtain activities ongoing internationally in areas of reactor physics methods and SFR design studies. | AF5810100 |
| NE | YANG | WON | Contractor | ANL | 200617171 | 10/21/2006 | 10/26/2006 | 2,121.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program ENIGMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code previously proposed by Argonne will be discussed. | AF5820100 |
| NE | YANG | WON | Contractor | ANL | 200708171 | 5/12/2007 | 5/12/2007 | 5,428.00 | France | Nice | U.S. considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for long term growth of nuclear power and non-proliferating nuclear utilization internationally. Three sessions have been organized in ICAPP 2007 for area of Sodium-cooled Fast Reactors, along with those of others (Fuel Cycle and Waste Management, etc.). Forum provides opportunity to exchange information with international meeting participanes in areas of advanced sodium-cooled fast reactor systems and fuel cycle strategies being considered by these countries. Traveler will present results of ABTR core design studies conducted in U.S. | AF5855000 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200608559 | 5/28/2006 | 6/5/2006 | 2,343.38 | Austria | Vienna | Attend the Meetings of the Technical Working Group on Nuclear Fuel Cycle Options and Spent Fuel Management (TWG/NFCO) at IAEA, Vienna. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200615349 | 9/26/2006 | 9/29/2006 | 1,839.64 | Canada | Ottawa | Attend Nuclear Energy Research Initiative meeting. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200707885 | 4/20/2007 | 4/28/2007 | 3,220.86 | France | Aix-en-Provence | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboration annual review. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200713630 | 8/11/2007 | 8/17/2007 | 5,981.34 | Russia | Saint Petersburg | Discussion will center on the potential for U.S. participation in the design of a modern pilot-scale reprocessing plant to be built at Krasnoyarsk-26, Russian Federation. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200715512 | 10/5/2007 | 10/13/2007 | 5,981.34 | Austria | Vienna | Present Global Nuclear Energy Partnership paper at IAEA Working Group on Nuclear Fuel Cycle Options. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200715512 | 10/5/2007 | 10/13/2007 | | Russia | Saint Petersburg | Participate in feasibility study at Khlopin Radium Institute. | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200609085 | 4/22/2006 | 4/27/2006 | 1,114.35 | Belgium | Brussels | ATTEND MEETINGS WITH THE CENTRE (WITH MARK GINSBERG) TO DISCUSS ADMINISTRATION POLICY OF VOLUNTARY ACTIONS TO HELP ACHIEVE CLIMATE CHANGE. | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611295 | 5/30/2006 | 6/2/2006 | 2,043.57 | Canada | Ottawa | Discussions with AECL, Canada on GENIP cooperation and tour of CANDLE reactor. | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611382 | 6/12/2006 | 6/12/2006 | 463.75 | Canada | Toronto | ATTEND CANADIAN NUCLEAR SOCIETY CONFERENCE TO PROVIDE AN UPDATE ON THE GLOBAL NUCLEAR ENERGY PARTNERSHIP INITIATIVE. | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611395 | 6/17/2006 | 6/23/2006 | 2,401.24 | Austria | Vienna | U.S Representative to International Atomic Energy Agency Conference on Management of Spent Fuel from Nuclear Power Reactors in cooperation with the OECD Nuclear Energy Agency. | KK0501211 |
| NE | CLAPPER | MAUREEN | DOE Federal Employee | NE | 200605906 | 2/25/2006 | 3/1/2006 | 2,244.52 | Austria | Vienna | Brief IAEA on the Global Nuclear Energy Program. | KK0501211 |
| NE | CLAPPER | MAUREEN | DOE Federal Employee | NE | 200716350 | 9/13/2007 | 9/21/2007 | 3,654.47 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | DICKENS | SHERRI | DOE Federal Employee | NE | 200716351 | 9/13/2007 | 9/17/2007 | 2,434.21 | Austria | Vienna | Provide support for the GNEP Ministerial Conference. | KK0501211 |
| NE | DICKENS | SHERRI | DOE Federal Employee | NE | 200801362 | 12/7/2007 | 12/14/2007 | 3,764.10 | Austria | Vienna | Attend and provide logistical and credentialing support for the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | GILLESPIE | MARY | DOE Federal Employee | NE | 200707618 | 3/31/2007 | 4/8/2007 | 11,276.48 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U.S./Japan Action Plan on Nuclear Energy. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200608439 | 4/11/2006 | 4/12/2006 | 2,360.71 | Canada | Ottawa | Meetings with the Canadians regarding the Global Nuclear Energy Partnership (GNEP). | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200609279 | 5/29/2006 | 6/2/2006 | 1,982.99 | Switzerland | Zurich | Attend MEGAPIE Steering Committee meeting. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200616226 | 9/17/2006 | 9/30/2006 | 4,967.55 | Germany | Frankfurt am Main | Visit laboratories regarding advanced transmutation fuel development. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200616226 | 9/17/2006 | 9/30/2006 | | France | Paris | Participate in OECD/NEA meeting on actinide and fission product partitioning and transmutation. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200618069 | 10/13/2006 | 10/21/2006 | 2,967.27 | Japan | Tokyo-To | Promotion of GACID and Joyo for the Japan/France/United States Trilateral Collaboration Project. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200707886 | 4/18/2007 | 4/27/2007 | 3,312.30 | France | Paris | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboration annual review. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200709475 | 6/1/2007 | 6/9/2007 | 3,475.39 | Japan | Tokyo City | To participate in Global Actinide Cycle International Demonstration (GACID)and JOYO meetings. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200711793 | 5/24/2007 | 6/29/2007 | 2,562.29 | Austria | Vienna | To attend the second US/Russia workshop on civil Nuclear Energy Cooperation. In accordance with the Dec. 15th 2007 US/Russia Action plan. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/28/2007 | | Germany | Frankfurt am Main | Participate in MEGAPIE Steering Committee meeting. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/29/2007 | 2,159.48 | Germany | [Other] - Karlsruhe | Visit Karlsruhe Energy Research Center. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/29/2007 | | Switzerland | Bern | Attend meetings with Paul Scherrer Institute regarding GNEP. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200706001 | 4/2/2007 | 4/6/2007 | 2,150.27 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U.S./Japan Action Plan on Nuclear Energy. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200707827 | 4/22/2007 | 4/28/2007 | 3,048.52 | France | Paris | Attend the 114th Session of the Steering Committee for Nuclear Energy at OECD/NEA. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200713485 | 7/16/2007 | 7/26/2007 | 2,551.54 | Switzerland | Bern | To discuss IRR concept and attend the GIF meeting. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200716420 | 9/14/2007 | 9/20/2007 | 2,729.41 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200716420 | 9/14/2007 | 9/20/2007 | | Austria | Vienna | | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200801229 | 11/18/2007 | 11/20/2007 | 5,359.38 | Japan | Tokyo City | To attend an Executive Committee Meeting "Japanese Fuel Cycle Management meeting | KK0501211 |

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01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | GRIFFITH | ANDREW | DOE Federal Employee | NE | 200706688 | 4/20/2007 | 4/27/2007 | 4,492.82 | Japan | Nagoya | Participate in the 15th International Conference on Nuclear Engineering (ICONE15). | KK0501211 |
| NE | GROSS | JOHN | DOE Federal Employee | NE | 200715372 | 8/31/2007 | 9/4/2007 | 3,326.94 | Belgium | Brussels | Attend International Conference on Environmental Remediation and Radioactive Waste Management Conference. | KK0501211 |
| NE | GUITH | CHRISTOPHER | DOE Federal Employee | NE | 200716271 | 9/12/2007 | 9/26/2007 | 3,786.56 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200604785 | 2/7/2006 | 2/14/2006 | 2,357.01 | France | Paris | Technical discussions on GNEP initiative with Commissariat a l'Energie Atomique (CEA) and DOE. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200605741 | 2/25/2006 | 3/1/2006 | 4,870.90 | Japan | Tokyo | Technical discussions on GNEP initiative with Japan. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200606740 | 3/22/2006 | 3/29/2006 | 4,522.08 | United Kingdom | London | Technical discussion on GNEP initiative with UK and DOE. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200606740 | 3/22/2006 | 3/29/2006 | 10,260.68 | Russia | Moscow | Technical discussion on GNEP initiative with Russia and DOE. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200610749 | 5/19/2006 | 5/27/2006 | | China | Beijing | Technical discussions on GNEP initiative with Chinese officials. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200610749 | 5/19/2006 | 5/27/2006 | | Japan | Tokyo | Technical discussions on GNEP initiatives with Japanese officials | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200614815 | 8/18/2006 | 8/22/2006 | 2,292.83 | Japan | Tokyo City | Global Nuclear Energy Partnership (GNEP) Collaborative Research and Development Separations and Reactor Technology meetings with Japan Atomic Energy. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200701343 | 11/14/2006 | 11/17/2006 | 1,934.81 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENTS BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200706678 | 3/11/2007 | 3/16/2007 | 2,881.58 | Russia | [Other] - Obninsk | First U.S./Russia Workshop on International Cooperation under the Joint Action Plan | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200709171 | 6/10/2007 | 6/16/2007 | 2,381.11 | France | Paris | To attend annual OECD/NEA Nuclear Science Committee Meeting and hold initial discussions with CEA on GNEP. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200711794 | 6/24/2007 | 6/29/2007 | 2,878.17 | Austria | Vienna | To attend the second US/Russia workshop on civil Nuclear Energy Cooperation, in accordance with the Dec. 15th 2007 US/Russia Action plan. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200713487 | 7/10/2007 | 7/13/2007 | 3,143.64 | China | Beijing | To meet withs the Chinese Government to discuss preparations for the May 21 international meeting on GNEP that Chairman Ma Kai was invited to attend by Secretary Bodman. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200802195 | 11/25/2007 | 11/29/2007 | 3,020.62 | China | Beijing | Hold first GNEP Action Plan Technical Cooperation meeting per the U.S./China Plan Appendix | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200802026 | 12/9/2007 | 12/14/2007 | 3,151.86 | Austria | Vienna | Attend GNEP Steering Group Meeting. | KK0501211 |
| NE | KNOX | GREGORY | DOE Federal Employee | SY | 200713736 | 7/14/2007 | 7/18/2007 | 2,209.16 | Austria | Vienna | Meeting with IAEA and Austria Conference Center staff to discuss logistics and a walk-thru for the September GNEP Ministerial meeting. | KK0501211 |
| NE | KNOX | GREGORY | DOE Federal Employee | SY | 200716167 | 9/9/2007 | 9/19/2007 | 4,385.99 | Austria | Vienna | To support the GNEP Ministerial Meeting. | KK0501211 |
| NE | LAHNEMAN | WILLIAM | DOE Federal Employee | NE | 200801593 | 12/5/2007 | 12/14/2007 | 4,186.32 | Austria | Vienna | Participate in the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | | Japan | Tokyo | Participate in the 3rd Meeting of the GNEP Waste Management Group. | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | 3,385.46 | Japan | [Other] - Mito | Participate in a Site tour with the GNEP Waste Management Group. | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | | Japan | [Other] - Nagoya | GNEP Waste Management Site tour. | KK0501211 |
| NE | LISANN | ELIZABETH | DOE Federal Employee | NE | 200801368 | 12/5/2007 | 12/14/2007 | 4,571.16 | Austria | Vienna | Attend and provide logistical and credentialing support for the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200701995 | 12/1/2006 | 12/8/2006 | 3,013.23 | Austria | Vienna | Attend workshop on Issues for the Introduction of Nuclear Power and discuss infrastructure requirements with IAEA staff. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200713488 | 7/16/2007 | 7/20/2007 | 2,418.44 | Switzerland | Bern | To discuss IRR concept and attend the GIF meeting. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200716559 | 9/14/2007 | 9/20/2007 | 3,128.83 | Austria | Vienna | Attend IAEA General Conference. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200801641 | 11/10/2007 | 11/20/2007 | 0.00 | Japan | Tokyo City | To attend an Executive Committee Meeting "Japanese Fuel Cycle Management meeting. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200706875 | 10/24/2006 | 10/28/2006 | 986.00 | Russia | Moscow | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENT S BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS WILL ALSO BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200701336 | 11/14/2006 | 11/19/2006 | 2,295.49 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENTS BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200702215 | 12/1/2006 | 12/12/2006 | 3,550.32 | Austria | Vienna | Attend workshop on Issues for the Introduction of Nuclear Power and discuss infrastructure requirements with IAEA staff. Traveler will take leave 12/7-8/06. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200707765 | 3/31/2007 | 4/6/2007 | 8,639.41 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U.S./Japan Action Plan on Nuclear Energy. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200713955 | 7/10/2007 | 7/13/2007 | 15,176.98 | China | Beijing | To meet withs the Chinese Government to discuss preparations for the May 21 international meeting on GNEP that Chairman Ma Kai was invited to attend by Secretary Bodman. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200716548 | 9/13/2007 | 9/29/2007 | 3,197.79 | Austria | Vienna | IAEA conference and GNEP Ministerial Mtg. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200800762 | 11/26/2007 | 12/1/2007 | 0.00 | China | Beijing | Attend meeting with regarding public release of our joint nuclear energy cooperation plan. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200801370 | 12/9/2007 | 12/14/2007 | 2,640.04 | Austria | Vienna | Chair the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200804533 | 1/15/2008 | 1/18/2008 | 2,580.54 | Turkey | Ankara - Istanbul | Attend meetings with the President of TAEK regarding Global Nuclear Energy Partnership. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200805543 | 2/4/2008 | 2/7/2008 | 1,036.00 | United Kingdom | London | Meet with Melvin Draper and Mark Higson to provide a briefing on GNEP and to discuss other specific issues. | KK0501211 |
| NE | MCLEAN-WHEELER | SHANE | DOE Federal Employee | NE | 200716270 | 9/12/2007 | 9/20/2007 | 3,592.91 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200612394 | 10/14/2006 | 10/19/2006 | 2,363.83 | Austria | Vienna | Attend IAEA Technical Meeting to "Review the Enabling Technology for Small and Medium Sized Reactors (SMRs)" | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200704449 | 2/3/2007 | 2/7/2007 | 2,169.06 | Austria | Vienna | Attend IAEA Consultancy Meeting to review implementation approach to adefine common user criteria for developing and deploying reactors in developing countries. | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200802194 | 12/9/2007 | 12/14/2007 | 2,905.79 | Austria | Vienna | Attend GNEP Steering Group Meeting | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200605740 | 2/25/2006 | 3/4/2006 | 8,344.16 | Japan | Tokyo | Technical discussions on GNEP initiative with Japan. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200606802 | 3/22/2006 | 3/29/2006 | 3,090.55 | United Kingdom | London | Technical discussion on GNEP initiative with UK and DOE. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200606802 | 3/22/2006 | 3/29/2006 | | Russia | Moscow | Technical discussion on GNEP initiative with Russia and DOE. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200608879 | 4/24/2006 | 4/28/2006 | 10,634.25 | Japan | Tokyo | Attend Japan Atomic Industrial Forum conference and meetings to discuss GNEP. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200610750 | 5/19/2006 | 5/24/2006 | 8,847.65 | China | Beijing | Technical discussions on GNEP initiative with Chinese officials. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200614233 | 8/3/2006 | 8/8/2006 | 10,034.10 | United Kingdom | London | Followup meetings with UK Government regarding the Global Nuclear Energy Partnership | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200617572 | 9/19/2006 | 9/22/2006 | 7,444.43 | France | Paris | Meetings w/CEA officials J. Bouchard, P. Pradel, and others regarding GNEP. Also give lecture at CEA managers conference. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | | Korea | Seoul | Stay over in Seoul before flying on to Daejeon. | KK0501211 |

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01/01/06 - 02/15/06

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | 2,828.46 | Korea | [Other] - Daejeon | Work with State Department to perform a review of KAERI's programs in both pyroprocessing and DUPIC. KAERI would like to have the opportunity to discuss areas for additional collaborations. Also participate in discussions about the use of spent fuel in their new hot cell facility. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | | Korea | Seoul | Overnight stay en route to U.S. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200605585 | 3/11/2006 | 3/16/2006 | 2,444.24 | France | Paris | Meetings with CEA on France-Japan collaborations on global actinide cycle international demonstration in Monju reactor and trilateral collaboration into advanced reprocessing technology. Also continuation of negotiations and program planning activities ongoing from fiscal year 2005 | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200614817 | 8/18/2006 | 8/22/2006 | 2,264.99 | Japan | Tokyo City | Global Nuclear Energy Partnership (GNEP) Collaborative Research and Development Separations and Reactor Technology meetings with Japan Atomic Energy. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200618870 | 10/13/2006 | 10/21/2006 | 2,837.70 | Japan | Tokyo-To | Promotion of GACID and Joyo, Japan/France/United States Trilateral Collaboration Project. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200717851 | 10/12/2007 | 10/20/2007 | 3,577.71 | Korea | Seoul | Attend and participate in the U.S./Korea I-NERI Annual Review. | KK0501211 |
| NE | SCHUPPNER | SUIBEL | DOE Federal Employee | NE | 200615023 | 9/26/2006 | 9/29/2006 | 1,889.31 | Canada | Ottawa | Participate in the U.S.-Canada International-Nuclear Energy Research Initiative (I-NERI) Annual Review Meetings. | KK0501211 |
| NE | SCHUPPNER | SUIBEL | DOE Federal Employee | NE | 200706189 | 4/24/2007 | 4/28/2007 | 2,332.52 | France | Aix-en-Provence | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboraiion annual review. | KK0501221 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200703991 | 4/1/2007 | 4/3/2007 | 1,855.85 | Canada | Ottawa | Meeting on fuel cycle and the Global Nuclear Energy Partnership. | KK0501211 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200713157 | 7/14/2007 | 7/18/2007 | 2,456.92 | Austria | Vienna | Meet with IAEA and Austria Conference Center staff to discuss logistics and do a walk-thru for the September GNEP Ministerial meeting. | KK0501211 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200716359 | 9/9/2007 | 9/19/2007 | 4,243.00 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | SINGH | BHUPINDER | DOE Federal Employee | NE | 200600746 | 12/7/2007 | 12/13/2007 | 2,970.88 | Austria | Vienna | Participate in IAEA Technical Meeting on Development Needs for Deployment of Advanced Fuel Cycles. | KK0501211 |
| NE | SPURGEON | DENNIS | DOE Federal Employee | NE | 200700936 | 11/14/2006 | 11/18/2006 | 2,777.13 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENT'S BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | SPURGEON | DENNIS | DOE Federal Employee | NE | 200715604 | 9/13/2007 | 9/20/2007 | 4,014.03 | Austria | Vienna | Attend IAEA General Conference. | KK0501211 |
| NE | STOUT | DANIEL | DOE Federal Employee | NE | 200800216 | 10/13/2007 | 10/19/2007 | 3,367.50 | France | Paris | Tour LaHague, Melox, and Phenix facilities. | KK0501211 |
| NE | SZYMANSKI | WILLIAM | DOE Federal Employee | NE | 200801367 | 12/9/2007 | 12/14/2007 | 2,720.96 | Austria | Vienna | Attend and present information on the Nuclear Fuel Services Working Group for the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | SZYMANSKI | WILLIAM | DOE Federal Employee | NE | 200805542 | 2/4/2008 | 2/7/2008 | 1,936.00 | United Kingdom | London | Meet with Melvin Draper and Mark Higson to provide a briefing on GNEP and to discuss other specific issues. | KK0501211 |
| NE | JACOBS | JENNIFER | Other Federal Employee | NE | 200608440 | 4/12/2006 | 4/12/2006 | 1,376.75 | Canada | Ottawa | Meetings with the Canadians regarding the Global Nuclear Energy Partnership (GNEP). | KK0501211 |



"OFFICIAL USE ONLY"

Secretary BODMAN. I have what you have at least—I think a list of numbers of trips done by nuclear energy, by NNSA, and by the management office. It is about $1 million for the nuclear energy; $34,000 for NNSA; and $13,000 for the management office.

Mr. VISCLOSKY. Mr. Secretary, I have not a lot, but some additional questions to ask. We will have a series of three votes here and be back as quickly as possible. We will be back.

Secretary BODMAN. Do you have any estimate of what your timing would be?

Mr. SIMPSON. About 45 minutes.

[Recess.]

SPENT FUEL STORAGE

Mr. SIMPSON. How much are we spending to pay utilites to store fuel that we were supposed to take over? Because of the agreement. Do you know how much were the payments in penalties to pay those utilities?

Secretary BODMAN. I do not.

Mr. SIMPSON. Are they paid by the judgment fund?

Secretary BODMAN. That comes out of the judgment fund in the Justice Department.

Mr. SIMPSON. I would be interested in knowing what we are paying in total penalties and what it is costing those utilities to maintain those storage facilities and keep that, if part of it is penalty, if part of it paying for it, or whatever. At some point in time, it is better for us to take it over, and cheaper probably to take it over, which gets to Yucca Mountain.

Secretary BODMAN. With respect to Yucca Mountain, that which I haven't said, sir, before, but I would say it now, we need access to the waste fund that is in the Treasury.

Mr. SIMPSON. Right.

Secretary BODMAN. That has been an ongoing discussion that we have had with our friends at OMB.

Mr. SIMPSON. We had a hearing in the Budget Committee last year on all of these funds, these dedicated funds, not only within the nuclear waste fund, but others. Unfortunately, they are being used to offset the size of the deficit and we are not spending those monies—harbor maintenance funds—you go through them all; transportation fund. And I think you are going to see us maybe hold some hearings on that within some of these committees. If we are not going to spend it on what it is appropriated for, then we ought to not collect it.

Secretary BODMAN. As a citizen, sir, I agree with you.

Mr. SIMPSON. Yes. So we are going to be looking at that, and I know you need access to that. We directed you in our report language last year to start looking at interim storage. What are we doing with that? Are we going to have a report on interim storage?

Secretary BODMAN. We have a report coming out. When is the report on interim storage? We do have a report coming and we are working on it, as directed by the Congress.

Mr. SIMPSON. Okay.

Secretary BODMAN. We are not opposed to it. We are not trying to stiff the committee.

YUCCA MOUNTAIN

Mr. SIMPSON. All we are looking at, frankly, is if Yucca doesn't open—and as you know, it has problems. We are at a stage where we were at one time with the WIPP plant. Nobody thought WIPP would open and all that kind of stuff, and we are kind of at the same stage right now with Yucca Mountain, although it probably poses more challenges.

I am one that firmly believes we have to have Yucca Mountain open and we need to do everything we can to make sure it is open, and we need to put the resources there to do it and make sure that is open on time, even though I know Nevada has the ability to block it in some respects, but I think we can get around those.

Since the space available will only be for half of the DOD waste, what are we doing looking for the next available Yucca Mountain?

Secretary BODMAN. We will have a report on the next available Yucca Mountain that we are committed to getting done on our watch—that is to say during the course of this year we will have a report. It is going to be later on this year that we would have a report on a list of states where—and I take it there is an understanding that it would be on the other side of the Mississippi River, I guess. At least as I understand it, that was the understanding with Congress some time ago.

So I repeat, the hope of GNEP, the goal of GNEP is to deliver a process technology that would substantially reduce the toxicity and the quantity—mostly the toxicity—of the waste that comes out. In other words, we would burn the actinides.

Mr. SIMPSON. And the next Yucca Mountain would be years down the road.

Secretary BODMAN. Well, in fact, if we were to move ahead in a smart fashion, Yucca Mountain would serve for the balance of this century, or close to it.

Mr. SIMPSON. Right, which is why I think the reprocessing is vitally important.

Secretary BODMAN. It is very important.

Mr. SIMPSON. It is one of the reasons, besides the fact that most of the energy is left in the fuel rods.

Secretary BODMAN. It is just in a different chemical form.

Mr. SIMPSON. Exactly. Thank you.

Mr. VISCLOSKY. Mr. Secretary, I don't have any further questions of you. I understand you have an appointment at 12:15 p.m.

Secretary BODMAN. Yes, sir.

Mr. VISCLOSKY. I just would make a couple of observations. I am 58 years old. I have been at this a long time. I used to be on a congressional staff and I can remember when my mentor, Mr. Benjamin, who chaired the Legislative Branch Subcommittee, would have witnesses stay until 4:30 in the afternoon on relatively small accounts because his budget was well under $1 billion.

I don't want to hold you up from your meeting, but I would just make a couple of observations. We have some very significant other issues to cover, and you do have a budget of $25.014 billion.

Secretary BODMAN. Right. I understand that.

Mr. VISCLOSKY. That is a lot of money for 3 hours worth of hearings.

Secretary BODMAN. Yes, it is.

STOCKPILE STEWARDSHIP

Mr. VISCLOSKY. And I would simply point out that the depth of my concern here is severe. I have made my position known on issues such as Stockpile Stewardship, which I support.

Secretary BODMAN. Right.

Mr. VISCLOSKY. But my upset that about the time when four major complexes are about to be finished, all after their time, all over budget. They were taking a hard turn in the road, at least proposed by the administration—well, let's just build a new warhead. And then to find out from a briefing paper that was handed me this morning that one of those four facilities that is not even done yet, that was pursuant to stockpile stewardship, is now slated to be closed in 2025.

I mean, why are we spending money?

Secretary BODMAN. I have no idea. What facility is it?

Mr. VISCLOSKY. It is the Dual Access Radiographic Hydro-Test Facility that is now apparently slated to be closed. It is not even done being built and we are going to close. And we are building these four facilities for Stockpile Stewardship, and then the administration makes a hard turn and says, well no, let's go build a warhead.

I also would point out that we had testimony before the Committee—and this is a serious fundamental issue with billions of dollars at stake—as far as the size and the configuration and the location of the weapons complex. It was indicated to us, without a great deal of I thought urgency, that it was going to be downsized and reconfigured by the year 2030, and this brochure was handed to us in the year 2006.

I do know that given the controversies between this subcommittee and the administration over the last year, that that complex has been changed. Now, now there is no deadline at all. It is simply complex transformation. We would like to have a whole series of questions about those, but they can wait as well.

So we have a vote, and you have a meeting, so we will adjourn the hearing.

Secretary BODMAN. Thank you, sir.

[Questions and answers for the record follow:]

QUESTIONS FROM CHAIRMAN VISCLOSKY

NONCOMPLIANCE WITH CONGRESSIONAL DIRECTION

Chairman Visclosky. Mr. Secretary, I'm sorry to say that over the last several years this Committee has frequently been disappointed with your Department's implementation of congressional direction. In last year's conference report, we made several hard choices and included direction for your Department...direction that the Administration may not have liked. That's too bad, but I frankly don't always agree 100 percent with the compromises we have to make. But when we give the Department an instruction, we expect it to be carried out.

The first issue I want to discuss is one we have talked about many times...the MOX plant. We ended up providing enough new budget authority to bring MOX funding to $394 million in FY 2008. However, since this had changed from a non-proliferation project to an energy project, we decided the program should be managed by Nuclear Energy, and shifted all of the funding out of NNSA. Mr. Secretary, it appears as if NNSA continues to manage the program. We were very clear in our direction. How much longer will it take you to follow it?

Secretary Bodman. I cannot say, because the NNSA Act prevents me from taking action to effectuate the transfer direction contained in the committee report. That is because the 1999 NNSA Act placed the MOX program in the NNSA, and it revoked the Secretary's authority to remove programs from the NNSA. The placement of the MOX program into NNSA was done by law. In contrast, direction of the sort contained in the committee report accompanying the Consolidated Appropriations Act, 2008, is not law, as has been held by the Supreme Court and the court of appeals. Therefore, the direction in the committee report does not give the Secretary authority to overcome the statutory placement of the MOX program in NNSA. As the General Counsel's memorandum of February 22, 2008, indicates, the Department is still examining the legal questions to see if there is any way to carry out this direction.

Chairman Visclosky. Your FY 2009 budget request reverses congressional direction and takes MOX funding back out of Nuclear Energy. Your staff has claimed "legal reasons" for doing so. Would you summarize for the Committee what those reasons are?

Secretary Bodman. The committee report for the Consolidated Appropriations Act, 2008, prompted a review of the matter and some hard thought by the administration in formulating the President's 2009 budget. That review resulted in the judgment that the MOX program remains a nonproliferation and national security matter. As a matter of law, the President is entitled to make any recommendation to Congress, including his budget, that the President considers appropriate. The Congress, of course, is under no obligation to act in conformity with the President's judgment reflected in his recommendation.

Chairman Visclosky. The FY 2008 conference report eliminated prior-year balances for Russian implementation for disposition of weapon-grade plutonium based on planned Fast Reactors. Does your budget in FY 2009 provide funding for this activity? If so, how much?

Secretary Bodman. The FY 2009 budget requests $1 million for the Russian Surplus Materials Disposition program. This funding level is sufficient for the near term because we have a limited amount of carryover funds available which can be used until the United States and Russia complete negotiations on appropriate amendments to the 2000 *Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated As No Longer Required for Defense Purposes and Related Cooperation*. The FY 2009 budget request will support the ongoing level of effort activities (e.g., technical oversight by U.S. laboratories and contractors of existing contracts with Russia) that support implementation of Russia's technically and financially credible plan to dispose of its surplus plutonium.

Chairman Visclosky. Second, the conference report clearly directed that 50 percent of FY 2008 Advanced Fuel Cycle Initiative/GNEP research and development funds, roughly $75 million, are to be made available in an agency-wide solicitation for universities, national laboratories, and commercial entities. Once again, our direction was clear and definite. However, it took your Department two months to figure out what was in the conference report and another month to come up to speak with us about it. It's unfortunate that your Department had gone ahead and allocated funds under the Continuing Resolution in a way that makes following congressional direction difficult. Perhaps if you had consulted with the Committee before doing so, we wouldn't be in this position. Where are you in implementing the direction contained in the conference report?

Secretary Bodman. We fully support competing GNEP R&D and we are working hard to meet the request of Congress contained in the report accompanying the Consolidated Appropriations Act, 2008. We expect to issue a solicitation this fiscal year that will seek industry, university, and national laboratory head-to-head competition for GNEP R&D. We are expediting this activity but it will take several months to complete the selection and award process.

In the interim, we will continue to fund essential R&D only for program continuity, retention of key personnel, and to ensure critical path fuel cycle research and development. We will continue to fund related experiments begun in prior years that are currently being performed in unique national laboratory facilities, such as the coupled end-to-end separations experiments at Oak Ridge National Laboratory, the advanced fuel tests that are being irradiated in the Advanced Test Reactor at Idaho National Laboratory or are undergoing post irradiation examination, and to meet existing obligations. These are costs that build on research begun in previous years, representing significant investments by the government – investments that would be lost if the work was discontinued. We will also continue to fund those activities that were competed and awarded in prior years; specifically, industry consortia cooperative agreements that were awarded in FY 2007 and university Nuclear Energy Research Initiative (NERI) grants that were awarded in FY 2006 and FY 2007. We will compete as many of the remaining funds as possible this fiscal year.

Chairman Visclosky. The FY 2008 Omnibus Bill included $14.8 million in funding and direction to the NNSA to refurbish Building 651 and complete Building 691 at Idaho National Lab for material consolidation and other purposes. Are you aware that the NNSA has informed

the Committee that it does not intend to comply with this congressional direction and wants to use the funding for other purposes?

Secretary Bodman. The NNSA is not proceeding with a reprogramming of $14.8 million for Building 651 and 691.

Chairman Visclosky. Can you explain why so many programs in your Department believe they can ignore congressional direction?

Secretary Bodman. Due to the nature of the activities that the Department must perform to carry out its statutory obligations and missions, there are situations where the DOE must make program decisions that may not be consistent with congressional requests contained in committee reports. The Department seeks to achieve a balance that allows it to continue to achieve risk reduction, and pursue its cleanup goals as well as other equally important priorities.

Chairman Visclosky. What specifically do you intend to do to ensure that the NNSA follows this congressional direction regarding these buildings at the Idaho National Laboratory?

Secretary Bodman. The NNSA is not proceeding with any reprogramming plans that are counter to congressional direction.

Chairman Visclosky. Mr. Secretary, you know very well that five-year budget planning was one of my top priorities when I was Chairman, and it continues to be a priority of this Subcommittee. The House report for FY 2008 contained clear direction requiring the Department to submit updated five-year budget plans concurrent with submission of the FY 2009 budget request. The explanatory statement accompanying the Consolidated Appropriations Act for FY 2008 specifically states that guidance contained in the separate House and Senate reports remains effective unless modified by the explanatory statement. Despite this clear direction, the Department did not submit any five-year budget plans this year. Further, Committee staff has been informed that the Department has no intentions of submitting these five-year plans at any time later this year.

I confess to being surprised at this decision, given that the Department has submitted these five-year budget plans for key DOE programs in the past several years, and done so with the support and participation of the Office of Management and Budget. Was the decision to ignore this congressional direction for FY 2009 made within the Department, or at the OMB? Has the Department considered what the funding consequences may be for blatantly ignoring this and other direction from the Appropriations Committees? Given that the Department is so dismissive of the direction and priorities of this Committee, please explain why we should not be similarly dismissive of your priorities in the budget request?

Secretary Bodman. As I indicated in my testimony, the Department did complete a five-year budget for the National Nuclear Security Administration (NNSA) that was incorporated into their FY 2009 submission delivered in February. This accounts for 36 percent of the Department's budget.

With regard to the non-NNSA portion of our funding, the decision not to submit a FY 2009 five-year plan was not a deliberate attempt to circumvent Committee direction. The decision reflects the consideration of several factors. The first was a review of the previous plans. Although the previous plans gave an indication of how major program efforts fit within the context of the OMB outyear targets, they were not useful for internal benchmarking and planning purposes. The plans also did not consider potential trade-offs of resources between program offices. It was concluded that our process for developing the five-year profiles should change to generate a more meaningful product for multi-year budget formulation similar to that used by the Department of Defense.

The second factor was that it had become increasingly difficult to obtain the necessary clearances for the reports within a timeframe useful for the Subcommittee's deliberations. Currently, the issuance of outyear targets from the Office of Management and Budget occurs subsequent to the finalization of the budget year amounts. This has created a divided process which does not allow for the full integration of planning across several fiscal years in a timely fashion.

For these reasons, the Department decided to focus efforts on implementing a revised process that includes the full participation of the Office of Management and Budget rather than continue the previous process.

The NNSA programs generate a five-year planning budget because the Office of Management and Budget reviews their budget as a national security program, providing them with specific outyear targets that fully consider policy factors.

Chairman Visclosky. The FY 2008 Omnibus Bill provided $49.5 million for an International Nuclear Fuel Initiative. The funding is intended for the U.S. Government's contribution to an international effort to establish a nuclear fuel supply for peaceful means under the International Atomic Energy Agency. Mr. Secretary, what is the current status of this effort? Please tell us what specific actions DOE has taken to implement this Committee's direction.

Secretary Bodman. The Department is making preparations to transfer the funds allocated by Congress to the International Atomic Energy Agency (IAEA). Notification will be in the form of a letter from me to IAEA Director General ElBaradei, indicating that use of the funds is subject to agreement on conditions by the Board of Governors. Recently, the government of Norway pledged $5 million towards this effort, and noted that it would work to gain the commitment of others to raise the required additional $45 million. Further details on establishment of an international fuel bank under IAEA auspices will be included in the report requested by Congress in the 2008 Omnibus bill.

BUDGET PRIORITIES

Chairman Visclosky. Mr. Secretary, what in your budget proposal does the most in the near term to achieve energy independence for our nation and address global climate change for the world?

Secretary Bodman. There are a number of initiatives in the Department's budget proposal that are expected to have major near-term impacts on our energy dependence and on global climate change. For example, continued investments in technology development are leading to near-term market opportunities in several areas, including efficiency technologies, renewable energy, nuclear energy, and clean coal.

Other initiatives with near-term implications are worth noting. The budget supports continued advances in energy efficient solid state lighting (SSL). Through our Save Energy Now (SEN) program, energy savings assessments identify improvements to the Nation's most energy-intensive industrial facilities. If the private sector chooses to implement them, the improvements could lead to reductions in carbon dioxide emissions. We are requesting funds to further improve the applicability of wind energy. We are also requesting $225 million for the Biomass program for technology development and demonstration which is expected to support stated goals and priorities, including the use of 36 billion gallons of renewable fuel by 2022. Moreover, the Department is proposing a $103.4 million budget for advanced hybrid, electric, and plug-in hybrid drive systems with particular attention to energy storage and plug-in hybrids.

The DOE budget proposal for coal technology of $647.5 million is a 25-percent increase over FY 2008, and is the highest budget for coal since 1981. The technologies under development will help coal to continue to play a strategic role in a carbon constrained world by making available advanced $CO_2$ capture technologies that significantly lower cost and demonstrate the safe, permanent storage of $CO_2$ in geologic formations. Carbon capture and storage remains one of the most important climate change thrusts in the DOE RD&D portfolio and is a key to developing advanced, affordable near-zero atmospheric emissions technologies for the clean use of coal.

The Department's Nuclear Power 2010 (NP 2010) program supports the commercial nuclear power industry through cost-sharing activities with private industry to demonstrate key regulatory approval processes to encourage investments in new, advanced nuclear plants in the United States. DOE and the President have increased our initial commitment by nearly doubling NP 2010's 2009 budget, calling on Congress to fund it at $241.6 million to help ensure this important program can complete its work. NP2010 has resulted in nine applications to build and operate new nuclear plants in the United States, with another ten applications expected to be submitted this year. These efforts will help resolve regulatory issues that could potentially delay or derail NRC approval.

Federal loan guarantees are an important element in our near-term efforts to commercialize technologies that address greenhouse gas emissions. In addition to the recent Loan Guarantee Program solicitation that selected 16 potential projects that help commercialize new or innovative technologies that reduce emissions of anthropogenic greenhouse gas emissions or air pollutants, DOE is currently developing an implementation plan consistent with the FY 2008 Energy and Water Development Appropriations Act.

Nearly all of the options to address climate change and energy independence, whether integration of more renewables, growth in nuclear generation, carbon sequestration, or deployment of advanced technologies such as Plug-In Hybrid Electric Vehicles, require a strong and reliable

electricity delivery system to access the Nation's abundant, domestic energy supplies for the benefit of consumers. Thus, the electric grid, although perhaps by itself not the most visible or direct contributor to addressing the issues of climate change or energy independence, is a critical enabler to any future energy scenario. Accordingly, our FY 2009 budget request includes more than $100 million for Research and Development in the Office of Electricity Delivery and Energy Reliability, whose work contributes directly to modernizing the electricity delivery system. If we can achieve a truly modern grid, we can support a diverse supply and delivery of reliable, affordable, and environmentally responsible energy.

SCIENCE

Chairman Visclosky. Mr. Secretary, this year, your request for the Office of Science calls for an increase of $749 million, or nearly 19 percent over last year's appropriation, expanding the funding for the basic science that will underpin future developments in energy technology over the next century. On the other hand, your budget request calls for cuts in funding (after adjusting for inflation) for all the energy technology programs (with the notable exception of nuclear energy) which might have a substantial impact on our energy system in the near to mid-term. These cuts come at a time when the price of oil hovering around $100 a barrel, scientists are telling us that immediate action is needed to confront the specter of climate change, and the best analysis indicates that a broad portfolio of energy options need to be vigorously pursued in short order to address our energy issues. Wouldn't a more balanced approach to energy science and technology R&D be more effective in both addressing our near and long-term energy challenges?

Secretary Bodman. The President's request is a balanced approach. The challenges in energy demand and energy security that we face now and in the future are daunting. There is no silver bullet—no single energy technology is going to meet these challenges—and current technologies will not suffice. Breakthroughs in science are essential to fuel the development of more efficient and cost-effective processes across all our technological projects, but also for the development of fundamentally new energy technology concepts.

Imagine solar photovoltaics with greater than twice the efficiency of current technology and the capability to directly convert sunlight to chemical fuels through artificial photosynthesis. Imagine better energy storage technology enabling solar and wind to provide over 30 percent of the electricity consumed in the United States. Imagine the number of all-electric and plug-in hybrid vehicles on the road exceeding gasoline-powered vehicles. Imagine a closed fuel cycle for nuclear power and bringing the power of the sun and the stars to Earth in the form of controlled fusion energy. In order to realize these possibilities and seize the opportunities before us in the mid- to long-term, we must make investments in basic research now.

There are significant scientific barriers to overcome to develop significantly more efficient and cost-effective technologies, and also address carbon dioxide emissions. These barriers and critical basic research areas were laid out in a series of scientific workshops conducted over that past six years with broad participation from scientists and engineers from universities, national laboratories, and the private sector. These workshops assessed barriers for energy technologies such as solar, biofuels, hydrogen, and advanced nuclear energy systems; but also crosscutting

research areas such as catalysis, superconductivity, electrical energy storage, and materials under extreme conditions. Advances in understanding materials under extreme conditions and the resulting development of new materials, for example, would impact a broad spectrum of energy applications, including nuclear power, fusion energy, fuel cells, and concentrated solar power, where materials must perform under high temperature, pressure, and radiation environments. We also need to better understand the geosciences behind long term nuclear waste and carbon dioxide storage. The workshops have helped inform priority research investment decisions by the Office of Science to focus on areas that have the greatest potential for impacts.

Let me give you one example of where our basic research provided the foundation for an energy technology now embraced by industry. Fundamental studies by A123 Systems of the electronic conductivity of lithium iron phosphate led to the discovery of doping-induced conductivity increases of eight orders of magnitude and development of high power-density lithium ion batteries. Basic Energy Sciences support helped establish the proof-of-concept for this new nanophase material, which then enabled A123 Systems to receive early technology development and demonstration support from DOE's Office of Energy Efficiency and Renewable Energy. A123 System's lithium ion batteries are now used to power electric vehicles such as the Chevy Volt and electric vehicles produced by Th!nk.

The request for the Office of Science covers a portfolio that enables continuous transformational discoveries for energy security. Of the $749-million increased requested in FY 2009, $100 million is for new Energy Frontier Research Centers. These centers will focus on the innovative basic research needed to accelerate scientific breakthroughs to created advanced energy technologies for the 21st Century. We are encouraging the nation's creative and intellectual talent from universities, national laboratories, and the private sector to come together to tackle some of our greatest scientific challenges identified in the scientific workshops discussed above. Awards will be $2 to $5 million per year for an initial 5-year period. More information on the centers is available at http://www.sc.doe.gov/bes/EFRC.html.

A $203-million increase is for ITER—the experimental fusion reactor designed to lead to development of commercial fusion energy. Fusion has enormous potential as an abundant, carbon-free power source cost-competitive with nuclear and coal power. But there are scientific hurdles to overcome in fundamental understanding of plasma science, development of materials for the extreme thermochemical environments and high neutron flux conditions, and predictive capabilities for optimum experimental reactor design. ITER will demonstrate the technical and scientific feasibility of a sustained fusion burning plasma.

A $136-million increase is for construction of next generation facilities such as the National Synchrotron Light Source II at Brookhaven National Laboratory, the Linac Coherent Light Source at the Stanford Linear Accelerator Center, and the 12 GeV Upgrade of the Continuous Electron Beam Accelerator Facility at the Thomas Jefferson National Accelerator Facility. These scientific tools for the research community will offer unmatched capabilities for the study and characterization of matter and materials at the molecular, atomic, and quantum scale. The technologies of the 21st Century will be rooted in the ability to direct and control matter at this level.

A $71-million increase supports more optimal operations of the Office of Science's major scientific user facilities. These facilities are used annually by over 21,000 researchers from universities, the national laboratories, and industry. This suite of facilities and instruments are a pillar of the U.S. scientific enterprise and the envy of the world.

A $265-million increase is for research, including high performance computing with applications that underpin the entire Office of Science portfolio; improved climate modeling and environmental measurement to ultimately inform decisions on climate and technology investments; chemistry and materials sciences; plasma sciences; fundamental systems biology for energy and environmental applications; and high energy and nuclear physics.

The Office of Science budget request provides for world-leading research and research facilities and tools that will drive transformational discoveries not only for scientific breakthroughs needed to create advanced energy technologies for the 21st century, but that will help maintain U.S. leadership in science and innovation. The United States has been a leader in high energy physics and nuclear physics over the past several decades. Unless we maintain strong programs in the United States, we stand to lose U.S. intellectual talent in these and related fields to other countries, as well as students, scientists, and engineers from other countries who would no longer view the U.S. as a destination for world-leading science. These areas of science have historically provided discoveries, fundamental breakthroughs, and technologies with broad impacts on other areas of science and technologies that are an integral part of society today—technological tools and solutions for medicine; fundamental knowledge in physics, chemistry, and materials for today's technology devices; and the instruments and tools that enable researchers to understand how nature works and use that knowledge for new solutions to society's challenges. This requested investment in facilities and research at universities and national laboratories is also essential for cultivating the science and technology workforce needed to meet the future challenges in energy, environment, and national security, and for enabling the United States to remain globally competitive.

The Office of Science FY 2009 request is consistent with the Energy Policy Act of 2005 as well as provisions in both the America COMPETES Act and the Energy Independence and Security Act of 2007, for which Congress has expressed strong support.

Chairman Visclosky. What is your basis for focusing on long-term basic research and nuclear energy and cutting Energy Efficiency and Renewable Energy by $467 million?

Secretary Bodman. The $750-million increase in the budget request for the Office of Science is in line with the trajectory for investment in the physical sciences envisioned in the America COMPETES Act. New scientific developments are necessary to effect the transformational technological changes our society seeks. It is discovery science that will bring about the truly significant and lasting changes that will support our economy and our environment far into the 21st century.

The reduction in funding for Energy Efficiency and Renewable Energy (EERE) is largely attributable to the elimination of the Weatherization Assistance Program (WAP) and $186

million of earmarks. WAP is an income-based grant program that does directly align with DOE's mission.

The FY 2009 request for EERE's is $1.255 billion, $19 million more than the FY 2008 request. Funding for the hydrogen program was reduced due to the transfer of three activities to the Vehicle Technologies program, where other efforts have congruent objectives; and the elimination of funding for hydrogen production from renewables, delivery, and manufacturing R&D in favor of a focus on remaining critical path barriers to fuel cell and hydrogen storage technology readiness. The decrease in the Water program is attributed to the need to evaluate results of the FY 2008 R&D projects and technology assessments before considering further applied research efforts. Aside from these reductions and modest decreases in the Solar program and Industrial Technologies program, the FY 2009 EERE request maintains or increases technology R&D.

Chairman Visclosky. Mr. Secretary, the FY 2009 budget request has significant increases in areas that were clearly not supported by this Committee and the Congress as a whole in the FY 2008 Omnibus Appropriations Bill. In FY 2007, you asked for an increase of $500 million for the Office of Science budget – you got $200 million. Then, for FY 2008, your request included an increase of $600 million for the Science budget – you got $220 million. Now, you're asking for an increase of $750 million for Science. Given recent history, it would seem to be unwise to make operating decisions for the Office of Science now that rely on substantial increases in future funding. Could you describe the growth assumptions used in making operating decisions for FY 2008 and have gone into the allocations you have proposed for your FY 2009 request?

Secretary Bodman. The Office of Science FY 2009 request is consistent with the Energy Policy Act of 2005 and the America COMPETES Act. The request for the Office of Science is 91 percent of the level authorized in the America COMPETES Act which Congress expressed strong bipartisan support for and every member of the House Energy and Water Appropriations Subcommittee voted for. Speaker Nancy Pelosi acknowledged the doubling of the budget for the DOE Office of Science over 10 years as an important part of the majority's Innovation Agenda. Likewise, over 270 higher education and prominent business leaders signed the American Innovation Proclamation, and called upon Congress to double the basic research budgets in the Office of Science, the National Science Foundation, and the National Institute of Standards and Technology.

Despite the recent history of funding the requested investment in the Office of Science basic research and research capabilities is timely and is essential for addressing our nation's energy and environmental challenges and to ensure that the United States remains a leader in science and innovation. The challenges that we face with growing energy demand and environmental concerns are enormous. We know that current technologies are not going to be sufficient to address these challenges. Investments in research are needed now to realize the new technologies and innovative solutions ten to twenty years from now and beyond. Investments in discovery science lead to new knowledge and beneficial applications that impact our quality of life and often cannot be predicted at the outset. We also need to invest in the training of the next-generation scientific and technical workforce and support the research capabilities that will

enable U.S. researchers to work at the cutting-edge of their fields. With out the investment in people and in research tools, we will lose our intellectual talent to other countries.

Chairman Visclosky. Any sustained growth of the Science budget has implications for out-year funding that are substantially above the current base for longer than initially envisioned by the American Competitiveness Initiative. Given the historical trajectory of the DOE budget, can you describe the consequences of this growth across the department – such as the need to shut down any facilities or programs?

Secretary Bodman. The American Competitiveness Initiative is a government-wide Presidential commitment; its proposed growth for Office of Science programs is not predicated upon offsetting reductions in other Department of Energy programs. Our planning assumption is that the Office of Science will be a part of the overall doubling of physical science research through FY 2016, and thereafter, will grow approximately with inflation levels.

WEATHERIZATION PROGRAM ELIMINATION

Chairman Visclosky. Mr. Secretary, you have provided no funds in the budget request for the Weatherization program, a reduction of -$227.4 million below the level enacted in FY 2008. It is my understanding that about 88,400 homes will be weatherized with the funds provided in FY 2008 -- which is about how many homes would be weatherized in FY 2009 if you had kept the program level in the your budget request.

"During the last 30 years, the U.S. Department of Energy's Weatherization Assistance Program has provided weatherization services to more than 5.5 million low-income families. By reducing the energy bills of low-income families instead of offering aid, weatherization reduces dependency and liberates these funds for spending on more pressing family issues. On average, weatherization reduces heating bills by 31 percent and overall energy bills by $358 per year at current prices. This spending, in turn, spurs low-income communities toward job growth and economic development." Mr. Secretary – this is from the DOE website. Mr. Secretary, why have you zeroed out the Weatherization program?

Secretary Bodman. Income-related weatherization assistance is a good and worthwhile objective for a great and generous nation. It is not a question of whether to do it, but how to do it, where it belongs in the budget, and how effectively it achieves its objectives. After almost three decades, we have weatherized about 5.5 million homes out of the 27 million annually eligible. The delta between eligible homes and homes that the Department reaches through the Weatherization Assistance Program (WAP) is static. It is clear that WAP activities are not aligned with DOE's mission and the program can not compete on a rate of return basis with the applied energy R&D portfolio. That R&D portfolio is committed at a mission level to enhancing our nation's energy security. Year after year this discussion takes place because, based on the metrics of rate of return, WAP cannot compete with all of the other things in which Congress has us investing.

WEATHERIZATION VERSUS NP 2010

Chairman Visclosky. Mr. Secretary, the FY 2009 budget request for the Nuclear Power 2010 or "NP 2010" program in the nuclear energy research account is $241.6 million. This is an increase of $108 million over the FY 2008 enacted level. Can you tell me the names of the recipients of the $241.6 million, if appropriated?

Secretary Bodman. The appropriations would fund the federal cost share of activities to be executed by Dominion Nuclear North Anna, LLC; NuStart Energy Development, LLC, a consortium of 10 power generation companies operating over 60 percent of U. S. nuclear power plants; Westinghouse Electric Company; and GE-Hitachi Nuclear Energy Americas. Of the request, $500,000 will support activities for our Standby Support Program and other Energy Policy Act of 2005 financial incentives for nuclear facilities.

Chairman Visclosky. Mr. Secretary, can you tell me what the Nuclear Power 2010's budget baseline projected the FY 2009 needs to be? So, it appears that the Nuclear Power 2010 request for FY 2009 is an increase of +$92.1 million over your own program baseline from October 2007? I would like to summarize the budget priorities put forth in your request: acceleration of payments to nuclear utility operators, up +$92.1 million over your own baseline for FY 2009, for a total of +$241.6 million; funds to weatherize 84,000 homes for low-income families and the elderly = zero, down -$227 million from FY 2008.

Secretary Bodman. The original December 2005 baseline projected funding needs for FY 2009 were $134.1 million. This level of funding did not address changes that have occurred since the original baselines were submitted by our industry partners in both the regulatory and reactor technology design standardization activities necessary to achieve an industry decision to build new nuclear plants.

The following table provides a detailed breakout of the FY 2009 request above the previous baseline funding levels:

| **($000)** | **FY 2009** |
|---|---|
| **Total NP2010 Additional Funding** | **92,150** |
| | |
| **Increased Regulatory Costs** | **60,275** |
| NRC Fee Increase | 8,060 |
| Increased Response to RAIs | 8,800 |
| DCWGs for Standardized Designs | 1,000 |
| Increased Standardization in Design Certifications | 3,750 |
| Revisions to NRC regulations and guidance | 4,500 |
| New NRC Requirements | 18,500 |
| NRC Required Increased Design Detail | 13,665 |
| State Regulatory Requirements | 2,000 |

| | |
|---|---|
| **Increased Design Standardization** | **31,875** |
| Equipment Selection/Qualification | 15,125 |
| Human Factors Engineering/I&C Standardization | 9,850 |
| Construction Modularization | 6,900 |

The DOE cost-share primarily supports the development and implementation of the untested regulatory process for the combined Construction and Operating Licenses (COL) applications for two new nuclear plants. Since the 2005 baseline estimates were prepared, NP 2010 has evolved from a "demonstration" program to become the centerpiece of two Design Centered Working Groups on which COL applications for ten or more plants (most are twin units) will rely.

The additional funding associated with increases in regulatory-related costs primarily supports the evolving Nuclear Regulatory Commission (NRC) licensing process. Significant revisions to NRC rules and requirements, responses to NRC requests for additional information and the escalating NRC review fee structure account for the increased costs. Industry is already spending substantial amounts of funding above the 50/50 DOE cost-share – in spite of the fact that utilities are not yet able to make the formal decisions to proceed with construction. Without the additional DOE funding, the utilities would have to delay their schedules and construction decisions to off-set the additional costs.

The additional funding associated with increased standardization supports the industry's effort to extend the level of design detail in support of increased standardization for procurement, operation, and maintenance of the plants. This level of design detail would provide specifications of equipment and components. Without the additional funding for this degree of design detail, there is a high risk that the aggressive operational dates (~2015) for the first units of the two standard designs may not be met.

PROJECT MANAGEMENT

Chairman Visclosky. Mr. Secretary, as you know, project management and cost estimating has been one of the areas that I believe is critically important to ensuring that we spend taxpayer dollars well. Before I start my questions on these issues, I would bring to your attention a few numbers from the Government Accountability Office (GAO) report on project management at DOE:

- 33 – the percentage of time since 2002 DOE has achieved its own performance goals for line item construction projects;
- 21 – the percentage of time since 2004 DOE has met cost and schedule performance goals for "operating projects;"
- 42 – the percentage of earned value management systems for DOE projects where a review and certification has been completed;
- 18 – the number of years DOE's contract management has been designated as "high risk for fraud, waste, abuse and mismanagement.

The summary conclusion of the GAO report was that despite considerable efforts, overall performance on DOE projects has not substantially improved.

Mr. Secretary, last year you testified that progress has been made on project management at the Department, that, among other things you now have "certified" project managers and have implemented earned value management systems. Are these actions having any discernible effect on project performance?

Secretary Bodman. Project statistics reveal that, based on the past three years, the number of our line-item projects that were successfully completed, within 10 percent of the original performance baseline, was approximately 70 percent. Older GAO reports have suggested our past performance was closer to 35 percent. While this is significant improvement, it still indicates much improvement remains to consistently deliver projects at cost and on schedule.

Chairman Visclosky. DOE has been on GAO's high risk list every year since 1990. Are you still on that list today?

Secretary Bodman. Yes, the Department has been on the Government Accountability.Office High-Risk List with respect to contract and project management since the inception of this list in 1990. I expect to issue a Root Cause Analysis report focused on our systemic contract and project management deficiencies within a few weeks.

Chairman Visclosky. When do you expect DOE to progress sufficiently to be taken off the GAO watch list? What's your target date?

Secretary Bodman. I cannot predict when GAO will remove DOE from the High-Risk List, but we are aggressively developing a Corrective Action Plan that will lay out effective solutions and strategies for addressing and correcting the root causes identified in the aforementioned Root Cause Analysis report. The focus will be on properly addressing the critical few issues having the biggest impact. We expect that the solutions will focus on improving front-end planning including requirements definition and risk management, implementing a human capital strategy to ensure sufficient numbers and skills of federal project and contract management staff, and integrating project management systems to ensure better federal oversight of contractors. In implementing the Corrective Action Plan we will prioritize the actions we take based on expectation and analysis of what will have the biggest positive impact on improving project delivery.

Chairman Visclosky. Secretary Bodman, last year you testified that only 8 of 29 DOE contractors had approved earned value management (EVM) systems. In your testimony today, you state 70 percent of the Department's capital (not operating) asset projects have certified EVM. What is the status of having approved EVM systems for all DOE contractors? What is the status of having approved EVM systems for all 29 DOE contractors?

Secretary Bodman. Since last year, 9 additional contractors have certified EVM Systems for a total of 17 certified contractor EVM Systems. We are planning to certify an additional 12 EVM Systems over the next 18 months.

Chairman Visclosky. Can you tell us today, on the record, that the contractors are now submitting timely and accurate EVM reports that are consistent with the original baselines and can be relied upon to produce consistent and objective performance information?

Secretary Bodman. Contractors are providing EVMS reports to field office management in accordance with their contracts. While EVM data provided from certified contractor systems should be of good quality, we expect that there may be some areas of improvement identified when we begin performing EVM surveillance reviews starting this year.

Chairman Visclosky. Name the contractors who are submitting timely and accurate EVM reports.

Secretary Bodman: The following are the names of contractors who have certified EVM systems which submit reports:

B&W Pantex, LLC
Bechtel Jacobs Co., LLC (Oak Ridge)
Bechtel National Inc. (ORP)
Battelle Memorial Institute
BWXT Y-12, LLC
CH2M–Hill Hanford Group, Inc.
CH2M-WG Idaho, LLC (INL)
Fluor Hanford, Inc.
Los Alamos National Security, LLC
Midwest Research Institute
Raytheon Systems Company
Sandia Corporation, a Lockheed Martin Co.
University of California-LBNL
Lawrence Livermore National Security, LLC
Washington Closure Hanford, LLC
Washington Group International, Inc.
Westinghouse Savannah River Co.

Chairman Visclosky. Are there any contractors that are not submitting timely and accurate earned value reports? Who are they and what are the consequences for the contractors?

Secretary Bodman. While the contractors who do not yet have a certified EVM System do provide monthly EVMS reports, we do not attest to the same level of quality for the data reported. The following is a list of contractors who do not yet have certified EVM Systems:

Brookhaven Science Associates, LLC
Bechtel SAIC Co. LLC
Duke, Cogema Stone
Isotek Systems, LLC
Jefferson Science Associates, LLC

LATA Parallax Portsmouth, LLC
National Security Technology
Parsons Infrastructure & Technology Group, Inc.
Stoller Navarro Joint Venture
Stanford University
UT-Battelle
Washington TRU Solutions, LLC

Chairman Visclosky. Given the importance of earned value management as a project management tool, has DOE changed how it writes this requirement in its contracts, and how poor earned value reporting affects the contractor's fee?

Secretary Bodman. DOE Order 413.3A contains a Contracts Requirements Document which requires EVMS on all contracts that invoke the order and that have projects having a total cost greater than $20 million. The Federal Acquisition Regulation requires the use of FAR 52.234-4, "Earned Value Management System," in solicitations and contracts that require a contractor to use an EVMS. Under those contracts which contain an EVMS requirement, performing to the industry standard for EVMS is a basic requirement of the contract and failure to perform EVMS would be the same as failure to perform any other requirement of the contract. Under performance-based contracts, cost and schedule performance (as measured in the EVMS) will have a positive or negative affect on the ability to earn fee.

Chairman Visclosky. One of the problems with the Hanford Waste Treatment Plant was that the contractor re-set the baseline every month to make its earned value reports look good. How does the department now verify the accuracy of contractor reporting?

Secretary Bodman. We have a baseline change control process in place in which the Federal Project Director, Contracting Officer, Project Controls personnel and Financial personnel review monthly earned value and financial data to ensure integrity of the Performance Measurement Baseline is maintained, and changed only after appropriate approvals are obtained. The WTP contractor is using an Earned Value Management System that has been independently reviewed and certified as required by DOE Order 413.3A. This system is fully compliant with the American National Standards Institute 748-A-1998 standard for EVMS. In order to accommodate changes that occur during project execution, changes to the project baseline are allowed under the ANSI standard provided that the change is formally documented and reported to the government.

Chairman Visclosky. The FY 2008 Omnibus Bill directed the Department to manage all projects in excess of $100 million total costs in full compliance with DOE Management Order 413.3A. Secretary Bodman, will you testify today that the Department is in full compliance with this Order?

Secretary Bodman. Projects initiated prior to July 2006 when DOE Order 413.3A was issued may not yet be in full compliance with current provisions. One of the top issues identified in the Root Cause Analysis was that in some instances projects are initiated or carried out without fully complying with the processes and controls contained in DOE policy and guidance. Therefore,

we recognize we need to address this discrepancy in the Corrective Action Plan we are developing.

Chairman Visclosky. I am aware that there are technical reviews from outside the responsible program office, but does the Department use industry or outside government experts during the review processes for its large construction projects?

Secretary Bodman. DOE Order 413.3A requires the Office of Engineering and Construction Management to conduct external independent reviews (EIRs) of its capital asset construction projects when the expected total project cost exceeds $100 million in order to validate that the project's technical scope can be executed within the proposed cost and schedule. As its name implies, these EIRs are conducted by independent entities and experts who are external to the Department and project. In addition, some projects, such as the Waste Treatment Plant and the Salt Waste Processing Facility, have undergone independent technical reviews by experts external to the project from academia, the national labs, and private sector experts to ensure the technical basis of the process and design.

Chairman Visclosky. DOE has relied upon the fact that many of the facilities it is charged with constructing are "one-off" or unique facilities to excuse its inability to accurately estimate costs and schedules. One of GAO recommendations to partially address the challenge of cost estimates on these facilities was to implement a technology readiness assessment for large construction projects. Last year you testified that the Office of Environmental Management had implemented this recommendation for the Waste Treatment Plant. At that time you also testified that the Department would pilot the application of this assessment on other selected projects and thereafter, conduct the technology readiness assessments on other projects where it makes good business sense. Has the Department followed through on this commitment?

Secretary Bodman. One of the issues identified in the Root Cause Analysis on contract and project management deficiencies is that DOE has not always ensured that critical technologies in final project designs have been demonstrated to work as intended. We recognize we need to do more to address this shortcoming in the Corrective Action Plan under development. In the short-term, OECM is planning to include a section on Technology Readiness Assessments (TRA) in the Project Review Guide, one of the eighteen guides being developed to supplement DOE Order 413.3A. This Guide is expected to be issued by the end of September 2008. In addition, EM is developing a TRA Guide describing the process to follow in organizing and conducting a TRA, and developing a Technology Maturation Plan to identify the additional testing required to mature the critical technology element under evaluation to a Technology Readiness Level (TRL) of 6. The EM TRA Guide is scheduled to be issued to the field by the end of March 2008. The procedures in these guides will be used while performing our EIR's and will be used as part of a projects CD-2 approval process.

Chairman Visclosky. Name the projects where DOE has conducted this assessment. Are there any projects where DOE has decided this assessment is not necessary?

Secretary Bodman. In response to the GAO recommendation (March 2007) for assessment of DOE projects, and the recommendation provided in the 2008 House Appropriations Report,

DOE has piloted the Technology Readiness Assessment (TRA) Process on several EM projects. The first project for which DOE conducted a TRA was the Hanford Waste Treatment and Immobilization Plant (WTP). This TRA was initiated in November 2006, and completed in March 2007. In summary, DOE has conducted a total of 8 pilot TRAs, which are listed below:

Hanford WTP Laboratory
Hanford WTP Low Activity Waste (LAW) Facility
Hanford WTP Balance of Facilities
Hanford WTP High-Level Waste (HLW) Facility
Hanford WTP Pre-Treatment (PT) Facility
Hanford Study of LAW Treatment Alternatives
Hanford K Basins Sludge Treatment
Savannah River Tank 48H Waste Treatment Technologies

The Office of Nuclear Energy is also applying the TRA process to the Global Nuclear Energy Partnership suite of projects. While they have assigned TRLs at a fairly high level consistent with their state of planning, they will continue to perform TRAs on the facilities and processes as they are further refined, and develop technology maturation plans for the discrete critical technologies identified.

Chairman Visclosky. The President's management agenda scorecard lists DOE as red for competitive sourcing and financial performance. This score indicates the "initiative in serious jeopardy absent significant management intervention." Based on the information I have at my disposal, I happen to agree with the Administration's assessment of their performance, particularly on the financial performance. What actions are you taking to remedy this situation?

Secretary Bodman. The President's Management Agenda score for financial performance is currently rated as green in "status" and green in "progress." The "status" score was upgraded from red to green during the first quarter of FY 2008 as a result of achieving an unqualified (clean) opinion on the Department's FY 2007 consolidated financial statements.

The DOE competitive sourcing PMA scorecard is red because the Department has not conducted competitions on 100-300 FTEs per year as we committed to the Office of Management and Budget. The FY 2007 and FY 2008 DOE Competitive Sourcing Program was impacted by H.R. 2206, P. L. 110-28, that states that "Hereafter, federal employees at the National Energy Technology Laboratory shall be classified as inherently governmental for the purpose of the Federal Activities Inventory Act of 1998 (31 U.S.C. 501.note)." Since the Federal Acquisition Regulation and OMB A-76 Circular precludes inherently governmental positions being subject to an A-76 competition, DOE cancelled one ongoing competition for 72 National Energy Technology Laboratory (NETL) FTEs in FY 2007 and did not initiate a potential competition of 450 NETL FTEs in FY 2008.

Chairman Visclosky. Do you have a target date for completing corrective actions?

Secretary Bodman. Corrective actions for financial performance were completed during FY 2007. The Department had been rated red in "status" for financial performance since the first

quarter of FY 2006 when we received a disclaimer of opinion on our FY 2005 consolidated financial statements. As a result of the corrective actions taken during FY 2006 and FY 2007, we regained our unqualified (clean) opinion in just two fiscal years, the shortest time possible under auditing standards.

The Department continues to evaluate the performance of the completed Competitive Sourcing competitions and has recently requested all DOE Heads of Departmental Elements to identify any appropriate A-76 Study candidates (functions or organizations) for the annual Feasibility Reviews. A Feasibility Review (FR) is a review conducted by a team of subject matter experts to determine if there is a sufficient business case to conduct a public-private competition, or some other management improvement effort, to achieve meaningful efficiencies and cost savings. Any candidates identified for a FR that are later selected for competition would constitute DOE's 100-300 FTEs per year commitment to OMB.

Chairman Visclosky. Accurate, complete, and timely cost and schedule data are crucial for the effective management of DOE's projects. In the past, GAO and others have criticized the Department's Project Assessment and Reporting System (PARS) as unreliable. PARS has been criticized because it looks at project performance at the highest or total project level, and therefore problems at lower levels of the project (i.e., with sub-systems or sub-tasks one or more levels down) may not be apparent in PARS until long after the damage has been done to the project's cost and schedule performance. In your view, is this a valid concern and, if so, what steps has DOE taken to resolve this issue?

Secretary Bodman. This is a valid concern. The current PARS solution captures project performance metrics only at the total project level, i.e., at the top level of the work breakdown structure (WBS). DOE's requirements for a solution to replace PARS include the ability to capture project performance metrics at lower levels of the work breakdown structure. DOE is currently evaluating candidate solutions and expects to stand up a prototype of the new PARS solution this year.

Chairman Visclosky. Is DOE examining options to provide senior managers with more timely project performance data by, for example, electronically linking contractors' project management systems to PARS?

Secretary Bodman. Yes. As part of the PARS replacement effort discussed above, DOE's technical requirements include the ability to interface directly with the contractors' project management systems.

Chairman Visclosky. Many reports have indicated that a forthcoming wave of retirements could significantly reduce the number of federal contracting and project personnel with the appropriate skills (e.g., cost estimating, scheduling, risk management, and technical expertise) to plan, direct, and oversee project execution. In particular, DOE's efforts to merge project management and acquisitions functions are being hamstrung by staffing shortfalls in DOE's Office of Engineering and Construction Management (OECM) and across Office of Environmental Management Sites. How does DOE plan to address its human capital shortfall and its potential effect on effective project management?

Secretary Bodman. The OECM recently completed a staffing study which identified the need for better trained/skilled resources. Within available resources, OECM plans to increase its staffing level by 3 FTEs in FY 2008, and has requested authority to increase its staffing levels by an additional 5 FTEs in the FY 2009 budget submission. EM has also recently completed a human capital analysis called the Best In Class Project Management Initiative which identified the need for about 160 additional contract and project management FTEs across its complex of sites. EM is currently augmenting its field staff with contracted resources to partially fill this gap while it undertakes efforts to acquire, re-train and fill the gap with federal employees.

As noted in the contract and project management Root Cause Analysis, one of the two top issues identified was that DOE does not have an adequate number of trained federal contracting and project personnel with the appropriate skills (e.g., cost estimating, scheduling, risk management, and technical expertise) to plan, direct, and oversee project execution. As part of the Corrective Action Plan, we will undertake a Human Capital Study across the entire DOE complex to identify resource requirements and develop a plan to acquire, train and reassign necessary contract and project management personnel.

Chairman Visclosky. Please provide for the record a response to the following questions. OECM establishes, maintains, and executes a corporate independent review capability to provide an independent assessment and analysis of project planning, execution, and performance. OECM validates the performance baseline for projects with total project costs greater than or equal to $100 million to permit inclusion in the DOE annual budget. OECM is also responsible for certifying selected DOE contractors' implementation of earned-value management systems—an intensive method for tracking project performance used in the private sector and throughout the federal government. The performance information obtained from these systems is fed into PARS and used by the department to oversee ongoing projects. What assurances can you provide this Subcommittee that the external independent review process will provide credible validation/certification of scope, cost and schedule baseline estimates, given the fact that within only a few months after OECM has validated major operating projects, significant baseline changes have occurred on many projects?

Secretary Bodman. Relative to our line-item capital asset construction projects, OECM generally 'hits the mark;' baselines are stable over a prolonged period of time. There is only one instance where that was not the case, our DUF6 Project. I believe that to be an isolated case and was more a function of poor contractor performance.

The OECM certifies EM operating project performance baselines based on many factors, to include sufficient design maturity and stable requirements definition, appropriate manpower, with the right skill-set mix and a proposed out-year funding profile that is realistic and supports the cost baseline. Since EM clean-up projects are funded using program dollars, not capital asset dollars, these operating projects are more susceptible to funding turbulence across the program. When unexpected programmatic costs arise during a fiscal year, given a finite 'top line', often dollars are reallocated from operating projects. When this occurs, this reallocation often precipitates the need to rebaseline. This rebaselining is not a reflection of OECM's external

review, but more a reflection of an adjusted funding profile. Generally, I believe our EIR process is sound.

Chairman Visclosky. Although certification of earned value management systems is essential for ensuring that the contractors have the proper procedures in place, certification alone does not guarantee that the procedures will be carried out as promised. What is the status of OECM's efforts to develop a monitoring program to help ensure that earned value management systems are used properly?

Secretary Bodman. Certification of a contractor's EVM System helps ensure that the earned value management data is reliable. To help ensure that the contractor's policies continue to be implemented, the Department's EVMS certification process, in compliance with the industry EVMS standard ANSI/EIA-748, includes the review and implementation of the contractor's surveillance process. Our federal line management also assesses the quality of the monthly project performance reports and results of the contractor surveillance to determine if additional federal surveillances are necessary. In addition, as part of its oversight role, OECM will start conducting periodic surveillance reviews this fiscal year as part of the Department's continuous efforts to institutionalize EVMS across the Department. In that effort, the outlined surveillance process will be published in the Department's EVMS Guide that will be released in the immediate future.

OFFICE OF ENVIRONMENTAL MANAGEMENT PROJECT MANAGEMENT

Chairman Visclosky. DOE major operating projects have experienced significant cost increases and schedule delays over the past several years. Because DOE has underestimated the true cost of these projects and defers significant amounts of work scope, DOE continues to breach commitments to Congress and regulators regarding the amount of work scope it will accomplish within a given schedule. What strategy do you envision, for future management of the Office of Environmental Management's portfolio of major operating projects, for correcting past cost and schedule estimating problems?

Secretary Bodman. The Office of Environmental Management (EM) has, in the past, relied heavily on the contractors managing our sites to develop the cost and schedule estimates for accomplishing cleanup work. We have often accepted their estimates with limited review. We now realize they were generally optimistic and based on assumptions that did not materialize. We now have had each of our cost and schedule baselines reviewed by expert teams external to the projects and independent of EM, which subsequently certified that the estimates are reasonable and achievable. We continuously monitor the projects' performance against these baselines and implement corrective actions when necessary to keep them on track.

We are certifying all our federal Project Directors to the rigorous industry standards for Project Manager. We are also developing an in-house capability with federal staff at the Consolidated Business Center in Cincinnati to perform our own cost estimates to support procurements and to evaluate the estimates of ongoing projects. In this way, EM can affirm the basis of estimates and account for risks that are inherent to cleanup work.

Chairman Visclosky. Given the Office of Environmental Management's past inability to prepare credible project cost and schedule estimates, how do you plan to minimize future risk of regulatory non-compliance that could result in fines and to reduce any inefficiency that might result from work scope deferral?

Secretary Bodman. Many of the regulatory agreements and consent orders that contain performance milestones for the EM program were negotiated or imposed at a time when EM was still characterizing the problems to be solved and developing technical solutions. Milestones were established based on this early information and, in some cases, with little actual field testing of cleanup technologies that strategies would mature in sufficient time to satisfy regulatory requirements.

The EM program has made considerable progress with better characterization data, better understanding of the best technical approach to solve problems, certified federal Project Directors heading each project, cost and schedule baselines that are realistic, and analytical tools to aid in evaluating trade offs. In this posture, we are in a better position to discuss the current suite of milestones with our regulators and commit to an achievable risk-based path forward.

CONTRACTING AND PAYMENTS

Chairman Visclosky. Please provide for the record a list of all DOE and national laboratory contractors contracts with or grants to firms or individuals for public relations purposes, including the firm or individual, the dollar amount and the purpose of the contract or grant for the period of FY 2007 and the first quarter of FY 2008.

Secretary Bodman. Enclosed are the documents identifying the contract awards executed by DOE in FY 2007 or during the first quarter of FY 2008 for public relations services. The data was generated by a data request made of DOE's automated Procurement and Assistance Data System (PADS). The documents identify awards that were coded using the North American Industrial Classification System code (NAICS) 541820 or Product/Service Code R708. Both of these codes relate to awards for Public Relations Services.

The total value of these awards is $1.6 million. The total obligations in FY 2007 under these contracts were $113.2 thousand; the total obligations during the first quarter of FY 2008 were $149.2 thousand. The documents provide, for each contract, the report provides the award number, the name of the awardee, the program or office initiating the award, the description of work, the award value, obligations and other information. We did not find any financial assistance awards for public relations services. The search used a key word search.

The Department does not have an information management system that collects and maintains the requested information on national laboratory subcontracts. This information will be requested, compiled and provided as soon as possible.

Chairman Visclosky. Please provide for the record a list of all non-competitive contracts or cooperative agreements issued by each program or laboratory, including the type of sole-source

contract (8A, Small Business set aside, etc.), type of contract (fixed price, etc.), firm or individual, the dollar amount and the purpose of the contract or cooperative agreement.

Secretary Bodman. Enclosed are two sets of documents identifying the non-competitive awards made by DOE in FY 2007 and the first quarter of FY 2008. The data was generated by a data request made of DOE's automated Procurement and Assistance Data System (PADS).

The first set (Enclosure Q22-1) includes data regarding the non-competitive contracts awarded by DOE over $100,000. Non-competitive is defined as not competed or not available for competition. The Enclosure Q22-1 data includes for each award, the name of the awardee, place of performance, the award value, obligations, description of work, the type of award, and other information. The report also provides the program or office that initiated the award and the type of set-aside, where applicable. There are 262 awards identified in Enclosure Q22-1, with a total award value of $1.5 billion. The obligations in FY 2007 were $372.6 million; the obligations in the first quarter of FY 2008 were $341.9 million.

The second set (Enclosure Q22-2) includes data regarding the non-competitive cooperative agreements executed by DOE during FY 2007 and the first quarter of FY 2008. This listing also provides the award number, the name of the awardee, place of performance, the award value, obligations, description of work, the type of award, the name of the program office that initiated the award and other information. There are 30 awards identified in Enclosure Q22-2, with a total award value of $433.6 million. The obligations under the identified agreements in FY 2007 were $42.4 million; the obligations in the first quarter of FY 2008 were $38 million.

The Department does not have an information management system that collects and maintains such data for national laboratory subcontracts. National laboratory contractors do not award cooperative agreements. The data on non-competitive subcontracts will be requested, compiled and provided as soon as possible.

Chairman Visclosky. Secretary Bodman, as you know, last year I expressed concern that DOE contractors can attribute to the government the cost of whistle blower settlements prior to trial. While I know this is authorized by the Energy Policy Act of 2005, it seems to make the government responsible for the misdeeds of its contractors. As much as the funding issue concerns me, there is a larger issue at stake – there is little or no accountability for contractor actions in situations which result in a voluntary settlement or court awarded damages. If DOE will not force transparency on contractor performance issues, this Committee will. Please provide for the record a list of all reimbursements for FY 2006 through 2008, to contractors for all costs associated with voluntary settlements or court awarded damages, including litigation costs where the contractor settles with the plaintiffs (e.g. whistleblower) before a final ruling by a court or administrative judge. This list should include detailed information for each reimbursement by contractor and incidence.

Secretary Bodman. See attached charts which detail the costs, including litigation costs, approved for reimbursement for voluntary settlements or court awarded damages. This information is from the Department's Legal Management Tracking System. Contractor litigation

costs are entered by the field counsel's offices after the costs have been reviewed and approved by DOE.

The Department's position on reimbursement of contractor litigation and legal costs follows government-wide practice under cost-type contracts. The Department uses cost reimbursement contracts for its major site and facility management contracts because the uncertainties involved in contract performance do not permit costs to be estimated with sufficient accuracy to use any type of fixed-price contract. Cost reimbursement contracts provide for payment to the contractor of those costs incurred to perform the contract work that are reasonable, allocable, and not otherwise unallowable.

For its site and facility management contracts, the Department uses a specially-crafted contract clause to detail the procedural and cost allowability requirements that apply to litigation initiated by the contractor or against the contractor arising out of performance of the contract work. The DOE clause, entitled "Insurance – Litigation and Claims," provides for the general allowability of contractor liabilities to third parties (including reasonable expenses incident to such liabilities), but provides that these costs will not be reimbursed by the Department if such liabilities result from willful misconduct, lack of good faith, or failure to exercise prudent business judgment by the contractor's managerial personnel.

Since in cost-type contracts the government will likely be liable for the costs of judgments against contractors, it generally makes sense for the government to reimburse contractors for the reasonable costs of defending themselves in legal proceedings where the government will likely have to reimburse the contractor for any ultimate judgment. Consequently, in cost-type contracts, legal services costs incurred by a contactor that are reasonable and allocable to the contract are allowable contract costs.

DOE's efforts to monitor and track contractor litigation go back over a decade. The first litigation management procedures were issued by General Counsel Nordhaus in March 1994, and a tracking system was developed soon thereafter. The procedures were applicable to virtually all cases where DOE might be contractually responsible for contractor litigation costs. They imposed substantive requirements on DOE field counsel, contractor counsel, and outside counsel to ensure that the public funds were not spent imprudently. Non-compliance would result in disallowance of costs. Since 1994 there have been procedures in place which have been revised over the years. The most recent version of the procedures, which became effective in April 2001, are found at 10 CFR Part 719.

The Legal Management Tracking System is an electronic database system into which the field counsel enter cost information regarding cases and issues. The data is entered after the costs have been reviewed and approved for reimbursement.

Chairman Visclosky. On February 13, 2007, a jury awarded Sandia whistleblower Shawn Carpenter over $4.6 million in the case of Carpenter v. Sandia Corporation. On September 26, 2007, a settlement agreement was executed by the parties. Did DOE reimburse Sandia Corporation for the amount paid to Mr. Carpenter pursuant to the settlement agreement?

Secretary Bodman. The jury awarded Mr. Carpenter $4.3 million in punitive damages and over $400,000 in compensatory damages and costs. In September 2007, Sandia Corporation and Mr. Carpenter entered into a confidential settlement agreement. NNSA's Office of the General Counsel determined in October 2007 that the amount of the settlement attributable to the award of punitive damages (about 91 percent of the settlement amount) was not an allowable cost under Sandia's contract and informed the Sandia Site Office's Contracting Officer of this determination. The Office of the General Counsel is analyzing whether any of the remaining settlement costs, and Sandia's attorneys fees, are allowable under the contract. It expects to make a determination soon.

CONTRACTOR PERFORMANCE

Chairman Visclosky. The Office of Science recently released a "report card" on the performance of its ten laboratories. It is useful to have this information publicly available, and to be able to compare contractor performance with contractor fees earned. This enables everyone, both in Congress and the public, to understand how DOE contractors are performing and how that performance relates to their compensation. Why doesn't DOE issue a similar "report card" on the performance of all of its laboratories and its major contractors?

Secretary Bodman. The Office of Science's "report card" is a useful management tool, developed within the specific structure of the Office of Science to meet the specific needs of officials responsible for managing the national laboratories carrying out the unique missions of DOE's science laboratories. Significant resources and effort are devoted the analysis that forms the basis for the report cards.

Other department program offices managing non-science facilities and missions have widely diverse structures and missions than that of the Office of Science. The evaluation of contractor performance is a consideration in every department contract, based on the requirement, the acquisition strategy, the contract type, competition level and many other logistical and technical considerations, using all available tools provided within federal and department acquisition regulations. However, the Department will review the "report card" model for its potential use in meeting other program requirements.

Chairman Visclosky. The current contractor team for the Depleted Uranium Hexafluoride (DUF6) projects at Portsmouth and Paducah, Uranium Disposition Services LLC (comprised of Burns and Roe, Framatome, and Duratek), is apparently missing their cost and schedule targets in a big way. UDS has missed its performance milestones and a "cure notice" was issued by DOE last fall. What changes is DOE considering to make this contract work, and what will be the consequences to the current contractor in terms of reduced award fees?

Secretary Bodman. The Department is pursuing its contractual options under the Show Cause/Cure Notice that was issued on November 30, 2007. The Department is currently engaging with UDS on these issues. Each of the three phases of the contract has an independent fee arrangement. Fees include the design (fixed fee, $2 million), construction (incentive fee, $18 miilion), and operations and cylinder management (award fee, $43 million) phases of the contract.

The fixed fee portion of the contract is for the design phase, and the fee has been paid, therefore it cannot be negotiated. The construction phase of the contract includes an incentive fee arrangement that provides specific consequences for cost and schedule performance. Due to the poor performance, UDS's fee expectation is estimated to be less than $4 million out of the available $18-million incentive fee pool. The operations and cylinder management fee is separated into five areas including award fee for operations and cylinder management ($8.7 million), cost-per-kilogram incentive fee for DUF6 processed ($21.7 million), number of kilograms incentive fee for DUF6 processed ($8.7 million), award fee for number of ETTP cylinders shipped ($2.2 million), and award fee for fluorine product sales ($2.2 million). An award amount of $203,227 has been paid in operations and cylinder management for cylinder yard surveillance and maintenance, which commenced in June 2005.

Chairman Visclosky. The Department of Commerce maintains a list of "non-performing contractors" that agencies are supposed to review before making new contract awards. Will the Department submit the UDS partnership, or the individual members of that partnership, as non-performing contractors? If not, please explain why not.

Secretary Bodman. It appears that you are referring to the "Excluded Parties List System" that is maintained by the General Services Administration. This list is for companies and individuals that have been debarred or suspended for cause and cannot receive government contracts. At this time, UDS's performance under the contract is not a cause for suspension or debarment under government-wide rules. However, there is a government-wide past performance database maintained by NIH that agencies can use to record contractors' performance at the conclusion of a contract. The Department uses the National Institutes of Health Contractor Performance System (NIH CPS) as its automated contractor performance information database. In addition, the Department uses the Past Performance Information Retrieval System (PPIRS) which is maintained by the Department of Defense, as a government-wide contractor past performance repository. Following the completion and closeout of contracts such as the DUF6 Contract held by UDS, performance information and supporting data is entered into NIH CPS, which is then fed into PPIRS. This information is captured and maintained for universal access by other Federal Acquisition Officials as needed in accordance with restrictions outlined in the Federal Acquisition Regulations.

Information concerning the performance of UDS has been provided for use in evaluations of other contracts through past performance surveys. This information has been provided when evaluating the parent companies that created UDS in their pursuit of new work, if they are solely proposing work or are part of another LLC or partnership. Final determination of the UDS performance will not be made until the contract is complete; at that time appropriate past performance information associated with UDS will be reported to NIH CPS.

Chairman Visclosky. Please list for the record who the non-performing contractors are.

Secretary Bodman. The Department does not maintain the list of Excluded Parties; that is maintained by U.S. General Service Administration and is accessible by authorized contracting officials government-wide. The list can change frequently as information is provided. We are

unaware of any separate list of "non-performing contractors" maintained by the Department of Commerce, and there is no such list for DOE.

Chairman Visclosky. How does DOE use its knowledge of contractor performance across different programs? For example, one of the key competitors for the Los Alamos and Livermore contracts had substandard performance on other contracts at Hanford and in Nevada, but it is not clear that the NNSA selection officials considered this performance when making their award decisions. Similarly, while the Office of Environmental Management will be very aware of the problems with the team members on the DUF6 conversion contract, it is not clear that other DOE programs will be clued in. How and where in the Department does this knowledge on contractor performance come together to make better-informed contract award decisions in the future?

Secretary Bodman. The Department collects, reports, and maintains information on contractor performance during and at the end of the performance periods and routinely uses this information, as well as past performance information available from other sources, in making contract award decisions. The Department uses the National Institutes of Health Contractor Performance System (NIH CPS) as its automated contractor performance information database. In addition, the Department uses the Past Performance Information Retrieval System (PPIRS) which is maintained by the Department of Defense, as a Government-wide contractor past performance repository. This information is universally accessible by other Federal Acquisition Officials as needed in accordance with restrictions outlined in the Federal Acquisition Regulation. Federal agencies, including DOE, may supplement this information by using written survey questionnaires and by conducting interviews of relevant government or commercial references to obtain additional information regarding a prospective contractor's past performance. In addition, the evaluation teams consist of personnel from various programs with knowledge on contractor performance.

DARPA BIOFUELS SOLICITATION: COORDINATION WITH DOE?

Chairman Visclosky. Mr. Secretary, the Defense Advanced Research Projects Agency (DARPA) posted a broad agency announcement last November for the production of biofuels from cellulosic and algal feedstocks. This is intended to find a surrogate for petroleum based military jet fuel (JP-8). As I understand it, current commercial processes for producing biodiesel yield a fuel that is unsuitable for military applications, which require higher energy density and a wide operating temperature range. Is the DOE aware of this research sponsored by DARPA, and are you coordinating with them on it?

Secretary Bodman. DOE is aware of DARPA's broad agency announcement, BAA08-07, to develop alternatives to petroleum derived JP8 from agricultural and aqua-cultural feedstock materials. A federal multiagency conference call was held on February 7, 2008, coordinated by the Office of Biomass Programs within DOE's Office of Energy Efficiency and Renewable Energy to better understand the ongoing efforts related to algae for fuels within the federal government. While DARPA was not in attendance at this meeting, DOD was represented and their interests captured for further discussion in follow up meetings.

Chairman Visclosky. Is there a possible duplication of effort of this DARPA biofuels research and the work on cellulosic biomass by the Office of Science and the Energy Efficiency and Renewable Energy program?

Secretary Bodman. DARPA clearly identifies JP8 fuels derived from cellulosic or algal derived feedstocks as their key objectives, with a principal goal of demonstrating scalable and commercially viable processes at affordable costs (less than $3 per gallon). In contrast, DOE is currently evaluating the state of technology and barriers associated with using algae to produce alternative fuels that meet ASTM standards and can replace gasoline and diesel in vehicles. The standards needed for JP8 fuels differ in several significant ways including energy density. Because of the potential of algae to provide large volumes of oils that can be used in producing transportation fuels, DOE released an SBIR topic soliciting proposals in the area of microalgal production of diesel fuel substitutes. The specific areas of interest include a.) system design of photobioreactor/pond systems, b.) selection and design of the microalgal species, c.) oil recovery and purification, d.) and fuel production. The first three areas of interest (a-c) would be of interest to both DARPA and DOE. Duplicative funding should be avoided and information should be shared between the two agencies for these areas in particular.

DOE AND NNSA CYBER SECURITY

Chairman Visclosky. Please provide for the record a response to the following questions. As a result of the importance of information technology to its numerous projects, laboratories, and assets, cyber security has become a crucial aspect of the Department's overall security posture. Over the past few years, a number of weaknesses in DOE's cyber security programs have been identified by internal and external assessments. In February 2006, DOE's Chief Information Officer issued a Revitalization Plan to address weaknesses in the Department's cyber security posture and to mitigate the more immediate issues identified by independent assessments. In addition, the Revitalization Plan identified a roadmap to be completed within a 12-month period.

What is the status of implementing the Cyber Security Revitalization Plan across the DOE complex? Which sites have fully implemented the milestones outlined in this plan? Of the sites that have not fully implemented the Revitalization Plan, how long will it be before the plan is fully implemented? Please provide the completion date and cost by site. How much has been spent to implement this plan? What other actions have been taken to improve DOE's cyber security posture? How much longer will it take for DOE to institute a successful cyber security program?

Secretary Bodman. I am pleased to report that the Department of Energy has made substantial progress to revitalize cyber security since February 2006. The Revitalization Plan defined a roadmap that has guided these improvement efforts. First and foremost, the governance and policy framework was established. DOE Order 205.1A, published in December 2006, established the Department's cyber security program, in which senior executives at the Under Secretary level share responsibility and accountability for cyber security. These executives, through their implementation of Departmental guidance, requirements, and policies into tailored Program Cyber Security Plans, provide cyber security policy to support the diverse missions of the Department. Twenty-one guidance documents were published during 2006 and

2007. The DOE Manual 205.1-4, the National Security System Manual, was published on March 8, 2007, to govern security of classified systems. Nineteen Technical and Management Requirements documents were issued in 2007 to further define Departmental policy requirements. Requirements of DOE Order 205.1A and DOE Manual 205.1-4 have been included in all Departmental contracts where appropriate, including DOE sites.

The Chief Information Security Officer (CISO) published a Cyber Security Strategic Plan and an IT Security Architecture in February 2007. A threat overview has been developed. Threat sharing meetings occur weekly among Departmental elements to exchange information and direct necessary activities to provide the defense-in-depth necessary to protect the Department against attack. An Executive Steering Committee chaired by the Chief Information Officer (CIO) provides the formal mechanism for Under Secretaries, the NNSA Administrator, and other executives to share responsibility and accountability for cyber security direction.

The CISO hosts weekly Cyber Security Working Group meetings to ensure all subordinate organizations within the Department are aware of ongoing cyber activities and are afforded the opportunity to provide input. The CIO and CISO hosted an annual cyber security conference in May 2007 to ensure that technical, management, and administrative staff throughout the complex with cyber security roles are educated and trained to execute their responsibilities. Training and awareness is an ongoing activity. In 2008, the CISO is sponsoring program-specific workshops across the country to enable each mission area to tailor training programs to address their particular needs. The first one was conducted March 3-7 in Germantown for our Headquarters element, where several training courses were piloted with great success.

The CISO has provided some enterprise licenses for cyber security products that are in use across the Department, and work continues to identify and bring additional products under enterprise licensing, where practical, to provide cost-effective and useful cyber security tools that protect the enterprise. Work is ongoing and partnerships with other agencies have been established to identify additional potential tools to incorporate into the DOE environment to counter emerging threats. An asset management tool has been prototyped and deployed. An advice and assistance program has been established that provides technical and management assistance to the sites upon request or as needed. Compliance reviews on Departmental cyber security policy implementation has begun.

It is important to note that the Revitalization Plan represented the activities necessary to implement a complete, robust, overarching Cyber Security Program for the Department of Energy. It was designed to be an enterprise program plan and was not intended to be implemented at the site level. Because of this, the Office of Cyber Security tracks completion of Revitalization Plan milestones at the Department level, and not at the site level. Sites do not report on the Revitalization Plan, as it does not pertain to them directly. Sites do report cyber security metrics on a quarterly and annual basis, which are included with the Department's Federal Information Security Management Act (FISMA) reports.

In FY 2007, the Department-wide cyber security expenditures were approximately $295 million, with the CIO cyber security budget of $43 million including $18 million specifically provided by Congress through the Continuing Resolution. Those funds contributed to the success of the

many activities listed above, enhancing the cyber posture of the department including implementing the cyber revitalization plan. The $35 million in cyber security funding received in FY 2008 by the CIO as a part of the $250 million estimated department-wide cyber security budget will enable the continuation of these projects and completion of efforts to further enhance enterprise incident reporting and management, and sustain ongoing efforts to further identify and field enterprise solutions for performing certification and accreditation, automated FISMA reporting, and assessing the maturity and effectiveness of the cyber security program.

Additionally, considerable effort was expended on projects that were not part of the Revitalization Plan of 2006 but emerged as new risks and vulnerabilities were identified that needed to be addressed. The Department devoted significant resources and effort to comply with federal direction to protect Personally Identifiable Information (PII) and sensitive information that leaves the physical control of federal agencies. This includes the encryption of laptops and mobile devices that contain sensitive information, and the encryption of sensitive information while it is in transit. Technical solutions have been deployed throughout the Department, along with training and awareness campaigns to assist users in protecting this data and equipment.

In response to persistent cyber attacks launched against the Department over the past few years, the CIO stepped up incident management reporting and operations to ensure that attacks identified internally as well as through intelligence gained from other Departments and Agencies could be detected and action taken to mitigate the impact of such attacks. Expansion of the Department's state-of-the-art Cooperative Protection Program is underway to deploy sensors currently located at key facilities across all sites for early detection of these attacks and rapid correlation of cyber security events.

The Deputy Secretary convened a Cyber Security Summit in late September 2007, well in advance of recent national initiatives announced in January of this year, to identify threats to our critical mission data and sensitive information and define a strategy to better protect this information. Senior executives, including the Under Secretaries, Laboratory Directors, and staff executives who lead intelligence, legal, safety, cyber, and law enforcement efforts in the Department, actively participated to better understand the nature of the new threats and committed their support to ongoing activities to better identify and protect the Department's "crown jewels."

As new threats, vulnerabilities, and risks emerge, priorities are adjusted and new program activities are added to the cyber security efforts of the Department. Cyber security is an ongoing, never-ending activity that requires continuous modification and fine-tuning in order to respond to the threats that pose the most significant risk to the Department. Each year, adjustments will be made to continue to adapt the program to counter the emergent threat landscape in a way that still allows the vital business of this Department to continue, using existing funding. For instance, work is underway to further refine the threat statement and conduct a Department-wide risk assessment, which will guide decisions to prioritize ongoing projects and help identify new activities that should be added to the program. This ever-changing threat picture, coupled with rapid developments in technology, evolving national efforts such as the Trusted Internet Connection project, and other important initiatives, require flexibility to sustain incremental cyber security improvements and incorporate unplanned projects quickly and effectively.

I believe that our efforts to revitalize cyber security in DOE have been successful, and that we have indeed initiated a successful cyber security program, due in part to the dedication and commitment of the leadership of all programs within the Department to protect our critical and sensitive data, along with the diligence and passion of the cyber security professionals at all levels who ensure effective implementation and operation of cyber security policies, programs, procedures, controls, and countermeasures. The Department's annual Federal Information Security Management Act report submitted in October 2007 acknowledged our improvements and the Office of the Inspector General raised its rating of our certification and accreditation processes to "satisfactory." I am proud of our efforts that have appreciably revitalized cyber security at the Department of Energy, and I remain committed to the ongoing work that will continue to yield improvements in this critical area.

DOE INNOVATIVE TECHNOLOGIES LOAN GUARANTEE PROGRAM

PROJECT/ TECHNOLOGY SELECTION

Chairman Visclosky. What effort is DOE taking to select projects for loan guarantees that best further the nation's energy goals while also mitigating risk to the taxpayer?

Secretary Bodman. The Department of Energy is placing a high priority on selecting technologies that have the potential for the greatest reduction in greenhouse gases and air pollutants and which provide long-term environmental benefits. Consideration is being given to those technologies which provide the ability to be viable over a long-term both with respect to innovation and uniqueness of the applied processes as well as their contribution for economies of scale for output. Consideration is also being given to the ability of the technology to be deployed over a broad cross section of the markets it serves both with respect to geographic and economic diversity. The Department is placing particular emphasis on innovative technologies that are in the near-term ready to move from the demonstration stage to the commercialization stage through a sustainable scale-up for markets that are mature enough to absorb the output product both with respect to quality and deliverability. An additional important consideration is the determination that there is a reasonable prospect of repayment of the principal and interest on the obligation by the borrower, and that the amount of the obligation (when combined with other amounts available to the borrower from other sources) will be sufficient to carry out the project.

Chairman Visclosky. Given that Title XVII requires that technologies must either reduce air pollutants or greenhouse gas emissions, how will DOE determine which takes precedence if a technology decreases one but increases the other?

Secretary Bodman. The Department will look at a project from a holistic standpoint and will evaluate the environmental merits of each application. We recognize that there are technologies that provide significant benefits in the reduction of air pollutants but do not reduce or avoid greenhouse gas emissions. Technologies such as these will be carefully reviewed for other incidental benefits to the nation such as reducing our dependence on foreign oil and increasing our energy security. In addition, each project will be judged on its financial merits critical to ensuring that the financial risk to taxpayers is minimized. Only after a full due diligence of

environmental and financial benefits have been conducted can the Department determine the benefits of a project as a whole.

Chairman Visclosky. The Loan Guarantee Program's stated goals are to reduce greenhouse gas emissions or air pollutants and to achieve significant environmental benefits. To what extent has DOE provided guidance to applicants about what it expects them to provide or demonstrate in their applications, and about how DOE will measure the adequacy of these estimated reductions or benefits?

Secretary Bodman. In the Final Rule for the Loan Guarantee Program issued last October, the regulations state that as part of an application, an applicant must submit "a report containing an analysis of the potential environmental impacts of the project that will enable the Department to assess whether the project will comply with all applicable environmental requirements, and that will enable the Department to undertake and complete any necessary reviews under the National Environmental Policy Act of 1969." The information provided will enable the Loan Guarantee Program Office to measure each project's potential for reducing greenhouse gas emissions and air pollutants and achieving other environmental benefits.

PACE OF PROGRAM IMPLEMENTATION

Chairman Visclosky. Given that the agency does not have recent experience running a loan program and its past track record has been poor with 10 of 16 loans defaulting, how are you being prudent so that the new loan guarantee program will mitigate financial risks to taxpayers? If not, please explain.

Secretary Bodman. Mitigating financial risk to taxpayers is of utmost importance to the Department in implementing the Title XVII Incentives for Innovative Technologies Loan Guarantee Program. A number of measures are being taken to ensure risks are properly mitigated for each project prior to approval for closing of a loan guarantee. First, the Loan Guarantee Program Office (LGPO) is comprised of professional project financiers with both government and private-sector experience who will underwrite and perform the due diligence on all projects. This process includes a thorough investigation and analysis of each project's financial, technical and legal strengths and weaknesses. In addition to the underwriting expertise of the LGPO staff, each project will be reviewed in consultation with independent engineering consultants. Finally, as well as being required to take a significant equity stake in a project, each project sponsor will also be required to pay a credit subsidy cost equal to the expected cost to government of providing the loan guarantee.

Chairman Visclosky. Given that the Loan Guarantee Program office expects that it will take 30 months to negotiate some of the loan guarantees, to what extent and how can you ensure that the technologies are still new and innovative upon issuance of the guarantee?

Secretary Bodman. Each loan guarantee application will be considered on its own unique merits, and the timeframe to negotiate a loan guarantee will vary based on the technology and complexity of the project. While it is not anticipated that the majority of projects will take 30 months to close, the LGPO will ensure that prior to approval all applications satisfy all statutory

and regulatory requirements that they involve new and innovative technologies. The Department's regulations for the loan guarantee program detail how the Department will determine whether particular projects and technologies meet the statutory criteria of the Title XVII program for new and innovative technologies. As a part of the in-depth due diligence process, the LGPO will work in close consultation with independent engineering and market consultants on each project to continually assess the viability and relevance of the technology prior to issuing the loan guarantee as well as the long term viability of the markets the projects will serve. The Department also mitigates this risk by carefully outlining the requirements of project applications in its solicitations. Solicitations will be carefully crafted with input from various experts both within and outside the Department to solicit from the private sector applications that are both relevant and sustainable with the passage of time.

Chairman Visclosky. In planning how it will proceed with loan guarantee negotiations, to what extent is DOE able to take into consideration how quickly some new energy technologies in comparison to others are being developed?

Secretary Bodman. The LGPO, when evaluating the eligibility of applicants for loan guarantees and throughout the process of negotiating terms and conditions with eligible applicants, will give due consideration to the technological and commercial maturity of each project in its development cycle. For that purpose, the LGPO will draw upon technical appraisals from experts both within and outside the Department.

PROGRAM FRAMEWORK AND IMPLEMENTATION SPECIFICS

Chairman Visclosky. Given that the Loan Guarantee Program (LGP) is expected to be an independent entity housed in the CFO's office, what are DOE's plans to leverage the private sector funds from the loans to maximize the Department's energy goals?

Secretary Bodman. The Loan Guarantee Program Office is within the Chief Financial Officer's office, and the Director of the LGPO reports to the CFO. The LGPO is not "independent" of the CFO's office or of the Department. The two principal goals of the Title XVII Loan Guarantee Program are to encourage commercial use in the United States of new or significantly improved energy related technologies and to achieve substantial environmental benefits. In order to achieve these goals, the Department invites applicants to include eligible third party lenders for loan guarantees where the lenders would share the risk, including the borrowers' existing banks or other financial institutions, to provide funding for selected projects as a component of their application. By providing a loan guarantee to the existing financial relationship, the Department can mitigate some of the risk associated with a new and innovative technology, thereby maximizing both the goals of the Department and leveraging the private sector funds.

Chairman Visclosky. To what extent have you determined whether the Federal Financing Bank, which may take on the some of the loans' financing, is generally prepared to take on processing any additional workload related to DOE loan guarantees?

Secretary Bodman. The Loan Guarantee Program Office has been in close coordination with the staff of the FFB on accounting systems coordination for the entire loan process from origination to booking payments as well as requisite documentation. The LGPO has been assured by the FFB staff that the FFB has the capacity and staff to accommodate eligible projects approved for 100 percent loan guarantees.

Chairman Visclosky. You will lose 2 to 3 members of the Loan Guarantee Program advisory Credit Review Board over the next month or so. How are you ensuring that the board has sufficient capacity and balance to fulfill its responsibilities during a time when the LGP plans to issue solicitations and negotiate the first loan guarantees?

Secretary Bodman. In March 2007, I issued a Charter for the Credit Review Board, as required by the policies governing Federal Credit programs in OMB Circular A-129. The Board is responsible for establishing the overall policies and procedures for the loan guarantee program; coordinating credit management and debt collection activities; and making recommendations to me as to whether loan guarantee agreements should be executed. On February 7, I amended the Charter of the Board to provide a succession plan for the Chairmanship should there be a vacancy due to a resignation and to provide for instances where a Credit Review Board member is absent or has permanently vacated his or her seat or has recused himself or herself from a particular matter or matters. This revised Charter provides continuity of operations by the Credit Review Board.

ENVIRONMENTAL MANAGEMENT BUDGET – MISSING MILESTONES

Chairman Visclosky. Mr. Secretary, according to your testimony today EM's FY 2009 budget request of $5.528 billion "would not meet some of the milestones and obligations contained in all of the environmental agreements that have been negotiated over many years with regulators." Quantify for us how many of these missed milestones and obligations are due to lack of funding, and how many are due to other reasons, and what are those reasons?

Secretary Bodman. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the approximately 120 compliance milestones scheduled for completion in FY 2009, EM anticipates that 32 are at risk based on the program's expected performance through FY 2008.

Chairman Visclosky. Of the milestones and obligations the Environmental Management program will miss – do any subject the DOE to fines and penalties as the result of being missed? If so, how many, and for how much?

Secretary Bodman. Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated downward before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. If you need to "renegotiate" these missed milestones and obligations, how will the Congress know you are doing so in a fiscally responsible manner? Meaning, it's convenient to kick the can down the road and tie up the next Administration and Congress to future commitments – how does Congress know the extent of these new financial liabilities before you sign up to them?

Secretary Bodman. Negotiations with the Department's regulators generally provide for stakeholder and public input before agreements are finalized. Given the openness and duration of the process, Congress will have ample opportunity to conduct oversight.

EM COMPLEX-WIDE MANAGEMENT PLAN

Chairman Visclosky. Mr. Secretary, your Department is overseeing some very critical and complex reforms. The work you're doing to clean up radioactive sites is probably at the top of the list in terms of complexity. You've faced some hard questioning in the past regarding progress on several of these sites. Today, I'd like to step back a bit. The DOE complex-wide cleanup process involves, at its most basic, three levels – contaminated sites, processing, and the ultimate disposition of those materials. Each year this Subcommittee provides billions of dollars so that the clean-up process continues on all of those levels. However, if there's a hang-up at any one of these levels, billions of dollars may be lost, timelines slip by years, and lives are put at risk.

Can you provide for the Committee a complex-wide process flow – perhaps a flow diagram – which shows all materials that have been identified to be cleaned-up, how and where they will be processed, and where and when they will be ultimately disposed? This should identify source quantities, the capability of clean-up processes already built or planned to be built, and the capacity of repositories to take the material. It should also identify where new technologies need to be developed and, if necessary, when the current planned repositories will be filled.

Secretary Bodman. I agree with your assessment of the importance and complexity of managing the disposition of radioactive waste resulting from the Department's cleanup projects. The reorganization executed with the Environmental Management program last year helped restore their leadership in documenting and leading national waste management plans. We have

complex-wide management plans and process flow diagrams for the various waste types resulting from our cleanup programs. The data are derived from our project baselines, provide life cycle estimates, and are updated annually. The Waste Information Management System (WIMS), which generates life-cycle disposition maps through 2050 for the Department's low-level and mixed low-level radioactive waste, is available on the Internet (http://wims.arc.fiu.edu/WIMS/) and is maintained by Florida International University.

The WIMS data includes legacy material as well as newly generated waste from on-going Department activities. The disposition maps identify: waste type, generator site, physical form, projected volume, the general type of treatment required, and the disposal facility. Wastes that do not have a current disposition facility are labeled "To Be Determined." DOE sites and the headquarters oversight organizations, work together to establish final treatment and disposal paths for these wastes, and monitor capacity of existing disposal sites. Later this year we will add transuranic waste data to this system. I will work directly with your staff to determine the best way to demonstrate this system and provide additional complex-wide process information to your committee.

Chairman Visclosky. If not, why not? It would seem to me that a good program manager would need something like this to ensure that the plan could actually work. You have so many moving pieces, how can you be sure how decisions made at one site affect other parts of the process?

Secretary Bodman. The Office of Environmental Management uses a number of program and project management tools, in addition to the aforementioned Waste Information Management System, to ensure proper integration between sites. All of the EM projects have been baselined, and any changes to these baselines require impacts to be evaluated using rigorous baseline change controls. Interdependencies are evaluated as a part of this process. Additionally, the EM headquarters' offices provide assistance with integration within the EM program as well as with other departmental programs, and provide oversight to the EM projects, to ensure decisions are made on a complex-wide basis. The Nuclear Materials Disposition and Consolidation Coordination Committee, chaired by the principal deputy administrator of the NNSA, provides oversight for integration for materials such as plutonium and uranium.

Chairman Visclosky. What would it take to develop this basic management tool? How long, and how much money?

Secretary Bodman. We are continuing to add other waste and material information to the Waste Information Management System to increase the quality of our disposition data and maps. The 2009 budget includes approximately $195,000 to continue to develop and maintain it.

Chairman Visclosky. Perhaps we should use some program direction money to get this done. Are there any outside entities that could help supply DOE with the necessary project management experience and expertise?

Secretary Bodman. The Office of Environmental Management is currently utilizing program support funds for development of waste and materials integration tools and for project

management expertise with experience in waste management and data collection. The 2009 budget includes approximately $635,000 for these efforts. This is in addition to program support funds provided to Florida International University for the management of the Waste Information Management System.

Chairman Visclosky. A key assumption of DOE's high-level waste treatment and disposal strategy is that there will be adequate space in the Yucca Mountain geologic repository – the opening of which remains uncertain – for all of the high-level waste canisters produced by the Environmental Management program. Some estimates of the number of canisters DOE expects to produce, however, now exceed the space tentatively reserved for this waste at Yucca Mountain. Furthermore, waste from commercial nuclear reactors and naval reactors take priority over DOE's high-level waste. Given these uncertainties, how realistic is DOE's current high-level waste disposal strategy?

Secretary Bodman. The Office of Environmental Management's high-level waste (HLW) and spent nuclear fuel (SNF) projects assume the eventual availability of the Yucca Mountain repository for all HLW and SNF canisters EM prepares for disposal. The Nuclear Waste Policy Act (NWPA) currently limits the amount of SNF and HLW that can be emplaced in the first repository to 70,000 MTHM until a second repository is in operation. The Department plans to issue its report to Congress on the need for a second repository, as required by the NWPA, later this year. The Administration has also submitted legislation to Congress which, among other items, would remove the 70,000 MTHM cap on Yucca Mountain.

EM's current project plans also seek to minimize the total number of canisters that require disposal at Yucca Mountain. For example, for the tank wastes at the Hanford Site, we plan to separate the high activity and low activity fractions to reduce the number of HLW canisters requiring disposal at Yucca Mountain. At the Savannah River Site, we plan to utilize the H-Canyon facilities to process legacy spent nuclear fuel to minimize the number of SNF canisters requiring disposal. EM will continue to work closely with the Office of Civilian Radioactive Waste Management program to ensure the EM HLW and SNF plans are fully integrated with the Yucca Mountain repository plan.

Chairman Visclosky. In August 2007, the Savannah River Site estimated that the total number of high-level waste canisters generated by the Defense Waste Processing Facility (DWPF) could potentially increase by approximately 2,000 canisters to a total of approximately 7,900 canisters. If Yucca Mountain does not open by the department's current projection of 2017, how many glass waste storage buildings will be required at the Savannah River Site to store canisters generated by the DWPF?

Secretary Bodman. The upper limit of our estimate for the number of canisters of high-level waste that could be produced by the Defense Waste Processing Facility is 7,900; however, the Savannah River Site (SRS) plans to implement improved treatment technologies which will reduce the number of canisters to approximately 6,300 through the end of the liquid waste program. SRS currently has two glass waste storage buildings; one is full and the other, which is partially filled, is expected to be filled about 2017. A third storage building is planned which will provide the capability to store a total of about 6,900 canisters at SRS. The design life of the

glass waste storage buildings is 50 years. If the improved treatment technologies are not successful in reducing the number of canisters of high-level waste to 6,900 or less, additional capacity for a limited number of canisters will be built.

Chairman Visclosky. What strategy does DOE have to reduce the number of canisters generated by DWPF?

Secretary Bodman. The Department plans to implement improved waste treatment technologies such as aluminum dissolution and enhanced melter technologies to reduce the number of canisters of high level waste produced. The initial low-temperature version of aluminum dissolution was successfully implemented in early 2008, resulting in a reduction of about 100 canisters from earlier forecasts. In the future, an enhanced (higher temperature) aluminum dissolution process will be implemented, resulting in a significantly larger reduction in canisters. In addition, DOE is evaluating new melter technologies that will improve waste loading in canisters, and thus further reduce the total number of canisters produced.

Chairman Visclosky. Given that the number of canisters being generated by DWPF is already projected to increase, does it still make sense to generate still more canisters through operation of the H-Canyon facility for another decade?

Secretary Bodman. We believe that operating H-Canyon is in the best interest of the Department and the nation because it will reduce the risks and cost associated with managing our surplus special nuclear materials, such as enriched uranium and plutonium. While use of H-Canyon will generate additional liquid high-level waste containers, these are already accounted for in the site's current waste generation projections and have been determined to be manageable (the contribution of H-Canyon affluent to the tank farms makes up only about 5 percent of the total influx of material to the tank farms). Additionally, the dissolution of the Savannah River Site spent nuclear fuel will reduce the number of total canisters that require disposal at Yucca Mountain.

## GLOBAL NUCLEAR ENERGY PARTNERSHIP PROGRAM

### INTERNATIONAL GNEP COOPERATION

Chairman Visclosky. Mr. Secretary, despite two years of substantial cuts to the Administration's request for funds for the Global Nuclear Energy Partnership program from Congress, the Department has chosen, again, to request significant funds $301 million for FY 2009. Unfortunately, this Committee has yet to see any improvement in the disarray of activities known as GNEP. There is a new activity this year under the GNEP umbrella – "grid appropriate reactors," with a request of $20 million. It is described as follows: "Begin nuclear infrastructure assessment and assistance to developing countries to help them prepare to introduce nuclear energy and ensure it is accomplished to the highest levels of safety and safeguards. Two assessments and at least one assist visit are planned in developing countries using a team of national laboratory employees with experience in the International Nuclear Safety Program." Mr. Secretary, what are the "developing countries" that are referenced here?

Secretary Bodman. The countries referred to as "developing countries" are those countries that are potentially interested in deploying nuclear energy for the first time that have smaller electricity grids and less well-developed infrastructures. Countries that fall in this category, several of which have already become GNEP Partners, include: Bahrain, Ghana, Senegal, Nigeria, Morocco, Chile, Colombia, Paraguay, Peru, Uruguay, United Arab Emirates, Saudi Arabia, Jordan, Estonia and Romania.

Chairman Visclosky. What do these "assessments" involve?

Secretary Bodman. An assessment would likely consist of a team of experts working with the host country to evaluate the readiness of the country's infrastructure to implement nuclear energy. It is intended that the basis for conducting the assessment be the IAEA document "Milestones in the Development of a National Infrastructure for Nuclear Power." With this assessment the country would be able to define policies and/or programs to make the improvements needed to ready itself to move toward a decision on the introduction of nuclear energy. The exact mechanism to provide the assessment and related assistance is being defined as part of the GNEP Infrastructure Working Group through cooperation among the 21 GNEP Partner nations.

Chairman Visclosky. Is a "123 Agreement" or an agreement for nuclear cooperation necessary to share nuclear technology with these developing countries, subject to review by Congress? If not, why not?

Secretary Bodman. The need for a Section 123 agreement, or other agreement, depends on the nature of the cooperation contemplated, and is determined on a case-by-case basis. The Office of Nuclear Energy works with the Department's Office of General Counsel and the State Department to ensure 123 Agreements and other types of nuclear cooperation agreements are properly developed and executed.

Chairman Visclosky. The Office of Nuclear Energy has actively participated in cooperative agreements with countries that already have nuclear power – to share advances in technology. Why is the promotion of nuclear energy internationally with countries without nuclear energy within the scope of a DOE energy research and development program? What is the authorization for this program? What is the State Department's involvement?

Secretary Bodman. The Department of Energy has broad statutory authority under the Department of Energy Organization Act (e.g., section 102 (10)), the Energy Reorganization Act of 1974 (e.g., sections 103 (9) and 107 (a)), and the Atomic Energy Act of 1954 (e.g., section 31), to conduct activities that further DOE's missions and responsibilities, both domestically and internationally. Since its establishment in 1977, DOE has utilized these statutory authorities to engage in collaborative activities with governmental and other entities in countries around the world and across DOE's varied program missions – ranging from research and development into energy efficiency technologies to nuclear energy technologies.

Much of the Office of Nuclear Energy's current international engagement is a continuation of activities initiated several years ago under the Advanced Fuel Cycle Initiative (AFCI) program,

and continues today under that program. As described in the FY 2008 and FY 2009 congressional budget requests, DOE's work under the AFCI program involving the development of advanced, proliferation-resistant nuclear fuel technologies is based on substantial domestic activities and synergistic international collaboration to advance DOE's nuclear science and technology mission. Also, in today's globally integrated energy markets and with the recognition of global impact of human activities, national security and energy security requires cooperation with other nations. The Office of Nuclear Energy's international Global Nuclear Energy Partnership (GNEP) program supports this nuclear energy cooperation as described in the FY 2008 and FY 2009 congressional budget requests for the AFCI program. All of DOE's GNEP activities are conducted in close coordination with the Department of State.

Chairman Visclosky. Please provide us with a list of all foreign travel funded by the Nuclear Energy program taken in FY 2006 and through February 2008, by whom and for what purpose, including federal, contractor, and laboratory employees.

Secretary Bodman. Attached is a file of foreign travel activities that provides the requested information. All of the foreign travel identified was performed in support of the Department's mission.

THE COST OF GNEP FACILITIES

Chairman Visclosky. Mr. Secretary, the FY 2009 budget requests $33.4 million for transmutation research and development – which would fund "site evaluation and infrastructure design to support a nuclear fuel recycling center and an advanced recycling reactor." What is the timing of these facilities, and what would they cost?

Secretary Bodman. The request for the nuclear fuel recycling center and advanced recycling reactor facilities are included in the Consolidated Fuel Treatment Center and Advanced Burner Reactor budget lines, respectively. The specific reference cited in the question refers to evaluations of potentially larger-scale spent fuel recycling concepts, including initial site and infrastructure evaluations of potential sites interested in hosting GNEP fuel cycle facilities.

The cost of the separations facility would vary significantly depending on the facility size and technology selected; the cost of a commercial facility is expected to be less than $20 billion. It is our intent that a substantial portion of this cost be borne by the marketplace, not the taxpayer. Initial fast reactor designs range in size from 300 MWe to 500 MWe with costs ranging from $2 billion to $4.5 billion.

Industry proposed schedules call for deployment of prototype fast reactors between 2018 and 2025. We envision that construction of the nuclear fuel recycling center (fuel separations and fuel fabrication facility) could begin in the 2015-2020 timeframe and operation could begin sometime in 2020-2028. The siting and construction of a nuclear fuel recycling center and an advanced recycling reactor would be subject to the requirements of the National Environmental Policy Act.

Chairman Visclosky. Mr. Secretary, the FY 2009 budget requests $53 million for advanced fuels research, development and testing, which includes funding "to continue to develop cost, scope, and schedule information for a transient test capability which will enable the testing of advanced fuels." Is this a facility? What is the timing and cost of this activity?

Secretary Bodman. This is not a request for facility funds. The GNEP advanced fuels development program has as its mission qualification of transuranic bearing fast reactor fuels for a licensed advanced recycling reactor. Licensing of any new advanced fuel would require transient testing at some stage to investigate design and beyond–design basis reactor transients. This transient fuel testing would most likely be done in a single facility capable of simulating reactor flow and temperature conditions postulated for the recycling reactor. Having such a capability is important for the next generation of fast recycling reactors and the Department has been approached by both the French and Japanese fast reactor researchers to gain access to the now-shutdown U.S. Transient Reactor Test facility (TREAT) at Idaho National Laboratory, the only facility in the world capable of handling a multi-pin fuel assembly. There are concerns however, about the cost and schedule required to return this facility to an operating condition. Therefore, current efforts are being devoted to evaluate the options available to meet the program's testing needs. In the near term, it might be possible to make use of a small existing facility at Sandia National laboratory, called the Annular Core Research Reactor (ACRR) to support early, small-scale tests. In the longer term, the program will need larger-scale and more complex capabilities. Analysis of the cost and schedule to develop the needed transient test capability are under development and estimates will be available later this year.

Chairman Visclosky. The budget also cites the needs for improvements in existing DOE laboratory facilities. What laboratories, for what purpose and for how much?

Secretary Bodman. The Department is seeking to upgrade the facilities at Idaho National Laboratory and Los Alamos National Laboratory to provide remote transuranic fuel fabrication capabilities. The estimated costs are approximately $5 million at each laboratory over a 2-year time period.

Chairman Visclosky. Mr. Secretary, the FY 2009 budget requests $10.3 million for a "first-of-a-kind, world-class nuclear fuel cycle research, development, and demonstration facility." The budget also says the design could be up to 60 percent complete at the end of the fiscal year (FY 2009). Is this different from the nuclear fuel recycling center mentioned earlier?

Secretary Bodman. Yes, it is different from the nuclear fuel recycling center. The proposed nuclear fuel cycle research, development and demonstration facility (Advanced Fuel Cycle Facility-AFCF) would be a DOE operated government facility supporting lab-scale through engineering-scale technology improvement over the next 50 years.

Chairman Visclosky. What is the timing of this facility? Sooner than the nuclear fuel recycling center and advanced reactor? You're doing site evaluations on those already – are you doing site evaluation for the nuclear fuel cycle research facility?

Secretary Bodman. The timing of AFCF was initially envisioned in the 2020-2025 period, but is being evaluated as part of the GNEP path forward decision in 2008. The advanced fuel separation, transmutation fuel fabrication, and waste form development capabilities of the AFCF would be needed in parallel with the commercial recycling center to develop next-generation recycling technologies to improve efficiency and effectiveness of fuel cycle management in the Unites States for the next five decades.

Chairman Visclosky. What is the cost of this facility?

Secretary Bodman. At Critical Decision-0 in 2006, the cost range of this facility was estimated to be $1.5-3.0 billion. The cost range for this project is being revised based on conceptual design performed to date and engineering trade-studies as part of the GNEP path forward decision in 2008.

Chairman Visclosky. It is my understanding that the Department's environmental impact statement (EIS) for greater-than-class C waste includes waste volumes generated from the nuclear fuel cycle research, development, and demonstration facility – is this accurate? Seems a little optimistic considering the stage of development you currently are in. Please explain why these waste streams are included. How realistic are those waste stream volumes?

Secretary Bodman. Yes, that is accurate. As a specific action being considered in DOE's Programmatic Environmental Impact Statement (PEIS) for the Global Nuclear Energy Partnership program, construction and operation of the AFCF may be reasonably foreseeable. Under the National Environmental Policy Act, agencies must consider the reasonably foreseeable actions that could contribute to cumulative impacts. The waste volume estimates developed by DOE for the GNEP research facility are based on conceptual engineering design and past operating experience. We believe these estimates are reliable for the purposes of analysis in the greater-than-class C (GTCC) EIS.

Chairman Visclosky. How will the Department comply with the requirements of DOE Order 413.3A regarding all of these proposed GNEP facilities?

Secretary Bodman. The DOE research, development and demonstration facility (AFCF) will fully comply with the requirements of DOE Order 413.3A in accordance with DOE practices. Until the Department determines the GNEP path forward, it is premature to determine whether other facilities under GNEP that may be led by industry would need to comply with DOE Order 413.3A requirements.

SECRETARIAL DECISION ON GNEP: STATUS

Chairman Visclosky. According to the GNEP strategic plan, DOE plans to prepare a decision package by June 2008 so that the Secretary of Energy can make a decision whether to proceed with building a nuclear fuel recycling center and a prototype advanced recycling reactor, assuming (among other things) that a credible technology pathway has been developed and a credible business plan exists. What specific criteria will you use for your June 2008 decision

given the many technical, economic, and nonproliferation uncertainties surrounding the initiative?

Secretary Bodman. My decision in 2008 will be made as part of the Record of Decision (ROD) related to the GNEP Programmatic Environmental Impact Statement (PEIS). In addition to the potential environmental impacts evaluated in the PEIS, the ROD will also consider non-environmental issues, including strategic planning, technology readiness levels, R&D needs, and nonproliferation impacts. Industry inputs that will include business cases, conceptual design studies, and technology development roadmaps will also be considered. The information from supporting documents will be considered in the ROD and used by the Secretary to inform the decision on whether and how to proceed with GNEP.

GNEP TRAVEL VERSUS LAYOFFS

Chairman Visclosky. The Congress directed the Department to compete, in an open competition between the private sector, universities, and the labs, 50 percent of the research funding made available for the Advanced Fuel Cycle Initiative in FY 2008. The Office of Nuclear Energy has so far resisted implementing this congressional direction, in part claiming that they will have to lay off a number of employees at the national labs. While the Department makes unsubstantiated threats of layoffs, it has come to our attention that the Department has conducted extensive foreign travel in the name of GNEP, the Global Nuclear Energy Partnership. As you know, the Committee last week requested a detailed listing of all foreign travel conducted in relation to GNEP, with the answer due back to us no less than two days prior to your hearing today. We did not receive a timely answer to our request, but we understand that you received all of this information yesterday afternoon. So, I will ask you these questions directly since you have the benefit of having this detailed information at hand. What is the total number of foreign trips taken in which GNEP was one of the principal trip purposes?

Secretary Bodman. There have been 76 foreign trips taken in which GNEP was one of the principal trip purposes.

Chairman Visclosky. What is the list of destinations for these GNEP-related trips?

Secretary Bodman. The destinations for these trips include the following countries: Austria, Canada, China, France, Korea, Japan, Jordan, Kuwait, Turkey, Russia, Saudi Arabia, and United Arab Emirates.

Chairman Visclosky. How many DOE federal employees and contractors engaged in such foreign travel?

Secretary Bodman. There have been 46 federal and contractor employees engaged in such foreign travel.

Chairman Visclosky. What were the total costs of such GNEP-related foreign travel, and how were those costs distributed among the Nuclear Energy, Defense Nuclear Nonproliferation, Departmental Administration, and any other relevant appropriations accounts?

Secretary Bodman. The total costs of such GNEP-related travel were approximately $333,000. The costs have been borne primarily as follows:

| | |
|---|---|
| Office of Nuclear Energy | $ 304,500 |
| National Nuclear Security Administration | $ 11,250 |
| Departmental Administration | $ 17,250 |

TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest Country | Dest City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | ALIBERTI | GERARDO | Contractor | ANL | 200709041 | 4/21/2007 | 5/6/2007 | 2,000.00 | France | Nice | Traveler is coauthor of 2 papers to be presented at conference. With participation at conference, I will be informed of most recent progress on nuclear data measurements, evaluation and associated covariances. I will also attend meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems". In frame of AFCI program, a Work Package titled "Nuclear Data Sensitivity" that I am responsible for, in Transmutation Engineering area is devoted to uncertainty assessment of impact of nuclear data uncertainty on major neutronic parameters of reactors of interest for AFCI program and consequent definition of future needs | AF5820100 |
| NE | ALIBERTI | GERARDO | Contractor | ANL | 200709041 | 4/21/2007 | 5/6/2007 | | Italy | Rome | Personal leave and weekends | AF5820100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | 4,576.51 | Korea | Seoul | Will layover for 1 night in Seoul before traveling on to Daejeon. | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | | Korea | [Other] - Daejon | Participate in the design review of the next generation volooxidation equipment for the Korean I-NERI project. "Development of Voloxidation Process for Treatment of LWR Spent Fuel." Technical and planning meetings will be held with leaders from the INL and KAERI | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200603146 | 2/21/2006 | 2/28/2006 | | Korea | Seoul | Travelers with stop over in Seoul so that they can get the early AM flight back to the US | AF5805000 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | 4,273.00 | Korea | Seoul | Office Stop Over. Will travel from Seoul to Daejeon | AF5805100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | | Korea | [Other] - Daejeon | Discuss recent results on voloxidation research and plan continued testing parameters with KAERI | AF5805100 |
| NE | BATEMAN | KENNETH | Contractor | INL | 200703920 | 2/3/2007 | 2/9/2007 | | Korea | Seoul | Official layover. Will travel to US from Seoul | AF5805100 |
| NE | BENEDICT | ROBERT | Contractor | INL | 200602241 | 1/6/2006 | 1/13/2006 | 3,724.00 | Korea | Seoul | Attend the kick-off meeting for the US-KOREA I-NERI project, "Development of Head-end Pyrochemical Re | AF5805000 |
| NE | BENEDICT | ROBERT | Contractor | INL | 200602241 | 1/6/2006 | 1/13/2006 | | Korea | [Other] - Daejeon | Attend the kick-off meeting for the US-Korea I-NERI project, "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels." Technical and planning meetings will be held with leaders from the INL and KAERI | AF5805000 |
| NE | CAHALAN | JAMES | Contractor | ANL | 200707379 | 5/9/2007 | 5/17/2007 | 2,249.00 | Japan | Fukui | At the MONJU fast CRP meeting, present U.S. technical position for benefit of SFR Gen IV and GNEP program development support. At the TWG meeting, U.S. authorship of fast reactor status report to support GNEP/ABR technical project development and facilitate international cooperation on safety and licensing design features | AF5830100 |
| NE | CAHALAN | JAMES | Contractor | ANL | 200717226 | 10/22/2007 | 10/26/2007 | 2,577.71 | France | [Other] - Marcoule | Attend IAEA consultants meeting on benchmark analysis of PHENIX End-of-Life test as U.S. representative. Present U.S. technical position for benefit of SFR Gen IV and GNEP program development support. | AF5830100 |
| NE | CAPPIELLO | MICHAEL | Contractor | LANL | 200700669 | 10/24/2006 | 10/28/2006 | 3,314.96 | Russia | Moscow | US/Russia experts meeting on Civilian Nuclear Energy. Participate as subject matter expert in transmutation and fast reactor design. | AF5810100 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200504623 | 3/11/2006 | 3/18/2006 | 4,557.47 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO irradiations. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200614593 | 9/17/2006 | 9/30/2006 | 6,989.82 | Germany | [Other] - Karlsruhe | Tour of facilities and discussion of collaborations | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200614593 | 9/17/2006 | 9/30/2006 | | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA. Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU) | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200617313 | 10/13/2006 | 10/21/2006 | 5,221.67 | Japan | Tokyo | Layover in Tokyo before traveling on to Tsuruga | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200617313 | 10/13/2006 | 10/21/2006 | | Japan | [Other] - Tsuruga | Tour Nuclear Facilities in Japan at the request of JAEA. Attend GACID PMB Meeting at Tsuruga and tour facilities. Tour facilities at Oarai and Tokai/JOYO | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200703688 | 2/4/2007 | 2/8/2007 | 4,494.67 | France | [Other] - Cadarache | Attend GACID/JOYO and PMB meetings at Cadarache. Tour Nuclear Facilities at Cadarache at the request of CEA | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200708325 | 5/18/2007 | 5/21/2007 | 4,748.35 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | 4,960.78 | Japan | Tokyo | Layover in Tokyo before traveling on to Tsuruga by train | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Tsuruga | Tour Nuclear facilities in Japan at the request of JAEA. Attend GACID PMB Meeting at Tsuruga and tour facilities | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Mito | Tour Nuclear facilities in Japan at the request of JAEA. Attend JOYO irradiations agreement. Attend 30th Anniversary of JOYO reactor operations. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200710024 | 6/1/2007 | 6/11/2007 | | Japan | Tokyo | Tour Nuclear facilities in Japan at the request of CRIEPI | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200717423 | 10/6/2007 | 10/15/2007 | 4,106.69 | Japan | Tokyo | To attend the GIF and Bilateral meetings between JAEA and DOE | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | 3,202.40 | Korea | Seoul | To attend Advanced Fuel PMB Meeting | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | | Japan | Tokyo | Meet with CRIEPI to discuss collaborative transuranic fuel research. | AF5810000 |
| NE | CARMACK | WILLIAM | Contractor | INL | 200801213 | 11/24/2007 | 12/8/2007 | | Japan | [Other] - Mito | To attend GACID technical specialist meeting. | AF5810000 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | 2,671.05 | France | Montpellier | Official stop over | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | | France | [Other] - Nimes | The OECD/NEA Ninth Information Exchange Meeting will cover the role of partitioning-transmutation in advanced nuclear fuel cycles and performance of advanced reactors. The DOE/CEA meeting will discuss progress in actinide partitioning | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200614641 | 9/23/2006 | 9/30/2006 | | France | Montpellier | Official stop over | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200705980 | 3/18/2007 | 3/22/2007 | 2,881.11 | France | Paris | Participate in Forth OECD/NEA Working Party Expert Group Meeting on Chemical Partitioning Flowsheets and Separation Criteria. Keep U.S. Advanced Fuel Cycle R&D Program abreast of international developments in Spent Fuel Partitioning Flowsheet and Separation Criteria Development | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/20/2007 | 7/28/2007 | 5,800.36 | Japan | [Other] - Mito | Traveler will participate in the 2nd meeting of U.S. - Japan Fuel Cycle Technology Working Group and tour Tokai Plant. | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/20/2007 | 7/28/2007 | | Japan | [Other] - Misawa | Traveler will participate in tour of the Rokkasho Reprocessing Plant, in Misawa, Japan | AF5805100 |
| NE | COLLINS | EMORY | Contractor | ORNL | 200713308 | 7/20/2007 | 7/28/2007 | | Japan | Tokyo | 7/27- Overnight in Tokyo for travel back to US July 28, 2007 | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | 2,846.76 | France | Montpellier | Official Stop Over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | | France | [Other] - Nimes | The OECD/NEA Ninth Information Exchange Meeting will cover the role of partitioning-transmutation in advanced nuclear fuel cycles and performance of advanced reactors. The DOE/CEA meeting will discuss progress in actinide partitioning | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200614627 | 9/23/2006 | 9/30/2006 | | France | Montpellier | Official stop over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703590 | 2/3/2007 | 2/10/2007 | 3,167.43 | Korea | Seoul | 2/4, Official Stop Over | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703590 | 2/3/2007 | 2/10/2007 | | Korea | [Other] - Daejeon | Participate in discussions relating to the international collaboration to treat commercial nuclear spent fuel, specifically, research & development of advanced dry head-end processes (e.g., voloxidation). Participate in the 5th I-NERI Program Review Meeting. Participate in technical meetings regarding special projects. | AF5805100 |
| NE | DELCUL | GUILLERMO | Contractor | ORNL | 200703590 | 2/3/2007 | 2/10/2007 | | Korea | Seoul | 2/9 Official Stop | AF5805100 |
| NE | DIXON | BRENT | Contractor | INL | 200716215 | 10/1/2007 | 10/6/2007 | 4,221.91 | Austria | Vienna | INPRO collaborative project: GAINS, a Global Architecture of INL Based on Thermal and Fast Reactors with the inclusion of a Closed Nuclear Fuel Cycle. Participate in discussion of scenarios for transition to new thermal reactors. Include discussion of systems analysis to facilite transition | AF5800000 |
| NE | EHRESMAN | TERI | Contractor | INL | 200715470 | 9/12/2007 | 9/19/2007 | 4,429.65 | Austria | Vienna | Part of advanced team for IAEA Ministerial and booth support for DOE/GNEP exhibit at IAEA meeting | 101205200 |
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | [illegible] | France | Nice | Act as Technical Program Chair for International Conference on Nuclear Data for Science and Technology | AF5800000 |

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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | [illegible] | France | Aix-en-Provence | US/France GNEP Discussions and US/France I-NERI Reviews | AF5800000 |
| NE | FINCK | PHILLIP | Contractor | INL | 200707209 | 4/20/2007 | 5/1/2007 | | Germany | [Other] - Karlsruhe | AFCF discussions | AF5800000 |
| NE | FINCK | PHILLIP | Contractor | INL | 200804715 | 2/6/2008 | 2/13/2008 | 1,970.00 | France | Aix-en-Provence | Strategic Direction of Research in the US, GNEP R&D, and Reactor Physics | AF5852000 |
| NE | FITZGERALD | CHERYL | Contractor | INL | 200716264 | 9/14/2007 | 9/20/2007 | 5,316.00 | Austria | Vienna | As a member of the GNEP Ministerial team, I am responsible for the Secretary of Energy Briefing Book preparations. There are many last minute changes that must be accomplished. I am responsible for writing policy papers and other documents in support of the Ministerial. As a member of the GNEP International Office, I will be staffing the GNEP display and will talk to people from other countries about the GNEP Initiative who come to the display to learn about GNEP. | AF5850000 |
| NE | FITZGERALD | CHERYL | Contractor | INL | 200802498 | 12/8/2007 | 12/14/2007 | 4,204.78 | Austria | Vienna | The Global Nuclear Energy Partnership (GNEP) Steering Group Meeting is the first meeting of this committee since its establishment in September, 2007, by the GNEP Executive Committee. This Group will hear baseline briefing by the IAEA on policy issues that will impact the efforts of the Partnership, agree on an Action Plan for its future strategy, establish two working groups on Reliable Fuel Services and Infrastructure Development, and consider countries for potential membership. In light of the fact that the Partnership consists of 13 members and has 21 countries as observers, the use of teleconferencing/electronic media not feasible. | AF5850000 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200607863 | 5/13/2006 | 5/18/2006 | 2,609.75 | China | Beijing | Traveler will participate in the IAEA Technical Working Group on Fast Reactor Status of U.S. research on various fast reactor technologies and will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200703190 | 12/2/2006 | 12/9/2006 | 3,726.00 | Austria | Vienna | Attend 2 technical meetings, 1) Technical meeting on review of status of accelerator driven systems R&D and technology, and 2) Technical meeting on review of status of fast reactor R&D and technology. Objectives are to prepare inputs needed to update respective status reports. Participants are requested to provide corresponding national contributions, discuss overall structure of status reports and contribute towards drafting first draft of status reports. U.S. will benefit from meetings by gaining knowledge of status of fast reactor R&D and technology of IAEA member states. U.S. needs to participate due to partnership aspects of GNEP. | AF5810100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200707739 | 5/12/2007 | 5/19/2007 | 3,704.00 | Japan | [Other] - Tsuruga | The traveler will participate in the IAEA Technical Working Group on Fast Reactors. Status of U.S. research on various fast reactor technologies will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200707739 | 5/12/2007 | 5/19/2007 | | Japan | Kyoto | The traveler will participate in the IAEA Technical Working Group on Fast Reactor. Status of U.S. research on various fast reactor technologies will be presented with similar data provided on other international programs. | AF5830100 |
| NE | FUJITA | EDWARD | Contractor | ANL | 200801545 | 12/3/2007 | 12/8/2007 | 0.00 | Austria | Vienna | Attend two technical meetings. Objectives of two back-to-back Technical Meetings (1) "Technical Meeting on the review of status of accelerator driven system R&D and technology" and (2) "Technical Meeting on the review of status of fast reactor R&D and technology" are to prepare inputs needed to update respective status reports. The participants are requested to provide corresponding national contributions, to discuss overall structure of status reports and contribute towards drafting first draft of status reports. U.S. benefits from meeting by gaining knowledge of status of fast reactor R&D and technology of IAEA member states. | AF5810100 |
| NE | GOMBERT | DIRK | Contractor | INL | 200703887 | 3/25/2007 | 3/31/2007 | 4,188.40 | Italy | [Other] - Barga | INL is the lead laboratory for the Global Nuclear Energy Partnership Program, and is publishing the Integrated Waste Management Strategy in 2007. Dirk Gombert will present a summary of this strategy and the need for waste form data to the international audience at the Barga conference, March 26-29, 2007. | DH3000000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200703887 | 3/25/2007 | 3/31/2007 | | Italy | Pisa | Traveler will layover for a day in Pisa before traveling on to the U.S. | DH3000000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/7/2007 | 12/14/2007 | 2,874.00 | Japan | Tokyo | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group. | AF5830000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/7/2007 | 12/14/2007 | | Japan | [Other] - Mito-City, Ibaraki | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group. | AF5830000 |
| NE | GOMBERT | DIRK | Contractor | INL | 200801615 | 12/7/2007 | 12/14/2007 | | Japan | Nagoya | 3rd Meeting of the Global Nuclear Energy Partnership (GNEP) Waste Management Group. | AF5830000 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | 4,629.08 | Japan | Tokyo | Dr. Halsey will be participating in the 3rd Meeting of the GNEP Waste Management Group, participants will be from DOE, ANL, SRNL, LLNL, PNNL, INL and the JAEA. The working group is tasked with cooperation on mutually beneficial joint R&D for waste management under advanced fuel cycles. The traveler is a technical member of this working group. The meetings in Japan are for further definition of a joint R&D plan, and to establish writing assignments and content summaries for the initial Phase 1 report. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | [Other] - Mito | Dr. Halsey will be participating in a Site tour with the GNEP Waste Management Group. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | [Other] - Nagoy | Dr. Halsey will be part of the GNEP Waste Management Site tour. | AF5830100 |
| NE | HALSEY | WILLIAM | Contractor | LLNL | 200802094 | 12/8/2007 | 12/16/2007 | | Japan | Tokyo | Dr. Halsey will be participating in the 3rd Meeting of the GNEP Waste Management Group, participants will be from DOE, ANL, SRNL, LLNL, PNNL, INL and the JAEA. The working group is tasked with cooperation on mutually beneficial joint R&D for waste management under advanced fuel cycles. The traveler is a technical member of this working group. The meetings in Japan are for further definition of a joint R&D plan, and to establish writing assignments and content summaries for the initial Phase 1 report. | AF5830100 |
| NE | HAYES | STEVEN | Contractor | INL | 200615107 | 9/23/2006 | 9/29/2006 | 3,840.87 | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA. Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-8. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU). | AF5810000 |
| NE | HAYES | STEVEN | Contractor | INL | 200706354 | 4/17/2007 | 4/29/2007 | 3,995.77 | France | [Other] - Saclay and Cadarach | Saclay meeting with french legal representatives on JOYO Trilateral arrangements. Attend Phenix steering committee, US DOE/CEA Bilateral, and US DOE/CEA I-NERI meetings | AF5810000 |
| NE | HAYES | STEVEN | Contractor | INL | 200713373 | 7/21/2007 | 7/28/2007 | 3,758.67 | Japan | [Other] - Ibaraki | Attend US-Japan Fuel Cycle Technology Working Group (Japan Atomic Energy Agency). This meeting is arranged under a bilateral agreement between US-DOE and corresponding Japanese ministries. Discuss collaborative research opportunities in metallic fuel development for actinide transmutation under GNEP. | AF5810100 |
| NE | HERBST | RONALD | Contractor | INL | 200614842 | 10/13/2006 | 10/24/2006 | 5,216.30 | Australia | Sydney | Present paper as the author and support presentation of other papers that I am a co-author of. Obtain information on latest research performed in the area of the nuclear fuel cycle. To discuss immobilization technologies for waste and product streams from spent fuel treatment as part of the GNEP/AFCI program. Discuss results of testing performed by ANSTO on waste/product simulants to support the AFCI program and discuss future collaboration opportunities. | 29AF00000 |
| NE | HERRMANN | STEVEN | Contractor | INL | 200602262 | 1/6/2006 | 1/13/2006 | 3,694.32 | Korea | Seoul | Attend the kick-off meeting for the US-KOREA I-NERI project, "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels." Technical and planning meetings will be held with leaders from the INL and KAERI. Official Layover in Seoul before traveling on to Daejeon. | AF5805000 |
| NE | HERRMANN | STEVEN | Contractor | INL | 200602262 | 1/6/2006 | 1/13/2006 | | Korea | [Other] - Daejeon | Attend the kick-off meeting for the US-Korea I-NERI project, "Development of Head-end Pyrochemical Reduction Process for Advanced Oxide Fuels." Technical and planning meetings will be held with leaders from the INL and KAERI. | AF5805000 |
| NE | HILL | TONY | Contractor | LANL | 200614782 | 9/19/2006 | 9/30/2006 | 5,010.00 | France | [Other] - NIMES/GOV | Attend the Actinide and Fission Product Partitioning and Transmutation 9th Information Exchange Meeting | AF5820100 |



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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | HILL | ROBERT | Contractor | ANL | 200704724 | 3/11/2007 | 3/16/2007 | 3,732 00 | Russia | [Other] - Obninsk | Traveler will attend the first workshop for the US-Russia Civil Nuclear Energy Working Group in Moscow. Traveler will lead the Reactors Subgroup that will be tasked to identify and propose specific bilateral collaborations. This work will be consistent with fast reactor activities in the DOE GNEP Program | AF5855000 |
| NE | HILL | ROBERT | Contractor | ANL | 200704724 | 3/11/2007 | 3/16/2007 | | Russia | Moscow | Traveler will meet with team to prepare summary reports | AF5855000 |
| NE | HILL | ROBERT | Contractor | ANL | 200707840 | 4/22/2007 | 4/26/2007 | 3,000 00 | France | [Other] - Cadarache | Traveler will participate in DOE/CEA Collaboration Meeting on GNEP Technology. Traveler will lead discussions on reactor technology proposals. | AF5800000 |
| NE | HILL | ROBERT | Contractor | ANL | 200712249 | 6/25/2007 | 6/29/2007 | 4,000 00 | Austria | Vienna | Traveler will attend the second workshop for the U S.-Russia Civil Nuclear Energy Working Group in Vienna. Traveler will lead the Reactors Subgroup that will be tasked to identify and propose specific bilateral collaborations. This work will be consistent with fast reactor activities in the DOE GNEP program | AF5800000 |
| NE | HILTON | BRUCE | Contractor | INL | 200607393 | 4/23/2006 | 4/27/2006 | 3,211 10 | Austria | Vienna | Technical Meeting on Status and Trends in Water Reactor Fuel Performance and Technology | AF5810100 |
| NE | HILTON | BRUCE | Contractor | INL | 200615088 | 9/17/2006 | 9/30/2006 | | Germany | [Other] - Karlsruhe | Tour of facilities and discussion of collaborations. | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200615088 | 9/17/2006 | 9/30/2006 | 6,303 88 | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-9. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU) | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200703721 | 2/4/2007 | 2/9/2007 | 3,822 16 | France | [Other] - Cadarache | Attend GACID/JOYO and PMB meetings at Cadarache. Tour Nuclear Facilities at Cadarache at the request of CEA | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | 4,721 70 | Japan | Tokyo | Layover in Tokyo before Traveling on to Tsuruga by train | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Tsuruga | Tour Nuclear facilities in Japan at the request of JAEA. Attend GACID/PMB Meeting at Tsuruga and tour facilities | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | [Other] - Mito | Tour Nuclear facilities in Japan at the request of JAEA. Attend JOYO irradiations agreement. Attend 30th Anniversary of JOYO reactor operations | AF5810000 |
| NE | HILTON | BRUCE | Contractor | INL | 200710038 | 6/1/2007 | 6/11/2007 | | Japan | Tokyo | Tour Nuclear facilities in Japan at the request of CREIPI | AF5810000 |
| NE | HOFMAN | GERARD | Contractor | ANL | 200706213 | 3/18/2007 | 3/22/2007 | 2,900 00 | France | [Other] - Cadarache | Participate in the US-RF Workshop on Collaboration in Fuel Testing and Transmutation associated with the Global Nuclear Energy Partnership (GNEP) | AF5810100 |
| NE | IMEL | GEORGE | Contractor | ANL | 200512318 | 9/16/2005 | 9/15/2006 | 31,658 00 | France | [Other] - Cadarache | Continue DOE/CEA collaboration by actively participating in experimental programs in Europe. DOE gains immediate access to experimental data obtained in reactor physics programs in France, for relatively small amount of funding through this assignment. U S. has gained great deal of leverage; in FY06, traveler will conclude experimental interpretation of MUSE program and complete Phase 1B activities in TRADE program in Italy, analysis techniques developed in these programs will be transferable to RACE program in U.S ; anticipated that traveler will lead experimental teams from CEA and ENEA to assist in RACE Texas experiments in future | AF5820100 |
| NE | IMEL | GEORGE | Contractor | ANL | 200613860 | 9/21/2006 | 9/15/2007 | 56,000 00 | France | Aix-en-Provence | This travel continues the on-site collaboration between DOE and CEA at Cadarache. The collaboration in this fiscal year will involve active participation in the French Gen/V program, specifically in design of reactor called for by Ghrac (to be operational before 2018). Through this on-site collaboration, U.S. DOE will have access to French scenario and design studies, as well as experimental data from fast reactor experiments (e.g., ENIGMA) at relatively low cost | AF5820100 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200617057 | 10/14/2006 | 10/21/2006 | 2,747 76 | Austria | Vienna | Technology issues and options for global deployment of small & medium sized reactors. Topics on economics, safety, emergency planning, and reactor technologies for SMRs is relevant to IRIS project (ORNL is participant) and GNEP (ORNL is expected to be participant). | AF3610100 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200618390 | 11/5/2006 | 11/10/2006 | 2,426 91 | Spain | Santander | Traveler will participate in semi-annual meeting of IRIS (International Reactor Innovative & Secure) Consortium. ORNL has 2 I-NERI projects related to IRIS and results from these projects will be discussed. Also, IRIS is of interest to DOE as part of GNEP. Technical progress and design status of IRIS will be presented and plans for FY07 work scope will be discussed | AF363010 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200704599 | 3/11/2007 | 3/16/2007 | 3,031 17 | Russia | [Other] - Obninsk | US & Russian experts meeting on civilian nuclear energy. Participate as a subject matter expert in nuclear reactor design | DH3000000 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200704599 | 3/11/2007 | 3/16/2007 | | Russia | Moscow | US & Russian experts meeting on civilian nuclear energy. Participate as a subject matter expert in nuclear reactor design | DH3000000 |
| NE | INGERSOLL | DANIEL | Contractor | ORNL | 200801599 | 11/24/2007 | 12/1/2007 | 3,430 04 | Austria | Vienna | Attended INPRO Common user Criteria (CUC) consultancy meeting. Traveler is Director of GNEP Grid Appropriate Reactors Campaign, which is highly related to CUC activity | AF5855000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | 9,969 42 | Russia | Saint Petersburg | Meet 10/1/07 with KRI and VNIPIET Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for ANL The feasibility will assess using KRI facilities to perform coupled end-to-end tests of advanced separaoes flowsheets, including waste form development, under contract. 10/2-7/07, Rusatom conference, The 10th International Conference Safety of Nuclear Technologies Radioactive Waste and Spent Nuclear Fuel Management and participate in panel session on International Cooperation in radioactive waste and spent nuclear fuel management. | AF5800000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | | Russia | Moscow | Meet with VNIINM, Rusatom and Atominform, Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for Argonne National Laboratory 10/8-9/07 The feasibility study will assess using KRI facilities to perform coupled end-to-end tests of advanced separations flowsheets, including waste form development, under contract. VNIINM and Atominform have expertise in waste forms are to be sufficiently robust to meet U S Repository requirements | AF5800000 |
| NE | JARDINE | LESLIE | Contractor | INL | 200716564 | 9/28/2007 | 10/14/2007 | | Russia | Saint Petersburg | Meet 10/11-12/07 with KRI and VNIPIET Staff to discuss statement of work, cost estimates and plans to implement an advanced reprocessing and waste management paper feasibility study by Russians for ANL 10/10/07 The feasibility study will assess using KRI facilities to perform coupled end-to-end tests of advanced separations flowsheets, including waste form development, under contract. The flowsheets to be investigated will not separate pure plutonium and will provide fuel materials capable of fast burner reactor use. The waste forms are to be sufficiently robust to meet U S. repository requirements | AF5800000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200605424 | 3/11/2006 | 3/18/2006 | 4,416 87 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO irradiations | AF5800000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200609038 | 5/27/2006 | 6/4/2006 | 4,871 84 | France | Nice | The traveler will chair the European Materials Research Society EMRS Symposium N session on nuclear fuels. The traveler will present a lecture titled "Fuel Cladding Chemical Interaction Differences in Actinide Transmutation Metallic Fuels." Discussions on current and future collaborations with international partners will take place during the meeting. Concurrent to the latter part of the EMRS meeting, the traveler will attend the Materials Modeling and Simulation of Nuclear Fuels workshop | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200615113 | 9/23/2006 | 10/8/2006 | | France | [Other] - Nimes | Tour Nuclear Facilities at Cadarache at the request of CEA Attend FUTURIX PMB Meeting at Marcoule/Phenix Reactor and tour facilities. Attend and present papers at IEMPT-8. Meet with collaborative counterparts at Institute Transuranium of Elements(ITU) | AF5810000 |



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| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | KENNEDY | JOHN | Contractor | INL | 200615313 | 9/23/2006 | 10/6/2006 | 5,136.98 | Germany | [Other] - Karlsruhe | Tour facilities and discuss fuel properties measurements at Cadarache Sept 21-22, participate in the FUTURIX-FTA experiment and Phenix tradizione Steering Committee meeting on Sept 25 at the Marcoule/Phenix reactor in his capacity as the lead for the transmutation fuel fabrication. Participate and present a paper at the 9th OECD NEA in Nimes from Sept 26-29, meet with his counterpart(s) to update the US-EURATOM Advanced Nuclear Fuel Properties, Measurements, and Modeling I-NERI as project lead in Nimes during the IEMPT meeting and/or at the Institute for Transuranium Elements (ITU) in Karlsruhe, Germany | AF5810000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200706355 | 4/17/2007 | 4/29/2007 | 5,900.52 | France | [Other] - Saclay and Cadarach | Saclay meeting with french legal representatives on JOYO Trilateral arrangements. Attend Phenix steering committee, US DOE/CEA Bilateral, and US DOE/CEA INERI meetings. | AF5810000 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | 10,727.53 | France | [Other] - Dijon | Will chair a session and present an oral contribution titled "Production of Oxide and Nitride Powders Employing Auto-Ignition Combustion Synthesis." | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Germany | [Other] - Karlsruhe | Meet with counterpart to review results and discuss progress on his function as US lead for the DOE-EURATOM I-NERI on Advanced Nuclear Fuels Properties, Characterization Measurements, and Modeling required as part of the collaboraion | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Germany | Aachen | Present an invited lecture at the University of Aachen, discuss areas of potential collaboration, and interview a potential post-doctoral candidate. | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200711825 | 6/30/2007 | 7/16/2007 | | Belgium | Brussels | Travel to Brussels to catch flight back in US | AF5810100 |
| NE | KENNEDY | JOHN | Contractor | INL | 200717604 | 12/2/2007 | 12/8/2007 | 4,618.94 | Japan | [Other] - Mito | Attend GACID/JOYO Technical Specialist meeting on fuel sample fabrication and characterization for GMG/DJOYO irradiation testing agreement and tour facilities | AF5810100 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200604731 | 2/7/2006 | 2/11/2006 | 2,736.77 | France | Paris | Technical discussions on GNEP Initiative with Commissariat a l Energie Atomique (CEA) and DOE. | AF5700000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200605612 | 2/24/2006 | 3/1/2006 | 2,801.93 | Japan | Tokyo | Technical Discussions on GNEP with DOE and Japan | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200605624 | 3/14/2006 | 3/18/2006 | 2,938.50 | France | Paris | Discussions of trilateral collaboration with CEA (France) and JAEA (Japan) on partitioning of spent nuclear fuel | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200606589 | 3/25/2006 | 3/29/2006 | 5,493.50 | Russia | Moscow | Technical discussions on GNEP Initiative with Russian Officials | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200608022 | 5/19/2006 | 5/27/2006 | 4,474.50 | China | Beijing | Technical discussions on GNEP Initiative with Chinese officials | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200608022 | 5/19/2006 | 5/27/2006 | | Japan | Tokyo | Technical discussions on GNEP Initiatives with Japanese officials | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200610954 | 5/30/2006 | 6/2/2006 | 1,621.00 | Canada | [Other] - Chalk River | Technical discussions on GNEP initiative with DOE and Canadian officials | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200610954 | 5/30/2006 | 6/2/2006 | | Canada | Toronto | Tour Darlington Reactor Site | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200700594 | 10/24/2006 | 10/28/2006 | 3,500.00 | Russia | Moscow | Develop basis for formulation of a broad program of collaboration with Russian laboratories. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200707612 | 4/22/2007 | 4/26/2007 | 2,287.00 | France | Aix-en-Provence | Dr. Laidler is the U.S. lead for Work Package 7 of the DOE-CEA collaboration on advanced partitioning and transmutation technology development. This meeting is intended to foster cooperation in advanced nuclear fuel cycle technologies between France and the U.S. It is part of a continuing and highly successful collaborative exchange. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200711438 | 6/25/2007 | 6/29/2007 | 3,062.00 | Austria | Vienna | Discussion on contracts for future participation of Russian institutions in the GNEP program under the scope of the U.S.-Russia agreement for collaboration on civil nuclear energy | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200712485 | 7/20/2007 | 7/26/2007 | 3,543.00 | Japan | [Other] - Mito | James Laidler is the co-chair of the U.S. - Japan Fuel Cycle Technology Working Group, which will be meeting on July 23-25, 2007 at the Tokai Works of JAEA<br>Traveler departs U.S. on Jul20/2007; arrives Jul21/2007 (Saturday); Jul22/2007 is a Sunday, departs Japan for U.S. on Jul26/2007 | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200714833 | 9/22/2007 | 9/28/2007 | 4,500.00 | Russia | [Other] - Nizhny Novgorod | James Laidler will attend the Advanced Nuclear Fuel Cycle for the 21st Century seminar, organized under the aegis of the ISTC Scientific Advisory Committee. Laidler will is an invited speaker and will give presentations on the U.S. views and strategy for spent nuclear fuel partitioning and transmutation | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200713666 | 10/9/2007 | 10/13/2007 | 3,328.00 | Russia | Moscow | Discussion will center on the potential for U.S. participation in the design of a modern pilot-scale reprocessing plant to be built at Krasnoyarsk-26, Russian Federation. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200713666 | 10/9/2007 | 10/13/2007 | | Russia | Saint Petersburg | Discussion will center on the draft contract with Argonne National Laboratory for performance of separations processing testing at Khlopin Radium Institute. | AF5800000 |
| NE | LAIDLER | JAMES | Contractor | ANL | 200801116 | 12/2/2007 | 12/8/2007 | 1,443.00 | Russia | Moscow | Attend the Rosatom Conference, AtomEco 2007. Presentation invited by Rosatom | AF5805000 |
| NE | LAW | JACK | Contractor | INL | 200613580 | 9/22/2006 | 9/30/2006 | 5,030.29 | France | [Other] - Nimes | Present paper titled "Flowsheet testing of the Fission Product Extraction Process for the Separation of Cesium and Strontium from Spent Nuclear Fuel." Also, a trip has been arranged to Visit a CEA facility with gamma irradiation equipment installed to obtain information to aid in operation and testing of gamma irradiation equipment installed at the INL which will be used to support the AFCI program | AF5605100 |
| NE | LAW | JACK | Contractor | INL | 200614441 | 10/12/2006 | 10/24/2006 | 5,708.21 | Australia | Sydney | Present two papers as the author and support presentation of three other papers that I am a co-author of. Obtain information on latest research performed in the area of the nuclear fuel cycle. To discuss immobilization technologies for waste and product streams from spent fuel treatment as part of the GNEP/AFCU program. Discuss results of testing performed by ANSTO on waste/product simulants to support the AFCI program and discuss future collaboration opportunities | AF5605100 |
| NE | LAW | JACK | Contractor | INL | 200707122 | 4/28/2007 | 5/5/2007 | 5,540.59 | United Kingdom | Manchester - Sellafield | Presentation on INL and INC Separations and Radiochemistry activities will be made to Nexia Solutions. Topics of Advanced Fuel Cycle and Process Simulation will be discussed. Plant tours of Sellafield and Thorp will be taken. Goals: Establish technical topic areas for consideration of potential collaboration with INL. | AF5805100 |
| NE | LAW | JACK | Contractor | INL | 200713298 | 6/29/2007 | 9/9/2007 | 6,558.19 | Belgium | Bruges | Present a paper describing recent research in spent fuel treatment. Obtain information on latest research performed in the area of the nuclear fuel cycle and waste treatment technologies | AF5605100 |
| NE | MACLEAN | HEATHER | Contractor | INL | 200715647 | 10/7/2007 | 10/14/2007 | 5,283.55 | Russia | [Other] - Obninsk | October 9th, 12 & 13th Personal Leave.<br>Attend Fast Reactors & Liquid Metals in Power Industry of the 21st Century as a representative of the GNEP Fuels team and give a presentation on fast reactor fuel development in the U.S. | AF5810100 |
| NE | MACLEAN | HEATHER | Contractor | INL | 200718487 | 12/7/2007 | 12/20/2007 | 6,589.19 | Austria | Vienna | Traveler will be attending both meetings as a representative of the GNEP Transmutation Fuels team. Transmutation fuels are an important part of both of these meetings and it is important for a member of the GNEP Fuels Team to attend to learn about the current status of other national programs and to share the goals and status of the US fuels program. First meeting is "Development Needs for Deployment of Advanced Fuel Cycles." December 10-12. Second meeting is "Fast Reactor Fuel Consultancy." December 17-19. Staying in Vienna between meetings is more cost effective than coming back to the US between them | AF5810000 |
| NE | MALOY | STUART | Contractor | LANL | 200606741 | 4/17/2006 | 4/22/2006 | 3,540.33 | Switzerland | [Other] - Villigen | As the DOE representative for the Megapie_PIE steering committee, the traveler will attend the meeting on post-irradiation examination (Megapie PIE) meeting at the Paul Scherrer Institute during the meeting they will plan the post-radiation examination of the Megapie target and assure that important data is obtained from this unique target. | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709879 | 11/25/2006 | 12/2/2006 | 2,314.00 | France | Aix-en-Provence | Traveler will present on "Materials Issues for Innovative Nuclear Applications" | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709879 | 11/25/2006 | 12/2/2006 | | France | Aix-en-Provence | Traveler will present on "Materials Issues for Innovative Nuclear Applications" | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709879 | 11/25/2006 | 12/2/2006 | | France | [Other] - Cadarache | Collaboration meeting re: WP3 (CEA-AFCI) | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | 3,373.00 | Germany | [Other] - Karlsruhe | Traveler is on organizing committee of Workshop on Structural Materials for Innovative Nuclear Systems (SMINS) and presenting on "Fast Reactor Materials Development and Testing for the GNEP Program" | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | | Belgium | [Other] - Mol | Will travel by train | AF5820100 |

TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | MALOY | STUART | Contractor | LANL | 200709980 | 6/2/2007 | 6/9/2007 | | Belgium | [Other] - Mol | Update collaborations with Abdou Abderrahim in modeling and corrosion of materials in lead-bismuth. Meet researchers interested in potential postdoctoral appointments at LANL. Visit facilities at SCK CEN for future collaborations. | AF5820100 |
| NE | MALOY | STUART | Contractor | LANL | 200801792 | 12/1/2007 | 12/8/2007 | 2,673.00 | Austria | Vienna | Attend evaluation of the IAEA (International Atomic Energy Agency) sub-programme B.2 "Nuclear Power Reactor Fuel Engineering and Consultancy meeting | AF5810100 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200617443 | 9/16/2006 | 9/21/2006 | 4,271.01 | Austria | Vienna | Interact with IAEA meeting attendees on Global Nuclear Energy Partnership Program plan. Represent GNEP at poster presentation. | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200700429 | 1/27/2007 | 2/1/2007 | 3,476.65 | France | Paris | Work on WPFC Subgroup on Chemical Partitioning, Working Group on Separations Criteria, Working Group on Flowsheet Studies, Working Group of Fuel Cycle Transition Scenarios Studies. | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200704120 | 4/2/2007 | 4/7/2007 | 4,450.34 | France | Paris | Attend and participate in International Working group on Scientific Issues of the Fuel Cycle | 39AF00000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | | France | Aix-en-Provence | AFCI Bilateral agreement and I-Neri review meetings | AF5800000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | 4,603.49 | France | Paris | Working party fuel cycle, continue working discussions | AF5800000 |
| NE | MCCARTHY | KATHRYN | Contractor | INL | 200706828 | 4/22/2007 | 5/2/2007 | | Germany | [Other] - Karlsruhe | Meetings at FZK, meet with Concetta Fazio on NEA WPFC work. Also meet with Massimo Salvatores and team on Systems analysis. Tour facilities. | AF5800000 |
| NE | MEYER | MITCHELL | Contractor | INL | 200708439 | 5/18/2007 | 5/27/2007 | 5,387.53 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts. | AF5810000 |
| NE | MILLER | MICHAEL | Contractor | LANL | 200800156 | 11/11/2007 | 11/16/2007 | 3,109.00 | Japan | [Other] - Tokai Mura | Represent GNEP program in the safeguards area, present invited talk "Safeguards Research and Technology Development for the Global Nuclear Energy Partnership", discuss advanced safeguards R&D with international safeguards community | AF5605100 |
| NE | MINCHER | BRUCE | Contractor | INL | 200614439 | 9/22/2006 | 9/30/2006 | 4,507.79 | France | [Other] - Nimes | Present paper titled "Radiolytic Decomposition of the FPEX Process Solvent." Visit CEA facility with gamma irradiation equipment installed to obtain information to aid in operation and testing of gamma irradiation equipment installed at the INL which will be used to support the AFCI program. | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | | Korea | Seoul | Official Stop Over. Will travel to Daejeon from Seoul. | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | 0.00 | Korea | [Other] - Daejeon | Discuss recent results on vitrification research and plan continued testing parameters with KAERI | AF5805100 |
| NE | MORGAN | CALVIN | Contractor | INL | 200703979 | 2/2/2007 | 2/11/2007 | | Korea | Seoul | Official stop over. Will travel from Seoul to the US. | AF5805100 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | 4,374.70 | United Kingdom | London | Technical discussions on GNEP Initiative with United Kingdom Officials | KJ0100000 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | | France | Paris | Traveler will return home prior to departing for Russia on 3/29. | KJ0100000 |
| NE | NOWAK | DAVID | Contractor | ANL | 200607083 | 3/23/2006 | 3/29/2006 | | Russia | Moscow | Technical discussions on GNEP Initiative with Russian Officials. | KJ0100000 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200602413 | 5/1/2006 | 5/6/2006 | 3,318.00 | France | Paris | Participate in meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems"; in frame of AFCI program, a Work Package traveler is responsible for, in Transmutation engineering area is devoted to uncertainty assessment of impact of nuclear data uncertainty on major neutronic parameters of reactors of interest for AFCI program & consequent definition of future needs in improvement of nuclear data, meeting focused on assessment of status & needed improvement of advanced nuclear systems, including AFCI & GEN IV programs. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200617253 | 10/21/2006 | 10/28/2006 | 2,063.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program ENICMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code previously proposed by Argonne will be discussed. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | ANL | 200705640 | 4/21/2007 | 4/27/2007 | 3,663.00 | France | Nice | Traveler is classified of 2 presented papers at conference. Traveler will also attend a meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems." Meeting is focused on assessment of status and needed improvement of advanced nuclear systems including those of AFCI and Gen IV programs. Discussions and results exchange among participants to WPEC subgroup 26 will help better define directions for future measurements and evaluation for cross sections playing significant role in design of advanced reactors. | AF5820100 |
| NE | PALMIOTTI | GIUSEPPE | Contractor | INL | 200716563 | 10/14/2007 | 10/20/2007 | 3,693.29 | Czech Republic | Prague | Attend 4th Workshop on Neutron Measurements, Evaluations and Applications - Nuclear data needs for Generation IV and accelerator driven systems. Attend meeting of WPEC subgroup 26 on "Nuclear Data Needs for Advanced Reactor Systems Energy Systems." Present paper and give presentation at WPEC subgroup 26. A Work Package titled Nuclear Data Sensitivity, traveler is responsible for, in the Reactor Campaign area is devoted to the uncertainty assessment of the impact of nuclear data uncertainty on major neutronic parameters of the reactors of interest for the AFCI program and consequent definition of future needs in improvement of nuclear data. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200604090 | 3/11/2006 | 3/18/2006 | 4,748.59 | France | Paris | Collaboration agreement will be finalized for MONJU and JOYO Irradiation. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200608783 | 5/27/2006 | 6/3/2006 | 3,253.00 | Switzerland | Zurich | 7th MEGAFIE TECHNICAL REVIEW MEETING | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200706212 | 4/2/2007 | 4/7/2007 | 4,531.39 | France | Paris | Readiness for Irradiation | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | | France | Aix-en-Provence | Attend and participate in International Working group on Scientific Issues of the Fuel Cycle | 39AF00000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | 5,548.91 | France | Paris | AFCI Bilateral agreement and I-Neri review meetings | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200707430 | 4/20/2007 | 5/2/2007 | | Germany | [Other] - Karlsruhe | Working party fuel cycle, continue working discussions. | AF5800000 |
| NE | PASAMEHMETOGLU | KEMAL | Contractor | INL | 200804244 | 1/15/2008 | 1/21/2008 | 6,817.28 | Turkey | Ankara - Istanbul | Meetings at FZK, meet with Concetta Fazio on NEA WPFC work. Also meet with Massimo Salvatores and team on Systems analysis. Tour facilities | AF5800000 |
| NE | PETERS | MARK | Contractor | ANL | 200707820 | 4/22/2007 | 4/25/2007 | 2,627.00 | France | Aix-en-Provence | Attend meetings with the President of TAEK regarding Global Nuclear Energy Partnership. This trip has already been approved by HQ and a country cable has already been issued. Dr. Peters is the Head of DOE GNEP Waste Form Campaign and will be discussing potential collaborations with the French in this technical area. This meeting is intended to foster cooperation in advanced nuclear fuel cycle technologies between France and the U.S. It is part of a continuing and highly successful collaborative exchange. | AF5800000 |
| NE | PITCHER | ERIC | Contractor | LANL | 200601277 | 11/24/2007 | 11/29/2007 | 1,196.00 | Austria | Vienna | Preparation for the AccApp 08 meeting: chair selections, arrangement of sessions, proceedings publication | AF5820100 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200713406 | 7/20/2007 | 7/28/2007 | 48,184.00 | Japan | [Other] - Mito | Monica Regalbuto will be attending a meeting as a U.S. expert in separations technology. | AF5800000 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200713406 | 7/20/2007 | 7/28/2007 | | Japan | [Other] - Misawa | Tour the Rokkasho Reprocessing Plant. | AF5800000 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200801818 | 12/7/2007 | 12/13/2007 | 453.00 | Austria | Vienna | Pre-meetings with B.P. Singh, Nuclear Engineering Lead, to coordinate presentations and incorporate latest GNEP guidance from DOE/NE. | AF5800000 |
| NE | REGALBUTO | MONICA | Contractor | ANL | 200801818 | 12/7/2007 | 12/13/2007 | | Austria | Vienna | Attend IAEA Technical Meeting on "Development Needs for Deployment of Advanced Fuel Cycles" and present invited presentation titled "An Overview of the UREX+ Processes". This paper will (1) provide an overview of the UREX+ family of processes, (2) summarize all of the experimental testcases done, and (3) describe the tools used to design these processes. | AF5800000 |
| NE | RODGERS | ARTHUR | Contractor | LLNL | 200716608 | 9/16/2007 | 9/21/2007 | 3,419.04 | Japan | Tokyo | The US-Japan Joint Nuclear Energy Action Plan (JNEAP) was signed by the US and Japan in April 2007. This civil nuclear energy action plan builds upon the cooperative research and development discussions that have taken place between the US and Japan. This includes collaboration on policies and programs that support the construction and regulation of new nuclear power plants and strengthen the nonproliferation regime. The R&D activities of the Action Plan are designated through 8 GNEP R&D Working Groups which are co-chaired by a designated expert from the US and Japan respectively. | AF5850000 |

TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | SCOTT | SARA | Contractor | LANL | 200700741 | 10/24/2006 | 10/28/2006 | 7,374.06 | Russia | Moscow | US/Russia experts meeting on Civilian Nuclear Energy. Participate as subject matter expert in transmutation and fast reactor design. | AF5810100 |
| NE | SCOTT | SARA | Contractor | LANL | 200711252 | 5/25/2007 | 5/29/2007 | 3,651.03 | Austria | Vienna | As a SME in transmutation technologies, topics covered will include: international fuel services: monitoring, accounting, and control technologies, common vision; Advanced spent fuel processing and waste management, and fast reactors | AF5850000 |
| NE | SCOTT | SARA | Contractor | LANL | 200801081 | 11/3/2007 | 11/10/2007 | 5,819.00 | Austria | Vienna | Sara Scott will attend to contribute to the overall international GNEP Program and efforts. Her attendance at Technical Meeting/Workshop on Milestones for Nuclear Power Infrastructure Development is essential as she is the laboratory lead for infrastructure working group. | AF5850000 |
| NE | SCOTT | SARA | Contractor | LANL | 200801226 | 12/9/2007 | 12/14/2007 | 4,399.00 | Austria | Vienna | Sara Scott will provide support to the Infrastructure Working Group as well as contribute to the overall efforts of the International GNEP Program | AF5850000 |
| NE | SHEA | THOMAS | Contractor | PNNL | 200801661 | 11/10/2007 | 11/16/2007 | 3,285.94 | Austria | Vienna | Traveler will take part in a IAEA Consultancy Meeting to assist in drafting the document entitled "Viability of Sharing Facilities for Disposal of Spent Nuclear Fuel - Technical and Institutional Considerations". | AF5850000 |
| NE | SIEGEL | ANDREW | Contractor | ANL | 200716007 | 9/16/2007 | 9/20/2007 | 1,074.00 | Japan | Tokyo | The U.S -Japan Joint Nuclear Energy Action Plan (JNEAP) was signed by U.S. and Japan in April 2007. This civil nuclear energy action plan builds upon the cooperative research and development discussions that have taken place between U.S. and Japan. This includes cooperation on policies and programs that support the construction and regulation of new nuclear power plants and strengthen the nonproliferation regime. The R&D activities of the Action Plan are designated through 5 GNEP R&D Working Group which are co-chaired by a designated expert from the U.S. and Japan respectively. | AF5850000 |
| NE | SIMPSON | MICHAEL | Contractor | INL | 200717616 | 10/13/2007 | 10/21/2007 | 3,040.32 | Korea | [Other] - Dae | Will participate in 2nd project review meeting for I-NERI project and the Advanced Fuel Cycle Forum meeting. | AF580510 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | 2,816.62 | Korea | Seoul | Traveler will participate in the US-Korea ISCNEC Conference/meetings and obtain information about potential areas of cooperation for collaborations | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | | Korea | Taejon | As part of the conference, traveler will tour KAERI facilities in Taejon, South Korea | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200608206 | 4/29/2006 | 5/5/2006 | | Korea | Seoul | Complete participation in the JSNEC Conference/meetings | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | | Korea | Seoul | 2/4: Official Stop Over | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | 3,135.23 | Korea | [Other] - Daejeon | Participate in discussions relating to the international collaboration to treat commercial nuclear spent fuel, specifically, research & development of advanced dry head-end processes (e.g., voloxidation). Participate in the 5th I-NERI Program Review Meeting. Participate in technical meetings regarding special projects | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200703519 | 2/3/2007 | 2/10/2007 | | Korea | Seoul | 2/9: Official Stop | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | 10/15: Official Stop Over enroute to Daejeon, Korea | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | 3,445.77 | Korea | [Other] - Daejeon | To attend the 3rd ROK-USA Advanced Fuel Cycle R&D Forum; present a talk on current ORNL activities entitled "Overview of Advanced Fuel Cycle-Related Activities at ORNL"; and support the DOE HQ manager for GNEP R&D (Buzz Savage) | AF5805100 |
| NE | SPENCER | BARRY | Contractor | ORNL | 200717852 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | Official Stop Over enroute back to US | AF5805100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | 9,426.02 | France | Nice | traveler will attend conference and present paper titled: Thermodynamic Models simulations of Nuclear Fuel Materials | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Nice | Travelers is the Primary organizer of this workshop. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | weekend between meetings. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Traveler will attend invited lecture and meetings at CEA with colleagues. Title of lecture: Models and simulations of Thermodynamic properties of nuclear fuel | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Nonbusiness weekend | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | France | Paris | Traveler will present talk at conference titled "Prior Knowledge in Thermodynamic Models and Simulations." | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200609229 | 5/27/2006 | 6/26/2006 | | Romania | Bucharest | Personal leave | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | 4,168.19 | France | [Other] - Saclay | Traveler will give key note presentation titled: MODELS AND SIMULATIONS OF THERMODYNAMIC PROPERTIES AND TRANSPORT PHENOMENA | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | Paris | non-business days | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | [Other] - Grenoble | Traveler will attend a meeting to discuss experimental techniques and collaboration at Institut National Polytechnique de Grenoble (INPG) | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200701061 | 11/27/2006 | 12/7/2006 | | France | [Other] - CADARACHE | Traveler will give an invited seminar titled: MODELS AND SIMULATIONS OF THERMODYNAMIC PROPERTIES OF NUCLEAR FUELS | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | 4,466.00 | France | Aix-en-Provence | en-route and jet lag day | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | | France | Aix-en-Provence | Presentation of Los Alamos results in the area of materials for nuclear energy and discussion of US/France bilateral collaboration | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200705743 | 4/21/2007 | 4/28/2007 | | France | Aix-en-Provence | INERI International Nuclear Energy Research Initiative Meeting. Traveler will present LANL proposal titled Nuclear Fuel Performance discussions. | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716036 | 9/16/2007 | 10/6/2007 | 9,787.00 | Japan | Tokyo-To | The traveler is a part of the US delegation who will meet with the US-Japan working group on Nuclear Fuels Modeling and Simulation | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716036 | 9/16/2007 | 10/6/2007 | | Japan | Tokyo-To | Collaboration with Dec. Motoyasu Kinoshita, Drs. Stan and Kinoshita and organizers of the Materials Models and Simulations for Nuclear Fuels workshop to be held in December | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716036 | 9/16/2007 | 10/6/2007 | | Russia | [Other] - Nizhny Novgorod | The traveler is an invited presenter at the Advanced Fuel Cycle for 21st Century Conference in cooperation with the International Science and Technology Center (ISTC). The title of his presentation is "Models and Simulations of Advanced Nuclear Fuels". | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200716036 | 9/16/2007 | 10/6/2007 | | Romania | Bucharest | PERSONAL LEAVE | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200803396 | 1/13/2008 | 1/18/2008 | 4,835.00 | France | Paris | Fuels and materials for nuclear energy | AF5810100 |
| NE | STAN | MARIUS | Contractor | LANL | 200803396 | 1/13/2008 | 1/18/2008 | | France | Paris | Meeting with Nuclear Energy Agency Staff | AF5810100 |
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200617251 | 10/21/2006 | 10/26/2006 | 2,085.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program EMGMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code, previously proposed by Argonne will be discussed | AF5820100 |
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200702454 | 5/12/2007 | 5/17/2007 | 4,863.00 | France | Nice | U.S. is considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for long term growth of nuclear power and non-proliferating nuclear utilization internationally. Special sessions have been organized for area of Fuel Cycle and Waste Management along with others. This forum provides opportunity for traveler to exchange information with international meeting participants in areas of advanced nuclear systems and fuel cycle strategies being considered by these countries. Traveler will present as a Keynote Speaker the results of recent studies conducted in U.S. and Canada on advanced thermal-burner reactors | AF5830100 |



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TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | TAIWO | TEMITOPE | Contractor | ANL | 200715113 | 9/18/2007 | 9/22/2007 | 3,246.13 | France | Paris | The U.S. is considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for the long-term growth of nuclear power and non-proliferating nuclear utilization internationally. A new OECD/NEA "Ad Hoc Expert Group on Transition Scenarios from Thermal to Fast Reactors" is being convened to conduct a comprehensive analysis of issues that might arise during transition from the currently operating thermal reactors (LWRs) to rapid deployment of fast neutron systems. The group will focus on issues of interest to policymakers, by analyzing mass flows, management of fissile materials, etc. | AF5830100 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | 8,400.00 | France | [Other] - Saclay | Geometry and mesh generation is key enabling technology for simulations in both fusion and fission nuclear power. I will collaborate with personnel at the CEA Saclay site to integrate geometry and meshing technology into the French TRIPOLI Monte Carlo transport code. I will also work with the Salome team as part of an ongoing collaboration on reactor simulation. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | Marseille | Timothy Tautges has been invited to give a short course on his SciDAC work. This could result in other researchers building on the functional interfaces I have developed, which would result in components which could be leveraged at Argonne National Laboratory. During the Research Center portion of this program, I will jointly investigate the mathematical basis for hex mesh modification. This problem is important for simulations in both SciDAC and nuclear energy applications | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | [Other] - Cadarache | During this time, Timothy Tautges will be in France under a separate SS1 T form, traveling for a program under ORNL. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | Marseille | Timothy Tautges has been invited to give a short course on his SciDAC work. This could result in other researchers building on the functional interfaces Tautges has developed, which would result in components which could be leveraged at Argonne National Laboratory. During the Research Center portion of this program, Tautges will jointly investigate the mathematical basis for hex mesh modification. This problem is important for simulations in both SciDAC and nuclear energy applications. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200712814 | 7/21/2007 | 8/31/2007 | | France | [Other] - St. Paul Les Dulance | Timothy Tautges will meet with personnel performing reactor simulation code development, relevant to his GNEP work. | AF5800000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200801873 | 12/1/2007 | 12/5/2007 | 453.00 | France | Paris | Present work on hexahedral mesh generation and explore collaboration on the subject. Hexahedral meshes are used in the Argonne National Laboratory GNEP reactor simulation, particularly for fluid flow simulations | AF5830000 |
| NE | TAUTGES | TIMOTHY | Contractor | ANL | 200801873 | 12/1/2007 | 12/5/2007 | | France | [Other] - Chatette-sur-Loing | Present work on hexahedral mesh generation and explore collaboration on the subject. Hexahedral meshes are used in the Argonne National Laboratory GNEP reactor simulation, particularly for fluid flow simulations | AF5830000 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | 9,393.00 | France | Nice | Traveler will present on "Advanced Safeguards Research and Development Plan with an Emphasis on Its Impact" | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Enroute/Arrival | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Nonbusiness/Weekend | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Tour of Cadarache NDA labs | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | Aix-en-Provence | Traveler will present on "A Survey of Seven Measurement Techniques for Quantifying the Fissile Content in Spent Fuels" | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | [Other] - Avignon | Team will conduct an AREVA tour at Marcoule | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | [Other] - Avignon | Nonbusiness/Weekend | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | [Other] - Cherbourg | Enroute/Arrival | AF5830100 |
| NE | TOBIN | STEPHEN | Contractor | LANL | 200708676 | 5/12/2007 | 5/29/2007 | | France | [Other] - Cherbourg | Team will conduct an AREVA tour at La Hague | AF5830100 |
| NE | TODD | TERRY | Contractor | INL | 200704648 | 3/11/2007 | 3/17/2007 | 3,931.25 | Russia | [Other] - Obninsk | US and Russia experts meeting on Civil Nuclear Energy. Participate as a subject matter expert in fuel cycle and separations. Meeting is a follow-on to a joint US/ Russia collaborative agreement to expand global and bilateral nuclear energy cooperation, signed by President Bush and President Putin in December, 2006 | AF5810000 |
| NE | TODD | TERRY | Contractor | INL | 200707420 | 4/29/2007 | 5/5/2007 | 5,043.72 | United Kingdom | Manchester - Sellafield | Presentation on INL and INL Separations and Radiochemistry activities will be made to Nexia Solutions. Topics of Advanced Fuel Cycle and Process Simulation will be discussed. Plant tours of Sellafield and Thorp will be taken. Goals: Establish technical topic areas for considerations of potential collaboration with INL | AF5825100 |
| NE | TODD | TERRY | Contractor | INL | 200711324 | 6/25/2007 | 6/29/2007 | 3,046.72 | Austria | Vienna | Attending the second US-Russian Civilian Nuclear Energy Working Group Meeting | AF5810000 |
| NE | TODOSOW | MICHAEL | Contractor | BNLEE | 200709125 | 5/18/2007 | 5/26/2007 | 8,472.95 | Russia | [Other] - Dimitrovgrad | Multiple papers will be presented by US participants. Traveler will presenting a paper entitled "Electronic Thermal-Hydraulics Studies of Transmutation Fuels" General outline of the GNEP TRU Fuel Development Program will be presented to Russian counterparts | AF5810100 |
| NE | TODOSOW | MICHAEL | Contractor | BNLEE | 200709125 | 5/18/2007 | 5/26/2007 | | Russia | [Other] - Samara | Official Stop over enroute to airport via U.S. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200706487 | 4/14/2007 | 4/28/2007 | 3,914.19 | France | Aix-en-Provence | Discussion will be held regarding the metal and nitride fuel types fabricated in the US and the decision by the Phenix safety authority regarding the suitability of these fuels for irradiation. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | | Russia | Moscow | Train from Moscow to Dimitrovgrad (Ulyanovsk region) | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | 4,877.50 | Russia | [Other] - Ulyanovsk | The traveler is an expert in this area of advanced ceramic nuclear fuels and will deliver three presentations at the 8th Russian Conference on Reactor Material Science | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200709138 | 5/18/2007 | 5/27/2007 | | Russia | Moscow | return back to US | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200800356 | 12/22/2007 | 12/8/2007 | 2,879.00 | Japan | [Other] - Oarai | Site visits - Japan Atomic Energy Agency (JAEA) Naka/ Tokai. | AF5810100 |
| NE | VOIT | STEWART | Contractor | LANL | 200800368 | 12/22/2007 | 12/8/2007 | | Japan | [Other] - Oarai | Attend Technical specialists meeting to discuss fuel fabrication and characterization for GACID agreement | AF5810100 |
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200603512 | 2/21/2006 | 2/28/2006 | 4,455.12 | Korea | Seoul | Travelers will stop over in Seoul before traveling on to Daejeon | AF5805000 |
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200603512 | 2/21/2006 | 2/28/2006 | | Korea | [Other] - Daejeon | Participate in the design review of the next generation volatilization equipment for the Korean NNERI project, "Development of Volatilization Process for Treatment of LWR Spent Fuel." Technical and planning meetings will be held with leaders from the INL and KAERI | AF5805000 |
| NE | WAHLQUIST | DENNIS | Contractor | INL | 200603512 | 2/21/2006 | 2/28/2006 | | Korea | Seoul | Travelers will stay in Seoul in order to catch early flight out back to US. | AF5805000 |
| NE | WALLACE | RICHARD | Contractor | LANL | 200718214 | 10/8/2007 | 10/13/2007 | 5,329.00 | Russia | [Other] - Obninsk, | Attend Workshop on Fast Reactors and Liquid Metals in Power Industry of the 21st Century in Obninsk, Russia | AF5855000 |
| NE | WIGELAND | ROALD | Contractor | ANL | 200615784 | 9/23/2006 | 9/30/2006 | 2,878.00 | France | [Other] - Nimes | Presentation of an invited paper detailing the reprocessing and recycling requirements necessary to obtain waste management benefits on a geologic repository, which forms the basis of one of the fundamental US-DOE GNEP program objectives. | AF5830100 |
| NE | WILLIAMS | KENT | Contractor | ORNL | 200517608 | 10/14/2006 | 10/21/2006 | 3,900.21 | Austria | Vienna | Technology issues and options for global deployment of small & medium sized reactors. Topics on economics, safety, emergency planning, and reactor technologies for SMRs is relevant to IRIS project (ORNL is participant) and GNEP (ORNL is expected to be participant). | AF3650200 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | 3,158.00 | Korea | Seoul | Overnight stay prior to departure for Daejeon. | AF5800000 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | | Korea | [Other] - Daejeon | Third Republic of Korea (ROK) - USA Advanced Fuel Cycle R&D Forum. Serve as a technical representative on pyrochemical processing for Department of Energy, Office of Advanced Nuclear Energy Research | AF5800000 |
| NE | WILLIAMSON | MARK | Contractor | ANL | 200718281 | 10/14/2007 | 10/20/2007 | | Korea | Seoul | Overnight stay prior to departure for U.S. | AF5800000 |
| NE | YANG | WON | Contractor | ANL | 200607421 | 5/27/2006 | 6/3/2006 | 2,809.23 | France | [Other] - Cadarache/Aix-en-Prove | Workshop for "Modeling Advanced Nuclear Systems with the ERANOS Code" will provide good opportunity to access ERANOS code system for Advanced Burner Test Reactor (ABTR) and Advanced Burner Reactor (ABR) design applications | AF5830100 |

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01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest Country | Dest City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | YANG | WON | Contractor | ANL | 200614199 | 9/10/2006 | 9/15/2006 | 2,843.00 | Canada | Vancouver | PHYSOR 2006 will allow discussing most important scientific results obtained worldwide in reactor physics area, traveler is Argonne manager responsible for Reactor and Fuel Cycle Analyses, he is responsible for design and analysis of advanced Gen IV nuclear systems, with primary focus on ABTR; will deliver paper on sodium-cooled fast reactor (SFR) design studies and chair session on reactor physics methods, obtain activities ongoing internationally in areas of reactor physics methods and SFR design studies. | AF5810100 |
| NE | YANG | WON | Contractor | ANL | 200617171 | 10/21/2006 | 10/26/2006 | 2,121.00 | France | Aix-en-Provence | Meet with CEA colleagues to discuss different topics that are part of CEA/DOE AFCI collaborations & I-NERI projects. In particular, review of experimental program ENIGMA & its design will be performed taking into account contributions of ANL to experimental planning. Potential physics experiments that could be used to support development of NGNP/VHTR will be discussed. New capabilities for future general geometry neutronic code will be evaluated. Methodology for uncertainty evaluation capability in COSI code previously proposed by Argonne will be discussed. | AF5820100 |
| NE | YANG | WON | Contractor | ANL | 200708171 | 5/12/2007 | 5/17/2007 | 5,428.00 | France | Nice | U.S. considering advanced nuclear systems, fuel cycles and strategies to provide innovative solutions for long term growth of nuclear power and non-proliferating nuclear utilization internationally. Three sessions have been organized in ICAPP 2007 for area of Sodium-cooled Fast Reactors, along with those of others (Fuel Cycle and Waste Management, etc.). Forum provides opportunity to exchange information with international meeting participants in areas of advanced sodium-cooled fast reactor systems and fuel cycle strategies being considered by these countries. Traveler will present results of ABTR core design studies conducted in U.S. | AF5855000 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200608559 | 5/26/2006 | 6/5/2006 | 2,563.38 | Austria | Vienna | Attend the Meetings of the Technical Working Group on Nuclear Fuel Cycle Options and spent Fuel Management (TWGNFCO) at IAEA, Vienna. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200615349 | 9/26/2006 | 9/29/2006 | 1,839.64 | Canada | Ottawa | Attend Nuclear Energy Research Initiative meeting | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200707885 | 4/20/2007 | 4/28/2007 | 3,220.86 | France | Aix-en-Provence | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboration annual review. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200713630 | 8/11/2007 | 8/17/2007 | 5,981.34 | Russia | Saint Petersburg | Discussion will center on the potential for U.S. participation in the design of a modern pilot-scale reprocessing plant to be built at Krasnoyarsk-26, Russian Federation. | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200715512 | 10/5/2007 | 10/13/2007 | 5,981.34 | Austria | Vienna | Present Global Nuclear Energy Partnership paper at IAEA Working Group on Nuclear Fuel Cycle Options | KK0501211 |
| NE | BRESEE | JAMES | DOE Federal Employee | NE | 200715512 | 10/5/2007 | 10/13/2007 | | Russia | Saint Petersburg | Participate in feasibility study at Khlopin Radium Institute | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200609085 | 4/22/2006 | 4/27/2006 | 1,114.35 | Belgium | Brussels | ATTEND MEETINGS WITH THE CENTRE (WITH MARK GINSBERG) TO DISCUSS ADMINISTRATION POLICY OF VOLUNTARY ACTIONS TO HELP ACHIEVE CLIMATE CHANGE | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611795 | 5/30/2006 | 6/2/2006 | 2,043.57 | Canada | Ottawa | Discussions with AECL, Canada on GENP cooperation and tour of CANDLE reactor | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611982 | 6/12/2006 | 6/12/2006 | 463.75 | Canada | Toronto | ATTEND CANADIAN NUCLEAR SOCIETY CONFERENCE TO PROVIDE AN UPDATE ON THE GLOBAL NUCLEAR ENERGY PARTNERSHIP INITIATIVE | KK0501211 |
| NE | BROWN | LARRY | DOE Federal Employee | NE | 200611396 | 6/17/2006 | 6/23/2006 | 2,401.24 | Austria | Vienna | U.S Representative to International Atomic Energy Agency Conference on Management of Spent Fuel from Nuclear Power Reactors in cooperation with the OECD Nuclear Energy Agency. | KK0501211 |
| NE | CLAPPER | MAUREEN | DOE Federal Employee | NE | 200605906 | 2/25/2006 | 3/1/2006 | 2,244.52 | Austria | Vienna | Brief IAEA on the Global Nuclear Energy Program. | KK0501211 |
| NE | CLAPPER | MAUREEN | DOE Federal Employee | NE | 200716360 | 9/13/2007 | 9/21/2007 | 3,654.47 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference | KK0501211 |
| NE | DICKENS | SHERRI | DOE Federal Employee | NE | 200716361 | 9/13/2007 | 9/17/2007 | 2,434.21 | Austria | Vienna | Provide support for the GNEP Ministerial Conference | KK0501211 |
| NE | DICKENS | SHERRI | DOE Federal Employee | NE | 200801362 | 12/7/2007 | 12/14/2007 | 3,764.10 | Austria | Vienna | Attend and provide logistical and credentialing support for the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | GILLESPIE | MARY | DOE Federal Employee | NE | 200707618 | 3/31/2007 | 4/5/2007 | 11,276.48 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U.S./Japan Action Plan on Nuclear Energy. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200608439 | 4/11/2006 | 4/12/2006 | 2,380.71 | Canada | Ottawa | Meetings with the Canadians regarding the Global Nuclear Energy Partnership (GNEP) | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200609275 | 5/29/2006 | 6/2/2006 | 1,982.99 | Switzerland | Zurich | Attend MEGAPIE Steering Committee meeting. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200616226 | 9/17/2006 | 9/30/2006 | 4,967.55 | Germany | Frankfurt am Main | Visit laboratories regarding advanced transmutation fuel development. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200616226 | 9/17/2006 | 9/30/2006 | | France | Paris | Participate in OECD/NEA meeting on actinide and fission product partitioning and transmutation. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200618069 | 10/13/2006 | 10/21/2006 | 2,967.27 | Japan | Tokyo-To | Promotion of GACID and Joyo for the Japan/France/United States Trilateral Collaboration Project. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200707886 | 4/18/2007 | 4/27/2007 | 3,312.30 | France | Paris | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboration annual review. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200709475 | 6/1/2007 | 6/9/2007 | 3,475.39 | Japan | Tokyo City | To participate in Global Actinide Cycle International Demonstration (GACID)and JOYO meetings. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200711193 | 6/24/2007 | 6/29/2007 | 2,562.29 | Austria | Vienna | To attend the second US/Russia workshop on civil Nuclear Energy Cooperation, in accordance with the Oct. 15th 2007 US/Russia Action plan | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/29/2007 | 2,158.48 | Germany | Frankfurt am Main | Participate in MEGAPIE Steering Committee meeting. | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/29/2007 | | Germany | [Other] - Karlsruhe | Visit Karlsruhe Energy Research Center | KK0501211 |
| NE | GOLDNER | FRANK | DOE Federal Employee | NE | 200801631 | 11/24/2007 | 11/29/2007 | | Switzerland | Bern | Attend meetings with Paul Scherrer Institute regarding GNEP | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200708001 | 4/2/2007 | 4/6/2007 | 2,150.27 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U.S./Japan Action Plan on Nuclear Energy. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200707827 | 4/22/2007 | 4/28/2007 | 3,048.52 | France | Paris | Attend the 114th Session of the Steering Committee for Nuclear Energy at OECD/NEA. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200713485 | 7/16/2007 | 7/20/2007 | 2,591.54 | Switzerland | Bern | To discuss IRR concept and attend the GIF meeting. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200718420 | 9/14/2007 | 9/20/2007 | 2,729.41 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200718420 | 9/14/2007 | 9/20/2007 | | Austria | Vienna | | KK0501211 |
| NE | GOLUB | SAL | DOE Federal Employee | NE | 200801229 | 11/10/2007 | 11/20/2007 | 5,358.38 | Japan | Tokyo City | To attend an Executive Committee Meeting "Japanese Fuel Cycle Management meeting. | KK0501211 |
| NE | GRIFFITH | ANDREW | DOE Federal Employee | NE | 200706888 | 4/20/2007 | 4/27/2007 | 4,492.82 | Japan | Nagoya | Participate in the 15th International Conference on Nuclear Engineering (ICONE15) | KK0501211 |
| NE | GROSS | JOHN | DOE Federal Employee | NE | 200715372 | 8/31/2007 | 9/4/2007 | 3,326.94 | Belgium | Brussels | Attend International Conference on Environmental Remediation and Radioactive Waste Management Conference | KK0501211 |
| NE | GUITH | CHRISTOPHER | DOE Federal Employee | NE | 200716271 | 9/12/2007 | 9/20/2007 | 3,786.56 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200604785 | 2/7/2006 | 2/14/2006 | 2,357.01 | France | Paris | Technical discussions on GNEP initiative with Commissariat a l'Energie Atomique (CEA) and DOE | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200605741 | 2/25/2006 | 3/1/2006 | 4,070.90 | Japan | Tokyo | Technical discussions on GNEP initiative with Japan. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200606760 | 3/22/2006 | 3/29/2006 | 4,522.08 | United Kingdom | London | Technical discussion on GNEP initiative with UK and DOE. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200606740 | 3/22/2006 | 3/29/2006 | | Russia | Moscow | Technical discussion on GNEP initiative with Russia and DOE. | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200610749 | 5/19/2006 | 5/27/2006 | 10,299.68 | China | Beijing | Technical discussions on GNEP initiative with Chinese officials | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200610749 | 5/19/2006 | 5/27/2006 | | Japan | Tokyo | Technical discussions on GNEP initiatives with Japanese officials | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200614815 | 8/18/2006 | 8/22/2006 | 2,292.83 | Japan | Tokyo City | Global Nuclear Energy Partnership (GNEP) Collaborative Research and Development Separations and Reactor Technology meetings with Japan Atomic Energy | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200701043 | 11/14/2006 | 11/17/2006 | 1,934.81 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENTS BUSH AND PUTIN ON DECEMBER 15, 2006 POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200708078 | 3/11/2007 | 3/16/2007 | 2,881.58 | Russia | [Other] - Obninsk | First U.S./Russia Workshop on International Cooperation under the Joint Action Plan | KK0501211 |

TRAVEL BY NA, NE, NA AND SY 01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | B&R Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200705171 | 6/10/2007 | 6/16/2007 | 2,361.11 | France | Paris | To attend annual OECD/NEA Nuclear Science Committee Meeting and hold virtual discussions with CEA on GNEP | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200711794 | 6/24/2007 | 6/29/2007 | 2,879.17 | Austria | Vienna | To attend the second US/Russia workshop on civil Nuclear Energy Cooperation, in accordance with the Dec. 15th 2007 US/Russia Action plan | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200713487 | 7/10/2007 | 7/13/2007 | 3,143.64 | China | Beijing | To meet with the Chinese Government to discuss preparations for the May 21 international meeting on GNEP that Chairman Ma Kai was invited to attend by Secretary Bodman | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200802195 | 11/25/2007 | 11/29/2007 | 3,020.62 | China | Beijing | Hold first GNEP Action Plan Technical Cooperation meeting per the U.S./China Plan Appendix | KK0501211 |
| NE | HERCZEG | JOHN | DOE Federal Employee | NE | 200802026 | 12/9/2007 | 12/14/2007 | 3,151.88 | Austria | Vienna | Attend GNEP Steering Group Meeting | KK0501211 |
| NE | KNOX | GREGORY | DOE Federal Employee | SY | 200713736 | 7/14/2007 | 7/18/2007 | 2,209.19 | Austria | Vienna | Meeting with IAEA and Austria Conference Center staff to discuss logistics and a walk-thru for the September GNEP Ministerial meeting | KK0501211 |
| NE | KNOX | GREGORY | DOE Federal Employee | SY | 200716167 | 9/5/2007 | 9/19/2007 | 4,386.09 | Austria | Vienna | To support the GNEP Ministerial Meeting | KK0501211 |
| NE | LANNEMAN | WILLIAM | DOE Federal Employee | NE | 200801593 | 12/5/2007 | 12/14/2007 | 4,186.32 | Austria | Vienna | Participate in the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | | Japan | Tokyo | Participate in the 3rd Meeting of the GNEP Waste Management Group | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | 3,365.66 | Japan | [Other] - Mito | Participate in a Site tour with the GNEP Waste Management Group. | KK0501211 |
| NE | LESICA | SUSAN | DOE Federal Employee | NE | 200801632 | 12/8/2007 | 12/14/2007 | | Japan | [Other] - Nagoya | GNEP Waste Management Site tour. | KK0501211 |
| NE | LISANN | ELIZABETH | DOE Federal Employee | NE | 200801368 | 12/5/2007 | 12/14/2007 | 4,571.18 | Austria | Vienna | Attend and provide logistical and credentialing support for the Global Nuclear Energy Partnership Steering Group Committee meeting. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200701995 | 12/11/2006 | 12/8/2006 | 3,013.23 | Austria | Vienna | Attend workshop on Issues for the Introduction of Nuclear Power and discuss infrastructure requirements with IAEA staff | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200713488 | 7/16/2007 | 7/20/2007 | 2,418.44 | Switzerland | Bern | To discuss IRR concept and attend the GIF meeting. | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200716558 | 9/14/2007 | 9/20/2007 | 3,128.83 | Austria | Vienna | Attend IAEA General Conference | KK0501211 |
| NE | LISOWSKI | PAUL | DOE Federal Employee | NE | 200801441 | 11/10/2007 | 11/20/2007 | 0.00 | Japan | Tokyo City | To attend an Executive Committee Meeting - Japanese Fuel Cycle Management meeting | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200700875 | 10/24/2006 | 10/28/2006 | 986.00 | Russia | Moscow | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENT S BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS WILL ALSO BE DISCUSSED AT THE MEETING | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200701235 | 11/14/2006 | 11/19/2006 | 2,295.49 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENTS BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200702215 | 12/1/2006 | 12/12/2006 | 3,550.32 | Austria | Vienna | Attend workshop on Issues for the Introduction of Nuclear Power and discuss infrastructure requirements with IAEA staff<br>Traveler will take leave 12/7-8/06. | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200707765 | 3/31/2007 | 4/6/2007 | 8,639.41 | Japan | Tokyo-To | Attend meetings with the Japanese Government to sign the U S /Japan Action Plan on Nuclear Energy | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200713555 | 7/10/2007 | 7/13/2007 | 15,176.98 | China | Beijing | To meet with the Chinese Government to discuss preparations for the May 21 international meeting on GNEP that Chairman Ma Kai was invited to attend by Secretary Bodman | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200716548 | 9/13/2007 | 9/20/2007 | 3,197.79 | Austria | Vienna | IAEA conference and GNEP Ministerial Mtg | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200800762 | 11/26/2007 | 12/1/2007 | 0.00 | China | Beijing | Attend meeting with regarding public release of our joint nuclear energy cooperation plan | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200801370 | 12/9/2007 | 12/14/2007 | 2,640.04 | Austria | Vienna | Chair the Global Nuclear Energy Partnership Steering Group Committee meeting | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200804533 | 1/15/2008 | 1/18/2008 | 2,580.54 | Turkey | Ankara - Istanbul | Attend meetings with the President of TAEK regarding Global Nuclear Energy Partnership | KK0501211 |
| NE | MCGINNIS | EDWARD | DOE Federal Employee | NE | 200805543 | 2/4/2008 | 2/7/2008 | 1,036.00 | United Kingdom | London | Meet with Marvin Draper and Mark Higson to provide a briefing on GNEP and to discuss other specific issues. | KK0501211 |
| NE | MCLEAN-WHEELER | SHANE | DOE Federal Employee | NE | 200716370 | 9/12/2007 | 9/20/2007 | 3,592.81 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200611794 | 10/14/2006 | 10/18/2006 | 2,363.83 | Austria | Vienna | Attend IAEA Technical Meeting to "Review the Enabling Technology for Small and Medium Sized Reactors (SMRS)" | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200704449 | 2/3/2007 | 2/7/2007 | 2,169.06 | Austria | Vienna | Attend IAEA Consultancy Meeting to review implementation approach to define common user criteria for developing and deploying reactors in developing countries. | KK0501211 |
| NE | PRICE | ROBERT | DOE Federal Employee | NE | 200802194 | 12/9/2007 | 12/14/2007 | 2,905.78 | Austria | Vienna | Attend GNEP Steering Group Meeting | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200605740 | 2/25/2006 | 3/4/2006 | 8,344.16 | Japan | Tokyo | Technical discussions on GNEP Initiative with Japan. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200606892 | 3/22/2006 | 3/29/2006 | 3,090.55 | United Kingdom | London | Technical discussion on GNEP Initiative with UK and DOE | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200606892 | 3/22/2006 | 3/29/2006 | | Russia | Moscow | Technical discussion on GNEP Initiative with Russia and DOE | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200609079 | 4/24/2006 | 4/28/2006 | 10,634.25 | Japan | Tokyo | Attend Japan Atomic Industrial Forum conference and meetings to discuss GNEP. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200610753 | 5/19/2006 | 5/24/2006 | 8,647.85 | China | Beijing | Technical discussions on GNEP Initiative with Chinese officials. | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200614233 | 8/3/2006 | 8/6/2006 | 10,034.10 | United Kingdom | London | Followup meetings with UK Government regarding the Global Nuclear Energy Partnership | KK0501211 |
| NE | REIS | VICTOR | DOE Federal Employee | NE | 200611572 | 9/19/2006 | 9/22/2006 | 7,444.43 | France | Paris | Meetings w/CEA officials J Bouchard, P. Pradel, and others regarding GNEP. Also give lecture at CEA managers conference | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | | Korea | Seoul | Stay over in Seoul before flying on to Daejeon | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | 2,828.46 | Korea | [Other] - Daejeon | Work with State Department to perform a review of KAERI's programs in both pyroprocessing and DUPIC KAERI would like to have the opportunity to discuss areas for additional collaborations. Also participate in discussions about the use of spent fuel in their new hot cell facility | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200603389 | 1/21/2006 | 1/27/2006 | | Korea | Seoul | Overnight stay en route to U S | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200605585 | 3/11/2006 | 3/18/2006 | 2,444.24 | France | Paris | Meetings with CEA on France-Japan collaborations on global actinide cycle international demonstration at Monju reactor and trilateral collaboration into advanced reprocessing technology. Also continuation of negotiations and program planning activities ongoing from fiscal year 2005 | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200614617 | 8/18/2006 | 8/22/2006 | 2,264.99 | Japan | Tokyo City | Global Nuclear Energy Partnership (GNEP) Collaborative Research and Development Separations and Reactor Technology meetings with Japan Atomic Energy. | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200618070 | 10/13/2006 | 10/21/2006 | 2,837.70 | Japan | Tokyo-To | Promotion of GACID and Joyo, Japan/France/United States Trilateral Collaboration Project | KK0501211 |
| NE | SAVAGE | CARTER | DOE Federal Employee | NE | 200717851 | 10/12/2007 | 10/20/2007 | 3,577.71 | Korea | Seoul | Attend and participate in the U.S./Korea I-NERI Annual Review. | KK0501211 |
| NE | SCHUPPNER | SUIBEL | DOE Federal Employee | NE | 200615023 | 9/26/2006 | 9/29/2006 | 1,889.31 | Canada | Ottawa | Participate in the U S -Canada International-Nuclear Energy Research Initiative (I-NERI) Annual Review Meetings. | KK0501211 |
| NE | SCHUPPNER | SUIBEL | DOE Federal Employee | NE | 200708189 | 4/24/2007 | 4/28/2007 | 2,232.52 | France | Aix-en-Provence | Participate in bilateral meetings with French CEA on I-NERI and AFCI research collaboration annual review | KK0501221 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200707991 | 4/12/2007 | 4/3/2007 | 1,855.85 | Canada | Ottawa | Meeting on fuel cycle and the Global Nuclear Energy Partnership | KK0501211 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200713157 | 7/14/2007 | 7/18/2007 | 2,456.92 | Austria | Vienna | Meet with IAEA and Austria Conference Center staff to discuss logistics and do a walk-thru for the September GNEP Ministerial meeting | KK0501211 |
| NE | SCOTT | MICHELLE | DOE Federal Employee | NE | 200716358 | 9/9/2007 | 9/19/2007 | 4,243.00 | Austria | Vienna | Attend IAEA General Conference and GNEP Ministerial Conference. | KK0501211 |
| NE | SINGH | BHUPINDER | DOE Federal Employee | NE | 200800746 | 12/7/2007 | 12/13/2007 | 2,970.88 | Austria | Vienna | Participate in IAEA Technical Meeting on Development Needs for Deployment of Advanced Fuel Cycles | KK0501211 |

TRAVEL BY NA, NE, NA, AND SY
01/01/06 - 02/15/08

| Approving Office | Last Name | First Name | Employee Type | Site | TR # | Departure Date | Return Date | Cost | Dest. Country | Dest. City | Justify Trip Purpose | BAR Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NE | SPURGEON | DENNIS | DOE Federal Employee | NE | 200700936 | 11/14/2006 | 11/18/2006 | 2,777.13 | Austria | Vienna | MEETING TO FINALIZE THE JOINT REPORT OF THE U.S./RUSSIA CIVIL NUCLEAR ENERGY WORKING GROUP THAT IS DUE TO PRESIDENT S BUSH AND PUTIN ON DECEMBER 15, 2006. POSSIBLE AREAS OF COOPERATION AND TECHNICAL SITE VISITS ALSO WILL BE DISCUSSED AT THE MEETING. | KK0501211 |
| NE | SPURGEON | DENNIS | DOE Federal Employee | NE | 200715604 | 9/13/2007 | 9/20/2007 | 4,014.03 | Austria | Vienna | Attend IAEA General Conference | KK0501211 |
| NE | STOUT | DANIEL | DOE Federal Employee | NE | 200800216 | 10/13/2007 | 10/19/2007 | 3,387.50 | France | Paris | Tour Lahague, Melox, and Phenix facilities | KK0501211 |
| NE | SZYMANSKI | WILLIAM | DOE Federal Employee | NE | 200801367 | 12/9/2007 | 12/14/2007 | 2,720.96 | Austria | Vienna | Attend and present information on the Nuclear Fuel Services Working Group for the Global Nuclear Energy Partnership Steering Group Committee meeting | KK0501211 |
| NE | SZYMANSKI | WILLIAM | DOE Federal Employee | NE | 200805542 | 2/4/2008 | 2/7/2008 | 1,036.00 | United Kingdom | London | Meet with Malvin Draper and Mark Higson to provide a briefing on GNEP and to discuss other specific issues. | KK0501211 |
| NE | JACOBS | JENNIFER | Other Federal Employee | NE | 200608440 | 4/17/2006 | 4/12/2006 | 1,370.75 | Canada | Ottawa | Meetings with the Canadians regarding the Global Nuclear Energy Partnership (GNEP). | KK0501211 |

'OFFICIAL USE ONLY'

Chairman Visclosky. What is your specific statutory authorization to engage with any foreign countries or enlist foreign partners in GNEP?

Secretary Bodman. As noted in the answer to question 43, DOE has broad statutory authority under the Department of Energy Act (e.g., section 102 (10)), the Energy Reorganization Act of 1974 (e.g., sections 103 (9) and 107 (a)), and the Atomic Energy Act of 1954 (e.g., section 31), to conduct activities that further DOE's missions and responsibilities, both domestically and internationally. In the case of GNEP, much of DOE's international engagement is a continuation of activities initiated several years ago under the AFCI program and continues today under that program.

Chairman Visclosky. What specific appropriations, if any, were made available for any foreign activities under AFCI or GNEP?

Secretary Bodman. DOE's international activities under AFCI and GNEP are a continuation of activities initiated several years ago under the AFCI program, which continues today with the support and funding provided by Congress (i.e., Revised Continuing Appropriations Resolution, 2007 (P.L. 110-5) and Consolidated Appropriations Act, 2008 (P.L. 110-161)). The Department's FY 2007, 2008, and 2009 congressional budget requests describe DOE's work under the AFCI program involving the development of advanced, proliferation-resistant nuclear fuel technologies based on substantial domestic activities and necessary international collaboration to advance the goals of GNEP.

Chairman Visclosky. The Committee does not appreciate being threatened with layoffs at the labs, given the amount of resources the Department has spent on unnecessary foreign travel related to GNEP, an activity that is not specifically authorized and has no legitimate source of appropriated funds. Can you explain why you think it is more important to enlist international support for GNEP when you have not succeeded in enlisting solid domestic support for that initiative?

Secretary Bodman. International collaboration is an essential element of GNEP and a prerequisite to meeting GNEP's goals. As a practical matter, collaborating with our international partners offers significant benefits and an opportunity for substantial cost savings. In order to achieve these benefits, some foreign travel is necessary. U.S. technical representatives travel to foreign locations and similarly, foreign visitors travel to U.S. locations to share technical expertise, tour facilities, or conduct research.

The U.S. advanced fuel cycle activities and funding significantly declined through the 1980s and 1990s, resulting in limited expertise and a decaying domestic infrastructure. Meanwhile, our

foreign partners (mostly France and Japan) have made significant progress in developing recycling technologies and the relevant infrastructure. In the last 8 years, we have gained significant access to their personnel and facilities, thus allowing us to bootstrap our program, move towards rebuilding our capabilities, and integrate our international partners' most recent results. Savings associated with the work with the French alone are estimated to be as high as $100 million, mostly through the integration of results that could not be obtained in the United States. That level of collaboration can only be achieved through significant personal investment and direct contact between U.S. and foreign researchers.

The Unites States currently lacks many of the facilities required to support a closed fuel cycle. For example, we have no operating commercial-scale separations plant or operating sodium fast reactor. Collaboration with GNEP foreign partners is therefore necessary, at least until the United States has sufficiently rebuilt the required domestic infrastructure that will ultimately be staffed by Americans.

GNEP STRATEGY FY 2009

Chairman Visclosky. The Department has changed strategies on GNEP several times. Please explain the latest strategy – what separation process will be used, what kind of reactor will burn the recycled spent fuel, who will pay for commercial-scale facilities, etc.?

Secretary Bodman. While the GNEP vision has not changed since GNEP's introduction, the implementation planning has matured based upon continuous assessments of the technologies and inputs from industry, international partners, and the public as outlined in the GNEP Strategic Plan of January 2007. The Department continues to evaluate various approaches, including those that involve industry leadership in developing and building a nuclear fuel recycling center to separate wastes from usable elements in existing reactor used nuclear fuel using technologies that are available today. The usable elements (uranium and transuranics) could be recycled in thermal or fast reactors, or both. Fast recycling reactors would be needed in the future to maximize destruction of transuranics, extracting the most energy from the fuel, and reducing the high level waste that would require geologic disposal. The Department would continue to lead the R&D effort to improve separations and fast reactor technologies to make them economical and sustainable.

PRIOR SPENT FUEL REPROCESSING LESSONS

Chairman Visclosky. There have been previous attempts in the United States to reprocess spent nuclear fuel – for example, the West Valley Demonstration Project from 1966 to 1972, which failed even before the Presidential decision later in the 1970s to halt reprocessing based on proliferation concerns. What lessons have been learned from previous failed efforts that are being applied to GNEP? What has changed that would justify reprocessing now, despite the risks involved?

Secretary Bodman. The West Valley separation plant in New York State for the treatment of used nuclear fuel was operated by Nuclear Fuel Services, Inc. for 6 years using the PUREX solvent extraction process developed by what were then the U.S. Atomic Energy Commission

national laboratories. The West Valley success during the processing of used fuel from five different commercial power reactors was sufficient to lead two other U.S. commercial companies to design and build processing plants in Illinois and South Carolina to satisfy the perceived market for used fuel recycle. The West Valley Demonstration Project is the name of the U.S. government/New York State Energy Research and Development Authority joint project authorized by federal law in 1980 which successfully solidified the high level waste resulting from the original plant operation. Based on the technology successfully employed at West Valley, commercial used fuel recycling plants have been built and operated in five other countries. All use PUREX, which separates pure plutonium.

One of the goals of GNEP is to move as rapidly as possible toward recycle technologies that do not separate pure plutonium, but instead lead to the consumption of plutonium already separated to reduce proliferation risks and recover energy. GNEP recognizes that large-scale reprocessing already exists and attempts to limit its spread and shift from more hazardous to less hazardous separations processes.

Separations processes that do not separate pure plutonium are being developed through DOE's Advanced Fuel Cycle Initiative (AFCI) as well as by GNEP partners. DOE national laboratories and other fuel cycle country organizations, in coordination with the IAEA, are developing advanced instrumentation that will provide real-time information on the location and characteristics of all hazardous materials, thus greatly strengthening facility safeguards of commercial-scale separations plants.

The number of foreign countries using spent fuel reprocessing has increased since the U.S. decision. GNEP seeks to limit any further increase while providing technologies that do not separate pure plutonium and instrumentation to improve greatly the safeguards protection of the current facilities.

Furthermore, one of the goals of AFCI has been to develop separations processes that do not result in long-term storage of liquid HLW in order to improve waste management. To address concerns prompted by historical releases of liquid HLW from underground storage tanks, the GNEP program would not support any long-term storage of liquid HLW.

## MIXED OXIDE (MOX) FUEL FABRICATION FACILITY

### DESIGN-BUILD

Chairman Visclosky. Mr. Secretary, can you tell me all of the material that the Department is now considering to send to the Mixed Oxide (MOX) Fuel Fabrication Facility in Savannah River, South Carolina?

Secretary Bodman. The Department will use the U.S. MOX facility to dispose of at least 34 metric tons of surplus weapon-grade plutonium oxide, which includes both nuclear weapons pit and certain other non-pit plutonium metal and oxide material. As described in a technical report that the Department submitted to Congress in July 2007, the Department is also considering sending additional plutonium from nuclear weapons pits declared surplus to national security

needs, and additional amounts of non-pit plutonium, pending further environmental and technical analysis and final decisions by the Department. Also, as described in the July 2007 technical report, the facility may provide an option to fabricate initial core loads for fast reactors to support the Global Nuclear Energy Partnership, depending on analysis and decisions which could optimally be made well into the future.

Chairman Visclosky. Will the MOX facility as designed accept all of the plutonium feed now under consideration, and if not, what additional design work is required? Will any design changes be needed to produce start-up fuel for fast reactors?

Secretary Bodman. Since the July 2007 Technical Report was issued, DOE continues to conduct technical, economic, and environmental analyses concerning the disposition of surplus weapons-usable plutonium originally intended for the cancelled immobilization facility. Updated analysis suggests that the H Canyon would be technically more suitable and efficient for the disposition of certain impure and very impure plutonium, including certain impure plutonium (approximately 2 metric tons) previously discussed as potentially suitable for the MOX facility (with certain minor equipment and related modifications) in the July 2007 Technical Report and referenced in the September 2007 *Plan for Alternative Disposition of Defense Plutonium and Defense Plutonium Materials That Were Destined for the Cancelled Plutonium Immobilization Plant.* Although final decisions have not been made, if the Department decides to use H Canyon as the disposition path for such impure and very impure material, the MOX facility will be able to accept all other plutonium feed now under consideration (no design changes would be required) including 9 metric tons of plutonium recently declared surplus to defense needs. Minor design modifications to the MOX facility would be required to adjust certain processes and equipment to fabricate start-up fuel for fast reactors, if the Department were to decide to so use the MOX facility to support the Global Nuclear Energy Partnership.

Chairman Visclosky. There have been reports about the Nuclear Regulatory Commission (NRC) surfacing concerns about the risk of a "red oil" explosion in the MOX project as presently designed. What can you tell me about this problem and how DOE is addressing it in the design of the MOX facility?

Secretary Bodman. I am informed that a "Red Oil" accident is a runaway reaction between two chemicals (tri-n-butyl phosphate, TBP, and nitric acid) used in the processing of plutonium and uranium that could generate excessive pressurization and even detonation. This type of accident has occurred in the past at several nuclear facilities around the world, most recently in Russia in 1993. In order to ensure the safety of existing U.S. Department of Energy plutonium facilities, the Defense Nuclear Facilities Safety Board (DNFSB) issued a list of acceptable control methods in 2003 to be used in order to avoid conditions that could lead to a "Red Oil" accident.

The U.S. MOX facility will use TBP and nitric acid as part of its process for purifying plutonium prior to making nuclear reactor fuel. The design of the U.S. MOX facility incorporates a number of DNFSB accepted controls and will meet Nuclear Regulatory Commission (NRC) requirements for avoiding a "Red Oil" accident. The controls incorporated into the MOX facility design include: process temperature limits, removal of TBP prior to process heating, venting of

process vessels to avoid pressure buildup, and limiting acid concentrations to safe levels. Prior to its issuance of a Construction Authorization in 2005, the NRC concluded that the design features of the MOX facility provided sufficient safety provisions based on the commitment to a multi-tiered approach to prevent a "red oil" event.

Chairman Visclosky. Does the Nuclear Regulatory Commission consider this issue resolved?

Secretary Bodman. I defer to the Nuclear Regulatory Commission to answer this question.

Chairman Visclosky. The NRC is allowing the Department to proceed with construction of the MOX plant with certain technical issues still unresolved. Is it possible that the NRC may not be able to issue an operating license to the MOX plant if this "red oil" problem is not resolved to NRC's satisfaction?

Secretary Bodman. I would again defer to the Nuclear Regulatory Commission to answer this question.

Chairman Visclosky. What type of design work will need to happen to accommodate the "red oil" explosion concern?

Secretary Bodman. As I mentioned, the controls incorporated into the MOX facility design include: strict process temperature limits, removal of TBP prior to process heating, assured venting of process vessels to avoid pressure buildup, and limiting acid concentrations to safe levels.

Chairman Visclosky. Please provide for the record a copy of all correspondence between the Department and the NRC regarding this red oil issue. Also provide a copy of all internal DOE memorandum and communications, including e-mails, on this issue.

Secretary Bodman. We will provide this information.

Chairman Visclosky. The Consolidated Appropriations Act of 2008 provides statutory language requiring the Mixed Oxide (MOX) Fuel Fabrication Facility, to "strictly adhere to DOE Order 413.3A." This is the DOE Order that governs the construction of projects. What does DOE Order 413.3A say in regard to projects that are "design build," which is projects that have construction underway while engineering designs are still incomplete?

Secretary Bodman. I am informed that DOE Order 413.3A states that "design-build can be used most successfully with projects that have well-defined requirements, are not complex, and have limited risks. This applies to projects that have few 'unknowns' or new technology requirements, little to no program or system integration, and are not unique or first-of-a-kind. Projects such as road building, administrative facilities, fire stations, and/or replication of previously accomplished projects are generally the most appropriate for design-build consideration."

Chairman Visclosky. To refresh your memory, DOE Order 413.3A states that "design-build can be used most successfully with projects that have well-defined requirements, are not complex, and have limited risks. This applies to projects that have few "unknowns" or new technology requirements, little to no program or system integration, and are not unique or first-of-a-kind." It certainly doesn't sound like the MOX plant meets any of your own requirements for use of the "design-build" approach. Why are you violating your own internal DOE guidance on this project, especially when you are now required by statute to apply DOE Order 413.3A to this project? This sounds like exactly the same mistake you committed in the management of the Waste Treatment Plant at Hanford.

Secretary Bodman. The MOX project is managed consistent with DOE Order 413.3A as evidenced by the Acquisition Executive's approvals of Critical Decision (CD)-2 (Performance Baseline) and CD-3 (Construction Start), which were authorized in April 2007 and August 2007, respectively. Determining which delivery method to use for a construction project, either "Design-Build" or "Build-to-Print," depends on a number of variables (e.g., complexity, unknowns, technology requirements, etc.). Due to the complexity and advanced technology requirements of the MOX facility, virtually all process system and equipment design and fabrication contracts, as well as facility construction contracts are being managed as a build-to-print and not design-build. Certain and very limited portions of the MOX project, such as the grading and installation of roads and parking lots, as well as the design and construction of the administration building and warehouses, are being managed as design-build because they have well defined requirements and less complexity.

Chairman Visclosky. We included language specifically making DOE Order 413.3A apply to the MOX project, in part to address the Department's previous attempts to waive certain 413.3 A requirements with respect to this project. One of those requirements is that the Earned Value Management system used for the MOX project must be certified by the Office of Engineering and Construction Management. Has that certification happened yet, and if not, when will the EVMS for the MOX project actually be certified?

Secretary Bodman. The MOX facility Earned Value Management System (EVMS) was established in 2006. While DOE's Office of Engineering and Construction Management has completed extensive reviews of the MOX facility's EVMS and continues to monitor the EVMS regularly, it has not yet received final certification. We expect the final certification to be provided in April 2008.

Chairman Visclosky. When will we have a new baseline for the project cost and schedule? Such a new baseline is required by the explanatory statement accompanying the Consolidated Appropriations Act for FY 2008.

Secretary Bodman. We anticipate having the revised project cost and schedule baseline for the MOX project approved by the DOE Acquisition Executive in the June 2008 timeframe.

Chairman Visclosky. You also have a MOX report due February 15th as required by the Defense Authorization Act. When will that report be delivered to Congress?

Secretary Bodman. The report is in final concurrence within the Department and we expect this report to be delivered to Congress no later than April 31, 2008.

MOX MANAGED BY NNSA VICE NUCLEAR ENERGY

Chairman Visclosky. Congress explicitly transferred the MOX project from NNSA management under the Defense Nuclear Nonproliferation account to Nuclear Energy management under the Nuclear Energy account. We have been informed that this management shift has not occurred, and that all of the former NNSA staff continue to manage this project under an Economy Act agreement with Nuclear Energy. Please explain why the project management staff for this project does not report directly for Assistant Secretary Spurgeon. When will this situation be corrected?

Secretary Bodman. As I explained in my response to the first question, the transfer directed by the committee report accompanying the Consolidated Appropriations Act, 2008, is not law according to Supreme Court guidance, and therefore did not itself transfer the MOX program that had been previously placed in NNSA by law. The NNSA Act also removed from the Secretary the authority to transfer programs out of the NNSA, so the Secretary could not act to carry out the direction contained in the committee report.

Chairman Visclosky. You also chose to request FY 2009 funding for the MOX project under the Other Defense Activities account, when this Committee explicitly directed that this project be treated as a non-defense project under Nuclear Energy. Please explain your rationale for seeking defense funding for this project in FY 2009.

Secretary Bodman. The administration considers the MOX project fundamentally a non-proliferation project and therefore properly funded in the Other Defense Activities account, within the portion of that account which funds activities of the Office of Nuclear Energy. The committee report for the Consolidated Appropriations Act, 2008, prompted a review of the matter and some hard thought by the administration in formulating the President's 2009 budget. That review resulted in the judgment that the MOX program remains a nonproliferation and national security matter. As a matter of law, the President if entitled to make any recommendation to Congress, including his budget, that the President considers appropriate. The Congress, of course, is under no obligation to act in conformity with the President's judgment reflected in his recommendation.

NATIONAL NUCLEAR SECURITY ADMINISTRATION (NNSA) COMPLEX TRANSFORMATION

Chairman Visclosky. Let's talk about your big ticket items: 2-axis DAHRT, NIF, MESA, and Z. What is the unique contribution of each, when do you expect to begin operations, and how much funding is needed for completion? For each of these programs, please provide the following information:

- Date of initial construction
- Completion date anticipated at time construction began
- Presently projected completion date

- Reason for schedule slippage, if any
- Life cycle cost projection at time of initial construction in FY 2008 dollars
- Current life cycle cost projection in FY 2008 dollars
- Reason for cost changes
- Projected date of project shutdown
- Reason for shutdown

Secretary Bodman. When the 2nd Axis Refurbishment Project is completed, the two axes (full DARHT facility) will provide time-resolved three-dimensional radiographs of mock-ups of nuclear weapon primaries. This is performed by producing x-rays with a pair of electron beam accelerators set at right angles to one another. The DARHT facility is the most advanced linear accelerator system in the world; some of the components used for the 2nd axis are so unique and advanced that they are under an "export control" regime. The two-axis multi-time radiographic hydrotesting capability in DARHT is needed for weapons certification both as a whole and for individual weapons systems. It is a key technique to reduce risks and uncertainties in the understanding of the performance of weapons systems in the nuclear weapon stockpile in the absence of underground testing.

The first axis of DARHT has been operating since 1999. The DARHT 2nd Axis refurbishment is nearing completion and to date has met all approved baseline milestones and deliverables. DARHT 2nd Axis is expected to be operational by the end of FY 2008 after the two units undergo a readiness assessment to ensure people, procedures, and systems are ready to safely operate both axes. The DARHT 2nd Axis Refurbishment and Commissioning Project was authorized by Congress in FY 2004. It has received all its planned funding; the last allotment was received in FY 2008 in the amount of $4.505 million. The line item construction project; 97-D-102, DARHT, was initiated in 1997. The completion date anticipated at time construction was the fourth quarter of FY 2002. The DARHT 2nd Axis under the line item (97-D-102) was completed on time; however, upon operation of the 2nd Axis, high-voltage breakdown in some accelerator cells was observed that required redesign of the cells. As a result, in FY 2004, the current expense funded project was initiated (with Congressional approval) to redesign 74 cells. This FY 2004 initiated, expense funded project is scheduled to become operational at the end of FY 2008. The FY 2004 initiated expense funded project is on schedule to become operational at the end of FY 2008.

The life-cycle cost projection at the time of initial construction was estimated at $711 million, which was comprised of $552 million in operations and maintenance cost over 30 years; and $159 million of Total Project Cost for the line item 97-D-102 for the 2nd Axis. The current life cycle cost projection is estimated at $800 million; which is comprised of $552 million of operations and maintenance cost; $159 million from the initial line item; and $89 million for the refurbishment and redesign of 74 cells. The initial line item scope was completed within the approved budget and so will the refurbishment and the redesign of the 74 cells. The refurbishment and the redesign of the 74 cells became necessary after the 2nd axis became operational and exhibited high voltage breakdowns. The redesign and refurbishment approved baseline cost is $89.8 million. As part of Complex Transformation we are considering the shutdown of DARHT in 2025. One of the transformational alternatives we are considering would consolidate these types of testing facilities at the Nevada Test Site.

The National Ignition Facility will provide the only access to thermonuclear burn conditions for the U.S. nuclear weapons program in the absence of underground nuclear testing. Experiments in this regime are vital to maintaining the U.S. nuclear weapons stockpile. In particular, NIF is uniquely suited to provide access to the physical phenomena of ignition and thermonuclear burn which is at the heart of nuclear explosions and the most important remaining question in weapons physics. Early experiments utilizing a portion of the laser system have already begun. Important data relevant to weapons issues have been obtained in these experiments. Operation of NIF at full capability is projected for second quarter FY 2009.

Funding of $57 million is required for the completion of the NIF Project in FY 2009. The line item construction project began in FY 1996. The original completion date for the NIF Project was the third quarter of FY 2002. There are two reasons for the schedule slippage. The first occurred during Title I design review of the NIF Project when additional functional and technical capabilities, (such as not to preclude direct drive, addition of a second target chamber, and other technical enhancements) were added to the design. The second reason resulted from underestimation of the original project contingency and the complexity of the beam path infrastructure design that necessitated the assembly and installation of the laser system in an ultra-clean environment. These changes plus the internal program-driven direction to limit the annual funding to no more than $150 million annually caused the NIF Project to be extended for an additional four years to the fourth quarter of FY 2008. In FY 2005, the NIF Project received a directed change from Congress that decreased the funding available during FY 2005. This FY 2005 change added an additional $54 million and six months to the completion date.

Assuming a 30-year life, the projected life-cycle cost was about $5.7 billion (in FY 2008 dollars). The current life cycle costs are projected to be $7.8 billion (in FY 2008 dollars). The main reason for the cost changes is construction costs of the NIF Project. No changes to the life-cycle costs are attributed to the operations of the NIF in the projected 30-year operating period. The NIF Laser System is intended as a long term national capability. There is no plan for shutdown. There is no plan for shutdown.

The Microsystems and Engineering Sciences Applications MESA will be the premier NNSA national facility for microelectronics technology. MESA will:

- Provide new capability to support radiation-hardened integrated circuit production and qualification;
- Conduct research and development, rapid prototyping, pre-production fabrication and analysis, and a war reserve microelectronics production capability "of last resort" for the National Nuclear Security Administration's nuclear weapons complex, and other national security customers; and
- Develop and use computational tools and capabilities (including visualization and design labs) to support microelectronics design, simulation, and manufacturing; weapons performance assessments; renewal process analyses; and qualification of microelectronics components, integrated subsystems, and the certification of the overall weapon system.

The MESA is a combination of renovated existing clean-room space, retooling of that existing space, and three new facilities. Operations at the separate facilities have been phased-in during project execution as described in the table below. The MESA new facilities laboratory and office space totaling 398,300 square feet for 648 people and includes:

- Microsystems Fabrication (MicroFab) Facility – 89,100 square feet clean-room;
- Microsystems Fabrication Tooling – approximately 255 items including 112 tools, 108 pieces of tool support equipment, and 35 tool relocations;
- Microsystems Laboratory (MicroLab)– 130,000 square feet for 274 personnel;
- Weapons Integration Facility (WIF) – 167,200 square feet for 274 classified and 100 unclassified personnel; and
- Two Central Utility Buildings – 12,000 square feet.

Project Milestones

| Activity | Baseline Date | Actual Date |
|---|---|---|
| Performance Baseline Approved By Secretary of Energy | 3Q FY 2002 | October 2002 |
| Start of Construction Approved | 3Q FY 2003 | May 2003 |
| Start MicroFab Occupancy | 2QFY 2007 | April 2006 |
| MicroFab Tools installation Complete | 2Q FY 2007 | April 2007 |
| Start MicroLab Occupancy | 2Q FY 2008 | April 2006 |
| MicroFab Critical Decision 4 (Start Operations) | 3Q FY 2007 | June 2007 |
| MicroLab Critical Decision 4 (Start Operations) | 3Q FY 2007 | May 2007 |
| Start WIF Occupancy | 3Q FY 2011 | August 2007 |
| WIF Critical Decision 4 | 3Q FY 2011 | 3Q FY 2008 (planned) |

The Overall project will be completed no later than September 30, 2008, as reported in the President's FY 2008 budget to Congress.

The MESA has received all of its necessary funds; the last allotment of $10.984 million was received in FY 2008. The date of initial construction was May 2003 (MicroFab). The completion date anticipated at the time construction began was the third quarter of 2010. The present projected completion date is September 30, 2008. There is no reason for schedule slippage; the project will be completed 3 years ahead of the approved baseline date due to additional funding added by Congress above the budget request. The life-cycle cost projection at time of initial construction was $656 million for 30 years; which is comprised of $518 million for design and construction and $138 million for operations and maintenance costs. The current life-cycle cost projection is $654 million; which is comprised of $516 million in total project costs and $138 million for operations and maintenance costs. The project is expected to have

approximately $40 million cost under-run due to an accelerated funding profile provided by Congress. There are no plans for shutdown.

The Z facility at Sandia National Laboratories provides an important and unique capability for experiments in the areas of weapons materials, weapons effects, and radiation physics. These experiments provide important information for the continuing assessment of the stockpile. Operations at the refurbished (upgraded) Z facility have already begun. Preliminary weapons materials data has been produced. The project is complete and no further funding for construction is required. The project began in the second quarter of 2002 with initiation of design work; fabrication of components began in the third quarter of 2004. The completion date anticipated at the time construction began was the first quarter of 2007. The project experienced some delays in procurement due to external factors including bankruptcy of a key supplier. To minimize delays, and to meet programmatic needs, NNSA and Sandia extended operation of the Z facility so that more shots could be taken before the Z facility was shutdown for refurbishment. In particular, the Z facility conducted important experiments on the properties of plutonium before shutdown.

The estimated total project cost was $90.4 million with an annual operating cost of $40 million in FY 2008 dollars. For a 20-year life, the life cycle cost would be $890.4 million. There are no estimates for decommissioning and disposal. The current life-cycle costs are projected to be about $200,000 above the original projections. The cost changes are due to problems with sub-contractors including bankruptcy of a key supplier. The Z Machine is intended as a long-term national capability, but a reasonable estimate of life cycle is about 20 years.

Chairman Visclosky. In December 2007, the DOE's National Nuclear Security Administration (NNSA) issued its draft Supplemental Environmental Impact Statement (SEIS) on transforming the nation's nuclear weapons complex. A final decision has been promised for the end of FY 2008. Last year you came before us with a plan for Complex 2030. Now that appears to be dead. What has replaced it and why? What date is your plan targeting and what is the plan?

Secretary Bodman. Our plan, referred to as Complex Transformation, is to achieve a smaller, safer, more secure and less expensive nuclear weapons complex that leverages the scientific and technical capabilities of our workforce and that meets national security requirements. The earlier Complex 2030 plan was handicapped by the assumption by many that it was dependent on the Reliable Replacement Warhead (RRW) and that most actions took place 25 years in the future. Complex Transformation maintains the same vision and strategy but is firmly based on actions that we can take over the next 10 years and changes that we must make to the Complex independent of whether we pursue a long-term life-extension or an RRW strategy. Most Complex Transformation actions would be completed by 2018. The comprehensive plan is based on four pillars: (1) transform the nuclear stockpile; (2) transform the physical infrastructure through consolidation, modernization and reduction in footprint; (3) create a more integrated, interdependent enterprise through more effective and less costly business practices; and (4) advance the science base that is the foundation of our nuclear deterrent capability.

Chairman Visclosky. This Subcommittee has asked the Department and DOD to develop a strategy and a complex transformation plan. It's not enough to say you're going to have so many W87s, so many B61-11s, and so forth. That's too superficial. Mr. Secretary, you need to know precisely the purpose for which you need each type of warhead and you need to share that knowledge with us. Otherwise, you're not convincing us it exists. What is the status of that effort?

Secretary Bodman. In July 2007 the administration provided Congress the white paper "National Security and Nuclear Weapons: Maintaining Deterrence in the 21st Century." This paper provided a broad rationale for U.S. deterrence policy. A second, detailed and classified, white paper is forthcoming that will provide additional deterrence justification as well as the reasons underpinning current and future force levels. It should be noted, however, that targeting requirements and their associated required weapons characteristics remain the responsibility of the Department of Defense and specifically the U.S. Strategic Command and not the Department of Energy.

Chairman Visclosky. I don't mean to be patronizing, but it seems obvious that the sequence is this: Step 1 is the strategy to decide what we need our nuclear force to do; Step 2 is the acquisition to decide on how many weapons with what characteristics we need to do that; and Step 3 is the support to figure out what complex we need to support those weapons. Can you please explain how a decision on transforming the complex can be made when there is still no national policy on what our strategic nuclear weapons posture should be? How can you do Step 3 without a Step 1 strategy?

Secretary Bodman. Today the nuclear weapons complex is at a crossroads and faces challenges not seen since its inception. Maintaining the deterrent means adequately maintaining the nuclear weapons complex. The status quo is not an option. Delay and inaction will only increase the costs and elevate the risks associated with maintaining an aging stockpile. We must transform the complex to a smaller, but interconnected enterprise that accomplishes our existing and future national security missions.

To address the challenges facing our aging complex, we propose to transform a large, costly and inefficient Cold War nuclear weapons complex into a 21st Century integrated, modern and cost effective National Security Enterprise that is at the forefront of science and technology and responsive to future national security requirements. Complex transformation is more than just transforming an aging physical infrastructure. It seeks to transform our contracting, procurement and management of the enterprise to embrace the best in 21st Century business and human capital practices. Complex transformation also seeks to leverage our core competency in nuclear weapons design and maintenance to advance our leadership in counterterrorism, nonproliferation, physical security, cyber security and support of the intelligence community.

Chairman Visclosky. For FY 2008, Congress denied all funding for the Reliable Replacement Warhead (RRW) on the grounds that a new warhead is premature without an underlying strategy. Please identify all funding in your 2009 request that specifically applies to RRW.

Secretary Bodman. Funding that specifically applies to RRW is located within Directed Stockpile Work (DSW). Ten million dollars is requested to enable maturation of the RRW design and to address the issues raised by the JASON review. The work on certification and tools relevant to legacy and future systems, but that does not specifically advance the RRW Phase 2A design study, is located within the Science Campaign and the Engineering Campaign.

Chairman Visclosky. If there is more than one line item for addressing issues raised by the JASON review, where are these items and how much are they?

Secretary Bodman. The broader issues of certification raised by the JASON RRW review will be addressed in the Advanced Certification activity of the Science Campaign, as directed by the Congress in the FY 2008 appropriations. In order to adequately address these issues for RRW, work to mature the specific RRW design is proposed to be accomplished within DSW.

Chairman Visclosky. Presuming you satisfy the requirements we set out for a nuclear weapons strategy, you would have a choice: On the one hand, you could place primary reliance on maintaining the tightest possible pedigree of commonality with tested components; or on the other hand, you could sacrifice pedigree for enlarging the margin. Under which strategy would you be most comfortable with an ironclad commitment not to test?

Secretary Bodman. Science-based stockpile stewardship recognizes that it is impossible to maintain confidence in systems as complex as nuclear weapons by simply keeping components "the same." NNSA has long emphasized both understanding the changes that take place in the stockpile as the unavoidable effects of aging and component replacement, as well as understanding how these changes may affect reliability and performance. Increased margin can make a system easier to manufacture and maintain, but does not by itself improve reliability or simplify certification. Regardless of the mix of legacy, Life Extension Programs (LEP), or RRW warheads in the stockpile, we are committed to continued certification without the need for testing; recognizing that each inevitable small change we make from the "as-originally-certified" design through an LEP makes certification more difficult. Significant enhancements in our predictive understanding of nuclear weapons are required to ensure certification without testing.

Chairman Visclosky. The draft SEIS calls for the construction of several large expensive facilities at various NNSA sites across the country. However, outside organizations, such as the GAO, continue to report on difficulties NNSA and DOE have with managing projects within cost, scope, and schedule. What specific actions are you taking to improve project management at NNSA and the Department to ensure that these projects will be completed on time and within budget?

Secretary Bodman. Although NNSA has delivered several construction projects on time and budget, I understand that the Department has a mixed history of managing its projects. NNSA is undertaking near-term program changes to improve its management of construction projects. The corrective actions will help NNSA execute the projects it decides to implement after it completes the SPEIS.

To address long-standing project management difficulties within DOE, the Deputy Secretary inaugurated a far reaching "Root Cause Analysis" effort to address the issues that contributed to project management difficulties in the past. This analysis was completed in fall 2007 and a DOE-wide Corrective Action Plan is being implemented to address these root causes.

Within NNSA, the Administrator established a resourced management team to focus on improving project performance in the agency. A blueprint for improving project management containing six specific actions was developed and all actions are underway with completion planned for CY 2008. The actions feature initiatives that will: properly resource our projects with qualified personnel; implement an effective requirements definition process; improve our cost estimating capability; improve our acquisition planning/contracting ability; improve our ability to identify and manage project risks; and clarify roles, responsibilities, authorities, and accountability in project management. Significant progress has been made on the blueprint with many major tasks nearing completion. These specific actions will implement best practices throughout the complex and thereby significantly improve our project management performance.

Chairman Visclosky. Are there any NNSA sites proposed to be closed?

Secretary Bodman. While the Draft SPEIS evaluates a range of alternatives that would result in the closing of several NNSA sites, our preferred alternative is to continue to use NNSA's eight major sites. However, these sites would be very different from today under the preferred alternative. We propose to consolidate Category I/II special nuclear materials (SNM) at five sites (from seven today) by the end of 2012, with a smaller security footprint within those sites by 2018. We propose to close or transfer from weapons activities more than nine million square feet of buildings and structures by 2018. Finally, we propose to cease NNSA operation of two large test sites (Site 300 at Lawrence Livermore National Laboratory and the Tonopah Test Range in Nevada).

Chairman Visclosky. Your draft SEIS contains many interesting proposals to consolidate uranium and plutonium processing in different configurations. The Consolidated Nuclear Processing Center idea, for instance, would have all of these materials in one place, where they can be more easily guarded and where they would pose a much smaller risk to the environment and the public. We need more thinking like this. Unfortunately, NNSA has chosen as its "preferred alternative" a much different approach. If anything, this preferred status-quo plan seems to meet political pressure more than it helps to make our nuclear complex safer and more efficient. What was the rationale for choosing this as NNSA's "preferred alternative?"

Secretary Bodman. Our preferred alternative for restructuring our special nuclear material (SNM) facilities is based on mission risk, environmental impacts, security costs, and budget considerations. The preferred alternative of distributed centers of excellence would not maintain the status-quo. While NNSA would continue operations at its eight major sites, each site would be very different. As to potential environmental impacts, our Draft Supplemental Programmatic Environmental Impact Statement (SPEIS) shows that the preferred alternative would have lower land-use and socioeconomic impacts than alternatives that include a Consolidated Nuclear Production Center (CNPC). We have also completed business case analyses of the alternatives analyzed in the SPEIS using organizations inside and outside NNSA. (The business cases

analyses and other analyses of the cost and risk of transformation alternatives are available for public review on our web page: http://complextransformationspeis.com.) A particularly notable comparison of our preferred alternative and alternatives with a CNPC was completed by the Department of Defense Cost Analysis Improvement Group (DoD-CAIG). The DoD-CAIG concluded that "establishment of a consolidated nuclear production center would be less cost-effective than modernizing existing nuclear weapons production facilities." (Office of Secretary of Defense (OSD) Cost Analysis Improvement Group (CAIG) Independent Assessment of the National Nuclear Security Administration's (NNSA) Proposed Nuclear Weapons Complex Modernization Program; January 10, 2008, Memorandum to Deputy Associate Director for National Security, OMB, and Administrator, NNSA.)

NNSA INITIATIVES FOR PROLIFERATION PREVENTION

Chairman Visclosky. In a December 2007 report, GAO raised serious concerns about the management and direction of the NNSA's Initiatives for Proliferation Prevention (IPP) program, which was begun in 1994 to engage former Soviet weapons scientists in nonmilitary work in the short term and create private sector jobs for these scientists in the long term. These concerns included excessive carryover balances, overstated accomplishments, and the lack of an exit strategy for the program. Additional work by GAO at the request of the House Energy and Commerce Committee in January found that two Russian institutes receiving IPP funds were also working on nuclear projects in Iran, including the Buhsehr reactor. Is the DOE's policy of funding the same Russian Institutes that support nuclear projects in Iran consistent with the policy adopted by other federal agencies, such as the State Department? I am advised that the State Department does not fund Russian institutes if they are doing work in a country of proliferation concern? Why doesn't DOE have the same policy?

Secretary Bodman. It is the policy of both the State and Energy Departments not to fund projects that involve institutes doing work that contributes to the weapons program of a country of proliferation concern. To ensure consistency with U.S. nonproliferation policy and regulations, the Departments of Energy and State use similar procedures for review of scientist engagement project proposals. This includes review by U.S. Government agencies to determine whether project participants are subject to U.S. sanctions or are known to support programs of proliferation concern. Project proposals are also subject to review by relevant U.S. export control committees in cases where a U.S. license or authorization may be required. To strengthen the current review process, the Departments of Energy and State, in coordination with other U.S. agencies, have agreed to assess and update project review procedures and criteria to ensure consistency across U.S. scientist engagement programs.

Chairman Visclosky. Is DOE reconsidering its policy of funding Russian Institutes which are doing work on the Buhsehr reactor?

Secretary Bodman. The Department does not have a policy of funding projects at Russian institutes doing work on Bushehr. Rather, each project proposal is reviewed to ensure consistency with U.S. nonproliferation policy and regulations, including whether the project involves individuals or organizations subject to U.S. sanctions or whether those individuals or organizations are known to support programs of proliferation concern. The fact of a Russian

institute's support to Bushehr has not been a determinative factor in these reviews. However, as noted above, the Departments of Energy and State, in coordination with other U.S. agencies, have agreed to assess and update project review procedures and criteria to ensure consistency across U.S. scientist engagement programs.

Chairman Visclosky. To what extent can DOE guarantee that every Russian/FSU scientist involved in an IPP project who claimed to have WMD experience actually possesses such a background? In other words, how does DOE verify that all the participants on an IPP project are who they claim to be?

Secretary Bodman. The Department uses a number of mechanisms to verify the WMD backgrounds of foreign participants, including the informed judgments by U.S. scientific experts; assessments of open source reporting (e.g., publications); and declarations of each foreign participant as certified by the associated institute and foreign government ministry. The GAO in its recent audit recommended that the Department improve its documentation procedures, a recommendation that the Department has agreed to implement.

Chairman Visclosky. GAO recommended that DOE seek cost-sharing from Russia for future IPP projects in that country, particularly in light of Russia's increased prosperity. However, DOE took no position and did not comment on this recommendation in its official agency comments on GAO's report. Why did the department not take a position on this recommendation? Will DOE seek cost-sharing on future IPP projects in Russia as GAO recommended?

Secretary Bodman. The Department agrees with the GAO recommendation, and will seek to introduce cost-sharing with Russia for new projects and, to the extent practicable, existing projects. The Department inadvertently omitted a response to this GAO recommendation.

Chairman Visclosky. When do you believe that U.S. assistance to Russia and other former Soviet states through the IPP program should end? If you are opposed to a draw-down and development of an "exit strategy" for the IPP program, please explain why.

Secretary Bodman. The Department supports a drawdown or exit strategy, and agreed with the GAO recommendation on this point. Further, it should be noted that such a drawdown is already in progress in terms of reduced budget and program scope. This includes cancellation of the Nuclear Cities Initiative in 2006 and a reduction of the program budget from $57 million in fiscal year 2002 to about $20 million requested in FY 2008. Allocations for projects in Russia have also been greatly reduced. In addition, the Department has completed the first phase of an institute assessment to target funds more precisely on institutes that have not enjoyed the benefits of Russia's economic recovery and therefore remain a priority for engagement.

Chairman Visclosky. Recognizing that there is no formal U.S.-Russian agreement for nuclear cooperation, what steps has DOE taken to ensure that any cooperation and assistance provided to IPP projects in Russia to advance the Global Nuclear Energy Partnership are compliant with the terms and requirements of the Atomic Energy Act?

Secretary Bodman. Projects approved by the Department of Energy that involve Russia and aspects of the Global Nuclear Energy Partnership are among those identified in the U.S.-Russia Civil Nuclear Energy Working Group Bilateral Action Plan as having potential for near-term collaboration. The Action Plan notes further that such projects should be consistent with "existing legal and regulatory frameworks," which includes the Atomic Energy Act of 1954, as amended. To ensure consistency with U.S. laws and regulations, projects referenced in the question were structured so that the technology flow is from Russia to the United States.

SAFETY ISSUES AT THE HANFORD CLEAN-UP SITE

Chairman Visclosky. Mr. Secretary, Hanford, like other DOE sites, has experienced safety incidents. For example, a 2004 investigation found that workers at Hanford had been exposed to radioactive vapors from underground waste storage tanks. In July 2007, more than 80 gallons of radioactive and hazardous waste spilled onto the ground as it was being pumped between underground tanks at the Hanford site. Up to 12 workers later reported health problems from their exposure to the spilled waste. In addition, work emptying the tanks ceased for more than 6 months. What steps, if any, has DOE taken to improve safety performance at the Hanford site?

Secretary Bodman. The protection of our workers, the public, and the environment are paramount to the Department's cleanup mission at Hanford. When incidents do occur, the Department takes immediate action to protect human health and the environment, undertakes in-depth analyses to understand the root causes, and develop corrective actions.

The Department is using a number of tools to keep workers safe and improve safety performance at sites such as Hanford. Integrated Safety Management is the basis of our safety programs across the Department's sites. It involves the integration of safety awareness and practices into all aspects of work performance. Integrated Safety Management provides a formal process where workers plan, perform, assess, and improve the safe conduct of work, down to each and every task.

Recently, as part of our ongoing effort to continuously improve safety performance, Hanford senior management implemented a Human Performance Initiative (HPI) pilot that included DOE and its prime contractors. HPI is a tool that has been very successful in reducing the occurrence of events in the commercial power industry. Results of the pilot indicate that the effort and resources expended to implement HPI tools are worthwhile, improve operational performance, and improve Integrated Safety Management implementation.

Oversight of the contractor's operations has been enhanced through the selective hiring of technical expertise in individual critical areas of nuclear operations called Safety System Oversight experts (SSOs), increased numbers of Facility Representatives that perform daily safety oversight in the field and an increase in radiological conduct of operations personnel that view how the contractor's performance meets verbatim compliance with their Radiological Protection Program. Combined, the process of Integrated Safety Management, changing human performance through the Human Performance Initiative and increased oversight expertise is leading to an improved safe work environment at the Hanford Site.

SALES OF DOE URANIUM INVENTORIES

Chairman Visclosky. DOE currently maintains large inventories of natural, enriched, and depleted uranium that are potentially commercially valuable. Proposed legislation and several commercial proposals are pending to allow the department to introduce this material into the commercial uranium market. Does DOE have any current or pending plans to sell or otherwise market these uranium inventories?

Secretary Bodman. During the coming year, DOE will continue its ongoing program for down-blending excess highly enriched uranium (HEU) into low enriched uranium. The HEU program depends on the ability to pay for commercial down-blending services by transferring title to a portion of the resulting low-enriched uranium to the contractors, which introduces DOE material into the commercial uranium market. This type of "barter" transaction is currently under review within the Administration. Also, DOE will evaluate the benefits of enriching a portion of its excess natural uranium into low enriched uranium and complete an analysis on enriching and/or selling some of its excess depleted uranium.

Chairman Visclosky. Does the department favor depositing the proceeds of these sales, if any, into the Uranium Decontamination and Decommissioning (D&D) Fund to make up identified gaps in the funding required for D&D of the Portsmouth and Paducah Gaseous Diffusion Plants?

Secretary Bodman. The Administration has not developed a position on the use of proceeds from the sales of the Department's excess uranium. Under current law, any proceeds from such sales would be deposited in the U.S. Treasury as required by the Miscellaneous Receipts Act.

SCIENCE

Chairman Visclosky. Mr. Secretary, the decision that was made as part of the FY 2008 Omnibus Appropriations Bill regarding ITER has caused a series of concerns and impacts. Specifically, what is the agreement between the U.S. Government and its international partners regarding ITER and any funding decisions?

Secretary Bodman. The ITER is a seven-member international collaboration to design, build, and operate a first-of-a-kind research facility in Cadarache, France to demonstrate the scientific and technological feasibility of fusion energy for peaceful purposes, an essential feature of which would be achieving sustained fusion power generation. In that regard, the United States signed an international agreement in November 2006 that commits the ITER Members to providing funding support, staff, and in-kind hardware components to the ITER Organization (an independent legal entity) for construction, and then funding support for its operation phase. The other six ITER Members are the European Union (the host), China, India, Japan, South Korea, and Russia.

For the Construction Phase, the ITER Joint Implementing Agreement stipulates that each of the six non-hosts shall provide an overall contribution (in-kind and in-cash) equal to a 1/11 share

(9.1 percent) of the total ITER scope. The corresponding host share for the European Union is 5/11 (45.4 percent).

Withdrawal from the ITER Joint Implementing Agreement is not permitted until ten years after entry into force of the Agreement, which would be in 2017. The 10 years is the nominal period for ITER construction that is identified in the Agreement. If the United States were to elect to withdraw before that point, the United States would nonetheless be committed to supply its negotiated share of construction costs, if such funding had not already been provided by that point. This commitment is estimated to be about three quarters of a billion dollars in today's dollars.

Chairman Visclosky. Mr. Secretary, as part of your budget request, the Office of Science proposed a competition to fund several Energy Frontier Centers in the Office of Basic Energy Sciences to "to accelerate scientific breakthroughs needed to create advanced energy technologies for the 21st century." Could you describe this proposal in greater detail?

Secretary Bodman. The Energy Frontier Research Centers (EFRCs) are a means to attract the very best American scientists and engineers to address current fundamental scientific roadblocks to U.S. energy security. The EFRCs will address energy and science "grand challenges" in a broad range of research areas; these "grand challenges" have been defined through a series of more than one dozen technical workshops conducted over the past five years. For example, the Centers may address bottlenecks in cellulosic biofuel production in new and exciting ways. .We do not yet have a complete, molecular level understanding of the structure and composition of the complex structure of cellulose and lignin, materials that we would like to turn into portable fuels. Imagine if, armed with that information, we could devise catalytic methods to convert these materials into the portable hydrocarbons (gasoline, diesel) that fuel our existing transportation infrastructure. In solar energy research, learning to direct and control materials and chemical processes at the level of electrons—where the laws of quantum mechanics rule—could lead to two remarkable advances. It may be possible to create solar photovoltaics that greatly exceed current efficiency limits using abundant, cheap materials. Or, imagine the direct conversion of sunlight into chemical fuels by mimicking nature's remarkable photosynthetic machinery. The direct use of sunlight to produce fuels from water or carbon dioxide at reasonable efficiency would be a staggering development. It is this sort of transformative science that we seek from the EFRCs.

The EFRC proposals will be solicited through a Funding Opportunity Announcement (FOA). This will provide an open competition among all researchers for the very best ideas to address the fundamental questions of how nature works and to help solve some of our most critical real-world challenges. The selection of the initial 20 to 30 awards in FY 2009 will depend on the quality of the proposals received and the peer review outcomes of the FOA competition. While the EFRCs are not anticipated to contribute immediately to commercialization of energy technologies, they will address key scientific issues ("grand challenges") that limit transformational advances needed for future energy technologies.

Chairman Visclosky. The proposal calls for funding these centers at $100 million per year from the budget of the Office of Basic Energy Sciences – how will this request impact other research and facilities supported by the office?

Secretary Bodman. The Energy Frontier Research Centers will be initiated with a portion of the requested funding increase for Basic Energy Sciences in FY 2009. The creation of the EFRCs will expand and complement the research and facilities supported by BES. After the $100 million is awarded, the funding for the EFRCs will represent about 15 percent of the total funding for research in the BES program. The EFRCs will bring together the skills and talents of multiple investigators to enable research of a scope and complexity that is not achievable with standard individual investigator or small group awards. The EFRCs are also encouraged to use and leverage existing facilities, including the major Office of Science user facilities. They will engage researchers primarily at universities—and at laboratories and industry as appropriate—in a competitive process to address U.S. energy security through basic and "use inspired" research.

Chairman Visclosky. The committee strongly endorses the open, competitive model being proposed for these centers, which will feature groups from national labs, universities, and other private entities competing head-to-head to ensure that the best proposals will be funded regardless of the affiliation of the researchers involved. Why is such a model not more broadly employed by programs across the department?

Secretary Bodman. The Office of Science's upcoming competition for the initial Energy Frontier Centers was patterned after a similar competition for funding basic research conducted by the Office of Science last year to establish three BioEnergy Research Centers. Program and acquisition officials decide on a case-by-case basis what process and structure is best for their unique activity based on a number of factors including: the requirement, the acquisition strategy, competition level, and technical considerations. Head-to-head competition with the private sector by DOE's Federally Funding Research and Development Centers (FFRDCs) in many cases is not permitted by regulation (see Federal Acquisition Regulation ((FAR) 35.017-1). The Department will explore this model for its potential use in meeting other mission requirements.

Chairman Visclosky. As some of the topics are closely related to technology R&D areas pursued by the energy technology programs (such as solar energy utilization and geosciences for carbon dioxide storage), why has this effort not been coordinated with the energy technology programs?

Secretary Bodman. The Energy Frontier Research Centers grew directly out of the improved coordination between Office of Science research activities and the DOE energy technology programs over the past 5 years. The EFRC program was formulated based on the series of Basic Research Needs workshops that were organized and run by the Office of Science in cooperation with DOE energy technology programs. The Department is committed to continuing and improving coordination between our basic and applied energy research programs.

Chairman Visclosky. Is this an admission that efforts to truly integrate research and development across the department have come up short?

Secretary Bodman. No, I view the situation as the opposite—there continues to be strong integration of the research and development (R&D) activities within the Department. The intrinsic dissimilarity of research objectives—that the expansive goals of basic research are to understand the fundamentals of phenomena in general, whereas the focused goals of applied research and development are to gain and apply knowledge to achieve specific requirements—represents the primary challenge of meaningfully integrating R&D within DOE. The Department takes this challenge very seriously by establishing a number of strong, continual coordination activities between Science and other DOE program offices in such areas as energy production, conversion, storage, utilization, and transmission, and waste mitigation. For example, six specific topical areas are highlighted in the Department's FY 2009 budget request for enhanced R&D coordination: advanced mathematics for optimization of complex systems, control theory and risk assessment; electrical energy storage; carbon dioxide capture and storage; characterization of radioactive waste; predicting high level waste system performance over extreme time horizons; and high energy density laboratory plasmas. For example, for electrical energy storage, an R&D coordination plan has been jointly developed by the Office of Science, Office of Electricity Delivery and Energy Reliability, and Office of Energy Efficiency and Renewable Energy. The plan outlines the research areas for the coordinated R&D activities, with each office setting aside specific funding in the FY 2009 request for a formally coordinated program in electrical energy storage.

The Department's R&D integration activities also recognize the proper roles of science programs and technology programs. Science can search for and respond to high-risk, game-changing scientific developments that create new technology platforms. Science also seeks solutions to the longer-term scientific issues that challenge multiple technology platforms (e.g., materials in extreme environments, basic biological processes in plants and microbes that form the basis of renewable biomass, etc). Technology programs focus on improving the performance and reliability of existing technology platforms towards specific near-to-mid-term goals. By housing science programs and technology programs in a single agency, DOE brings the strengths of both types of programs to bear on solving our nation's energy security challenges.

Chairman Visclosky. It seems that they would be much more effective if they were part of a larger, integrated and focused research, development, and deployment effort across the department – essentially, what has been envisioned for ARPA-E – so why not just create ARPA-E instead?

Secretary Bodman. President Bush signed the America COMPETES Act into law on August 9, 2007. In a statement released after the signing, the White House noted that the COMPETES Act in many ways supports the aims of the President's American Competitiveness Initiative (ACI). However, the President noted that the Administration would not request funding for all authorizations in the Act, including ARPA-E.

However, recognizing the intent of Congress in passing ARPA-E, the I asked the three Under Secretaries and the Chief Financial Officer to review the ARPA-E statute and its directives, and to examine other possible options for implementation, given current funding constraints. We are examining the authorizations in the legislation, and how best to integrate the goals and mission of ARPA-E with the goals and missions of existing programs of the Department, as appropriate.

These efforts are well under way and are addressing the goals set for ARPA-E in the COMPETES Act. These goals are identifying and promoting revolutionary advances in fundamental sciences; translating scientific discoveries and cutting-edge inventions into technological innovations; and accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty. For example, we are reviewing how ARPA-E relates to our already existing commercialization programs such as Small Business Innovation Research (SBIR), and we must see how our current technology transfer activities could best be used to meet of the goals set out for ARPA-E.
On June 29, 2007, the Under Secretary for Science was appointed Technology Transfer Coordinator, in accordance with Energy Policy Act of 2005. The Technology Transfer Policy Board is already working towards simplifying and streamlining technology transfer transactions at DOE facilities that involve further R&D. They are exploring the creation of a limited number of clearly defined partnering transaction vehicles (e.g., CRADAs) that would available for use, as appropriate, at any facility. This should eliminate a significant impediment to partnering by addressing a major partner complaint: confusion caused in dealing with all the different partnering mechanisms at the various DOE facilities.

I recently issued a issued Policy Statement on Technology Transfer at DOE Facilities designed to help guide and strengthen the Department's technology transfer efforts and to heighten awareness of the importance of technology transfer activities throughout DOE. This Policy Statement builds upon the stimulus provided by the technology transfer provisions contained in the Energy Policy Act of 2005 and other recent legislative actions such as the "America COMPETES Act" that seek to improve the transfer of energy technologies from the Department's Facilities to products and applications that address public and private needs.

The Office of Science is also examining the more than $500 million per year spent to provide matching funds with private partners to promote promising energy technologies for commercial purposes. This, combined with reviews of all technology activities across the Department for the purpose of better coordination between the basic and applied programs, will help us meet most of ARPA-E's goals.

The creation of the Energy Frontier Research Centers is the latest manifestation of the Office of Science's commitment to provide innovative basic research to accelerate scientific breakthroughs needed to create advanced energy technologies for the 21st century. The EFRCs will be based on competitive awards of from $2 to 5 million per year for an initial 5-year period. We seek to engage the nation's intellectual and creative talent to tackle the scientific grand challenges associated with determining how nature works, leading the scientific community to direct and control matter at the quantum, atomic, and molecular levels, and harness this new knowledge and capability for some of our most critical real-world challenges. The EFRCs will pursue fundamental basic research in areas such as Solar Energy Utilization; Geosciences for Nuclear Waste and $CO_2$ Storage; Catalysis for Energy; Advanced Nuclear Energy Systems; Electrical Energy Storage; Combustion of 21st Century Transportation Fuels; Solid State Lighting; Hydrogen Production, Storage, and Use; Superconductivity; and, Materials Under Extreme Environments. U.S. universities, DOE laboratories, and other institutions are eligible.

The EFRCs and the Bioenergy Research Centers that preceded them are examples of the Office of Science using the authorities granted to us to create non-traditional, nimble, well-thought out and well-funded basic research institutions. I believe that these and other changes mentioned above that we are implementing within the Department fully address the goals and the spirit of the COMPETES Act as well as the Energy Policy Act of 2005. It would be inappropriate to create a new overlapping bureaucracy that would duplicate existing activities, in an attempt to further integrate or accelerate these activities.

Chairman Visclosky. What will be done to ensure that the results of the research carried will be transferred effectively to domestic industry, leading to high paying, high tech domestic jobs and capacity rather than having them go abroad, as was the case with battery research over the last two decades?

Secretary Bodman. The Office of Science will continue to work with DOE energy technology programs to ensure that knowledge gained in the basic research program will be effectively communicated to applied technology programs for developing technology transfer to domestic industry. There have been many cases exemplifying the success in translating basic research discovery to technology breakthroughs that validate the importance of long-term, broad-based fundamental research in developing competitive, domestic industry based on world-leading technologies. Here is one example in which Office of Science research addressed a critical challenge facing the economically viable production of ethanol from biomass: a lack of bio-organisms that can ferment the multiple types of sugar found in biomass. The Office of Science supported research in the early 1990s on fundamental genetic studies that lead to the creation of bio-organisms that not only fermented a wide range of sugars, but also could tolerate high concentrations of ethanol. In the late 1990's, EERE provided additional support to carry this research toward commercially viable technology. That effort was successful, as these organisms became a cornerstone for a cellulosic ethanol start-up venture, known as Celunol Corporation. In June 2007, Celunol merged with Diversa Corporation, a global leader in enzyme technology, to form Verenium Corporation—now a chief developer of biofuels.

Basic research funded by the Office of Science can serve to transfer knowledge to existing industries; however, Science basic research also helps establish entirely new companies by creating innovative, research-based technologies. For example sustained basic research in ceramic nanomaterials has led to the new lithium phosphate battery technology of A123Systems of Watertown, Massachusetts with much higher power densities over traditional batteries. Within the last 3 years these new batteries have reached the commercial marketplace in power tools produced by North America's largest toolmaker, Black and Decker, and they currently are being implemented in hybrid and plug-in hybrid electric vehicles, amongst other applications. In early August 2007, A123Systems and General Motors (GM) announced the co-development of A123System's nanophosphate battery for use in GM's electric drive E-Flex system. The joint effort is expected to expedite the development of the batteries for both electric plug-in hybrid vehicles and fuel cell-based vehicles. This success not only illustrates a success story in translating basic research discovery into technology breakthroughs, it further validates the critical importance of long-term, broad-based fundamental research in paving the knowledge foundations for the next generation of energy technologies. Technology transfer is best accomplished by people—and SC supports the training of a great number of students and

researchers by funding their experiments and their use of SC major user facilities such as light sources, neutron sources, Nanoscale Science Research Centers, and supercomputers.

The proposed Energy Frontier Research Center program will follow these successful examples to address some of our most critical real-world energy challenges by tapping the imagination, creativity, and knowledge of the scientific community and by pushing the frontiers of science. A sound federal strategy for not losing the results of scientific research and technologies abroad includes keeping researchers and their students in the United States through long-term support for high-quality basic research programs so that the knowledge generated can be transmitted to applied research programs for technology transfer.

Chairman Visclosky. The proposed funding for each of the centers will be quite small – just $2-5 million annually – is this really enough to have a substantial impact?

Secretary Bodman. Typical individual investigator or small group awards in Basic Energy Sciences are $100,000 to $300,000 annually over three years. The EFRC awards are expected to be in the $2 to $5 million range annually for a five-year period. This additional commitment of funds and duration-of-effort will permit an Energy Frontier Research Center to achieve a critical mass of researchers and students with a diverse range of experience, skills, and talents to tackle the toughest science problems for fundamentally understanding and controlling how matter and energy work. The request supports 20 to 30 EFRCs centered primarily at universities across the nation. The Office of Science believes the proposed funding level of $3 to $5 million per year for each EFRC is optimal and will result in transformational changes in the way we solve energy production, conversion, transmission, storage, and waste mitigation challenges. This funding level will allow the assembly of a critical mass of scientists that will be more effective than individual-investigator or small-group research projects, while still allowing the scientific community to define a set of centers that are scientifically broader and more diverse than could be achieved with fewer, but larger awards.

Chairman Visclosky. What is your plan in the out-years for these centers?

Secretary Bodman. The plan for the outyears will depend on the success of the centers. Funding is committed for five years, with reviews at about three years. As the Energy Frontier Research Center program matures, it is anticipated that EFRC competitions will be held every few years and that renewal submissions will be openly competed with new proposals. Out-year funding is subject to satisfactory progress in the research and the availability of funding appropriations.

Chairman Visclosky. High energy physics addresses very basic questions about the nature of the universe – about its birth and the fundamental particles and forces that govern it. It is science at the very frontiers of knowledge and understanding, a very basic science. The tagline used to describe the work of the Office of Science is that it pursues "science with a mission" – how does high energy physics really fit into this mission orientation?

Secretary Bodman. In the pursuit of fundamental research, high energy physics strengthens all of the sciences. The new knowledge gained, technology generated, and work force trained

directly advances Office of Science and DOE missions, and in the long term, this basic research provides the foundations not only for delivering on the DOE science and technology missions, but also for science research supported by other agencies, and benefits for society in general. Examples are numerous, of which I will mention only a few: Without the accelerator technologies originally developed by high energy physics, DOE would not have been able to build the advanced light sources that are the core research tools for biology, chemistry, physics, and materials science today. One of the earliest synchrotron light sources in the world, the Stanford Synchrotron Radiation Lab, was developed in the 1970s as an add-on to a high-energy physics accelerator, and is still used today by scientists funded by BES, BER, and NIH. The 2-mile-long linac at the Stanford Linear Accelerator Center, that was used to discover quarks in the 1960s is being converted to the Linac Coherent Light Source within the BES program as the world's first x-ray free electron laser. Super-conducting radiofrequency accelerator technology, first used in high-energy accelerators, has been applied to nuclear physics at Jefferson Lab, is the core technology underlying the Spallation Neutron Source, and will be utilized in next-generation light sources. The investment in developing industrial capacity to produce a new kind of superconducting wire cable, needed to build the Fermilab Tevatron Collider, had a spectacular and unexpected payoff when this capability was applied to meet the demands of the nascent commercial market for medical MRI devices. Lawrence Livermore National Laboratory has built and is currently testing a neutrino detector, originally developed by high energy physicists, as a demonstration of a new technology that may be a "game-changer" in nuclear non-proliferation. These examples demonstrate that HEP, while interesting its own right as a fundamental pursuit, has provided a long and continuing series of benefits for the broader mission of DOE and for the betterment of society.

Chairman Visclosky. Is DOE really the right home for support of high energy physics – doesn't its very broad mission fit more closely with the mission goals of NSF to broadly advance science? Shouldn't it compete broadly with other basic science priorities there rather than with the urgent, mission oriented programs at DOE?

Secretary Bodman. I believe that DOE is the proper organizational home for support of High Energy Physics. The DOE High Energy Physics program as the federal steward develops and operates complex, forefront user facilities and supports and nurtures the core capabilities, theories, experiments, and simulations at the extreme limits of science that has kept the United States at the forefront of intellectual leadership. This requires the long-term, sustained support of a mission-oriented organization. On one hand, HEP capabilities and developments benefit DOE missions, particularly in accelerator technologies, have been used throughout the DOE laboratory complex. On the other hand, DOE has the engineering and project management capabilities which HEP utilizes in the development, construction, and operation of its large facilities and instrumentation. The Office of Science, in general, and High Energy Physics in particular, works with National Science Foundation and other agencies, as well with the international scientific community to coordinate and optimize the use of resources to deliver outstanding advancements in science as well as new technologies that benefit all of science and engineering. Given the success of these collaborations, we do not find it compelling, or cost effective, to consider reinventing elements of other agencies to replicate the engineering, facilities operations and project management capabilities of DOE.

Chairman Visclosky. In fact, as many recent reports have indicated, the U.S. has been losing its world leading position in high energy physics – has DOE truly been an effective steward of this field?

Secretary Bodman. Yes, DOE has been an effective steward; we remain and will remain world leaders in high energy physics. The U.S. high energy physics program is more than just the "energy frontier" that is often discussed, and perhaps over-emphasized, in some scientific and popular reporting about the field. The high energy physics program is engaged in three scientific campaigns, each of which addresses foundational questions about how the universe works: at the energy frontier, in neutrino physics, and at the cosmic frontier. At the energy frontier we operate the Fermilab Tevatron, still the highest energy accelerator in the world. The Tevatron will be surpassed in total energy soon, by the Large Hadron Collider (LHC) in Europe, but that is why we are heavily involved in LHC so that our scientist will remain leaders at the energy frontier. In neutrino physics, recent discoveries have opened up possibilities that could transform our understanding of particle interactions and the nature of the early universe, so this is a particularly exciting time, and we are the world leaders with operating experiments at Fermilab and in Minnesota, and we are developing several ideas for the future. At the cosmic frontier, we are also leaders in what is called "astro-particle" physics, because we have the world-leading experiments trying to detect the particles that make up the "dark matter" that keeps galaxies from spinning apart, and to measure and understand the mysterious "dark energy" that accounts for three-quarters of the energy in the universe—but no one knows what it is. I should note that the energy frontier won't suddenly vanish in the United States and reappear in Europe. The Tevatron has several productive years remaining as the LHC turns on and the analysis ramp up, during that time the contest for some of the most interesting prizes in particle physics will be intense. As responsible stewards we are doing everything we can to ensure the Tevatron seizes the opportunity.

Chairman Visclosky. Mr. Secretary, it seems as if the department has recently been just reacting to analyses and reports from outside sources (such as MIT) about formulating a national energy strategy rather than playing a leading role in this effort. Such a national strategy should be founded on broad-based, independent, and comprehensive analyses of energy technologies, markets, and impacts. Is there a process in place at the department by which such analyses are both supported and utilized in order to inform the department's energy R&D portfolio decision making as part of a coherent national energy strategy?

Secretary Bodman. The Department acknowledges using outside experts for advisory services whether they originate from academia, consultant firms or industry. These collaborations are a necessary part of building integrity into the DOE decision-making process by considering independent analysis and points of view. The MIT report is just one example of these collaborations. The Department wishes to cast a wide net in regard to ideas and expertise given the broad scale of energy related challenges we must solve.

In regard to building a national energy strategy, the Department's FY 2009 congressional budget request presents a balanced energy R& D portfolio that focuses on achieving stated goals and priorities. The Department used a variety of tools including in-house analysis, external expert opinions and advisory committees to inform how the portfolio could be optimized. For

example, the FY 2009 continues to support the Advanced Energy Initiative (AEI), including additional funding for the demonstration of new licensing processes for nuclear power plants as well as advanced fuel cycle and biomass R&D.

Chairman Visclosky. Given how broadly energy production and use impacts a range of other issues such as water supplies, agriculture, and the environment, this analysis should be broadly coordinated across federal agencies with DOE leadership – is this being done, and if not, how would you suggest going about this task?

Secretary Bodman. The Department does participate in coordination efforts. DOE coordinates its climate change activities (e.g., GhG emissions, land use measures and monitoring) related to energy technology R&D through the multi-agency Climate Change Technology Program or CCTP, which is coordinated by DOE. The CCTP includes NIST, STATE, USAID, DOD, USDA, DOI, HHS (NIH), DOT, EPA, NASA, and NSF. A key product of the CCTP collaboration is the CCTP U.S. Strategic Plan (http://www.climatetechnology.gov/stratplan/final/index.htm) released in September 2006 which, in conjunction with the program's Vision and Framework document, serves to help inform the Department's energy R&D portfolio decisions. Specifically, Chapter 3 of the plan informed the development of the FY 2009 energy portfolio that preceded the MIT report. Currently, the CCTP is encouraging other partnering agencies to consider how DOE applied the plan to inform the development of their portfolio and consider how they may follow this example suit.

Also, in certain instances, the Department uses advisory committees which include members from other federal agencies (as well as private sector experts) to provide technical and programmatic advice. This process helps programs consider other potential impacts of its energy R&D.

Another example is the Biomass R&D Board, which co-chaired by the DOE Assistant Secretary of Energy Efficiency and Renewable Energy and USDA's Under Secretary for Rural Development and includes all of the same agencies listed for CCTP. The Board's mission is to promote the coordination of federal research and development activities relating to bio-based fuels, power, and products.

Chairman Visclosky. Mr. Secretary, the Office of Science appropriations grew modestly in FY 2008, at a rate less than what the members on this committee would have liked to have seen. As a result, some difficult choices were made in prioritizing science programs by the department which the committee would like to explore. In both the Basic Energy Sciences and Nuclear Physics programs, funding for proposals for use-inspired basic research, identified by a number of workshops held by the two programs as critical to broader DOE missions, were cut – what was the rationale for low priority given to these important research proposals?

Secretary Bodman. The modest increase in the FY 2008 appropriation over the FY 2007 appropriation for the Office of Science also represents a $500-million shortfall from the FY 2008 request. In addition, the FY 2007 appropriation was a $300-million shortfall from the FY 2007 Office of Science request. These successive major funding reductions required the Office of Science to make very difficult decisions to curtail or terminate some activities in most of its large

programs. Some user facilities will be closed permanently. Most large scientific user facilities are significantly decreasing hours of operation and service to users. Construction projects and instrument fabrication projects are delayed, resulting in cost and schedule growth. In addition, many promising new activities planned for FY 2008 had to be abandoned, including new initiatives in use-inspired basic research. Funding such new activities under constrained budgets with years of inflationary losses was not possible without incurring major and abrupt terminations and of layoffs in productive core research programs.

The Basic Energy Sciences (BES) budget requests to Congress in FY 2007 and FY 2008 proposed significant increases for use-inspired fundamental research in areas selected to improve our nation's energy security. Thousands of scientists and representatives of DOE energy technology programs and energy industries participated in numerous topical workshops to help define the research agenda for these activities. The increases in the budget requests were part of a government-wide strategy to enhance U.S. world leadership in the physical sciences and maintain our nation's competitive lead in technology as reflected in the administration's American Competitiveness Initiative and the America COMPETES Act, which authorized a doubling of the Office of Science budget over a period of 7 to 10 years.

Four major BES research initiatives in solar energy utilization, hydrogen research, advanced nuclear energy systems, and mid-scale instrumentation were announced and solicitations for research proposals were conducted in FY 2007. Over 700 research proposals were received. Because of the limited funding available in FY 2007, however, only 40 awards were made; most of the remaining proposals were held for funding consideration in FY 2008. Over 200 proposals would have been funded under the FY 2008 request; however, all of the remaining proposals were declined under the actual appropriation.

The Nuclear Physics (NP) budget requests to Congress in FY 2007 and FY 2008 proposed an increase for nuclear physics research directed toward advanced reactor fuel cycles. A broad community of approximately 125 nuclear and computer scientists participated in a 2006 workshop to help define the research agenda for this topical area. Following this workshop, a NP research initiative in advanced nuclear reactor fuel cycles was announced and a solicitation for research proposals was conducted in FY 2007. Approximately 35 research proposals were received in response to the solicitation. Because of the limited funding available in FY 2007 for the overall NP program, no awards were made, and all proposals were held for funding consideration in FY 2008. Limited funding in FY 2008 has lead to the declination of most of the proposals. About 10 percent of the proposals, identified as addressing the very highest priority arising from the workshop, are being reviewed, and will have to compete for funding with other high priority activities within the NP program.

The Energy Frontier Research Centers (EFRCs) proposed in the Office of Science FY 2009 budget request to Congress are based on the Basic Energy Sciences Advisory Committee (BESAC) grand challenges report, Directing Matter and Energy: Five Challenges for Science and the Imagination, the 2003 BESAC report, Basic Research Needs to Assure a Secure Energy Future, and the series of ten follow-on "Basic Research Needs" workshops over the next five years, which are available on the Internet at http://www.sc.doe.gov/bes/reports/list.html. Appropriations for the Basic Energy Sciences at the FY 2009 requested level of funding would

put the Office of Science back on track to pursue the fundamental understanding necessary to help meet the global need for abundant, clean, and economical energy.

Chairman Visclosky. The Office of Science received an increase of $220 million for FY 2008, but in classic "Washington-speak" that is portrayed by many in the science community as a funding cut. Please summarize the near-term and long-term consequences of our FY 2008 funding level for the Office of Science.

Secretary Bodman. Overall, the FY 2008 appropriation for the Office of Science did indeed increase over the FY 2007 appropriation. But, both the FY 2007 and FY 2008 appropriations were significant reductions from the requests, as well as from the levels approved in House and Senate appropriations markups and in authorizations such as the Energy Policy Act and the America COMPETES Act. Surprise and disappointment within the science community are a reaction not to the FY 2008 funding relative to the FY 2007 appropriation, but instead relative to their expectations. Following are examples of the consequences related to the FY 2008 funding levels for various programs.

For the Fusion Energy Sciences, $10.6 million was provided for U.S. participation in ITER, $149 million below the request, which jeopardizes the U.S. participation in construction and operation of an environmentally-benign, large-scale energy source and also damages U.S. credibility in collaborating on this and future international science projects. The budget shortfall has seriously jeopardized the key role the United States is playing in resolving top-level ITER design issues that were identified in the ITER Organization's 2007 Design Review.

For the Basic Energy Sciences, the greatest consequence for the funding reduction was the immediate and permanent closure of the Intense Pulsed Neutron Source at Argonne. Additionally, the funding reduction will result in stretching out construction and major item of equipment projects, impacting costs and schedules. Specifically:

- A 33-percent reduction from the request for the National Synchrotron Light Source-II (NSLS-II) project at Brookhaven will impact readiness for Critical Decision 3. The reduction in funding impacts the project's schedule contingency that is used to ensure the project is completed on schedule and on budget. A reduction in the project's spending rate may necessitate delays in critical experimental facilities R&D activities, completion of the initial linac design activities, or site preparation activities. The NSLS–II will provide a highly optimized storage-ring-based synchrotron light source capable of delivering high brightness and flux and exceptional beam stability required to perform spectroscopy on a single atom. The NSLS-II is designed to serve several thousand users per year, and will be the best storage-ring-based synchrotron light source in the world. More importantly, the U.S. facility will be transformational in that it will open new regimes of scientific discovery and investigation at the nanoscale;

- A 70-percent reduction from the request for the Advanced Light Source User Support Building at Berkeley delays the project by more than one year; and

- A 40-percent reduction below the request delays completion by at least one year for the Instrument projects for the Spallation Neutron Source (SNS) at Oak Ridge and the Linac Coherent Light Source Ultrafast Science (LCLS) at the Stanford Linear Accelerator Center (SLAC). These instruments allow for the effective utilization of two major new U.S. scientific facilities—the SNS was completed in 2006 at a Total Project Cost of $1.44 billion, and the LCLS is scheduled to be completed in FY 2010 at a Total Project Cost of $420 million. New instruments are commissioned in a phased approach in an order that is driven by scientific need and priority. Adding instruments in such an orderly manner at a rate of about one to two instruments per year over the first several years keeps the facilities world-class and allows for dynamic instrument replenishment.

The BES research programs are nearly flat funded with FY 2007, resulting in reductions in effort due to inflation. Operations at remaining BES user facilities (synchrotron light sources, neutron scattering centers, and nanoscale science research centers) are reduced 10 percent—meaning 600 fewer users from universities, national laboratories, and industry. Finally, with no funding for new research initiatives in the use-inspired energy research, BES was forced to decline more than 700 proposals, which have already been peer reviewed. Overall, approximately 50 permanent PhDs, 30 postdoctoral fellows, 20 students, and 10 engineering, technical and administrative personnel will be lost from on-going research programs and the funding cuts will prevent implementation of new research initiatives which would have supported about 400 permanent PhDs, 120 postdoctoral fellows, and 240 students.

The greatest impact of FY 2008 High Energy Physics funding is the premature termination of operations for the SLAC B-factory, with 3 months of FY 2008 operations versus the planned 10 months. Another impact is the delay of the NOvA and Minerva projects at Fermilab—the impact on cost and schedule is not yet known. Also, reductions in funding for the International Linear Collider and Superconducting Radiofrequency cavity research and development create a loss in the U.S. leadership role and jeopardize Fermilab as a candidate site for the multi-billion dollar facility. Finally, the funding reduction creates tremendous impact on the overall staffing levels with a loss of support for 340 engineering, technical, and administrative positions; 100 permanent PhDs; 10 postdoctoral fellows; and 10 graduate students. Overall estimated layoffs are about 225 positions at SLAC, about 200 positions at Fermilab, and about 35 positions at other labs. As an emergency procedure, Fermilab plans to institute a "rolling furlough" of two days each month of leave without pay for all Fermilab employees to avoid a higher layoff level. It is difficult to assess specific long-term consequences, but I think it is clear that reducing our investment in basic scientific research today will inevitably reduce the payoff in new, groundbreaking technologies, and the trained workforce to exploit them, tomorrow.

Chairman Visclosky. How many personnel reductions, reductions in the level of facility operations, or facility closures in the Office of Science programs would have happened anyway at the President's requested level?

Secretary Bodman. Within the FY 2008 President's request, the Office of Science anticipated a reduction of 100 scientific positions at SLAC, as a result of the planned B-factory shutdown at the end of FY 2008. With the FY 2008 appropriation, the B-factory closure was accelerated to February 2008.

Chairman Visclosky. Will the Administration request funding for the United States contribution to ITER, or for other critical FY 2008 Science activities, in a supplemental request?

Secretary Bodman. The Department recognizes the funding shortfall for ITER and is working to address it. There has been no administration decision to seek supplemental appropriations for ITER.

Chairman Visclosky. Please provide for the record a response to the following questions. In November 2006, the United State signed an agreement with China, Japan, India, South Korea, Russia and the European Union to help build and operate the International Thermonuclear Experimental Reactor (ITER) in Cadarache, France, to demonstrate the feasibility of fusion energy. DOE identified ITER as the number one priority for new research facilities because fusion power holds the promise of reducing concerns over imported oil, rising gasoline prices, and global warming. The ITER Organization, which manages the construction and operation of ITER, had faced a number of delays in selecting the construction site and finalizing the design of the reactor which affect U.S. schedule and cost. In 2006, the preliminary estimate for U.S. contributions to ITER was $1.12 billion. Since then, this estimate has increased and is now between $1.45 and $2.20 billion. Although DOE has not to date established a baseline for U.S. contributions to ITER, does not expect to establish a baseline until the end of FY 2009 or early 2010, and cannot procure components or parts without a baseline, DOE asked for $214,500,000 in FY 2009 for ITER construction costs. To what extent does DOE need this level of funding for test designs and long-lead procurements?

Secretary Bodman. The full $214,500,000 requested for FY 2009 is essential to resume full-scale U.S. participation in ITER. Specifically, $60,000,000 will enable the resumption of design activities for U.S. hardware components $30,000,000 will re-start pre-fabrication R&D (both design and R&D are essential to establishing a performance baseline), and $69,500,000 will initiate long-lead procurements for U.S. in-kind hardware. In addition, $18,000,000 will also support the U.S. ITER Project Office $2,000,000 is for U.S. secondees and $35,000,000 permits the United States to meet our 2008 and 2009 cash commitments to the IO per the terms of the ITER Joint Implementing Agreement. The DOE Order on project management allows for long-lead procurements where significant schedule and cost risk is mitigated with small, managed advanced purchases of items whose designs are sufficiently mature. For ITER, these long-lead procurements are a small fraction (less than 5 percent) of the total project cost and mitigate project schedule risk. Examples include magnet conductor materials and bulk steel for magnet structures.

Chairman Visclosky. What has been the reason for the delay in the establishment of a validated baseline, especially given that the ITER Organization has now finalized the design for the reactor?

Secretary Bodman. The 2007 ITER Design Review established a reference design that identified a number of key issues that must be promptly resolved to reach an overall design that provides the basis for establishing a validated baseline and supporting the beginning of construction. These issues encompass design measures to ensure adequate plasma confinement

and stability, facilities for remote handling of radioactive components, design of the first wall and vacuum vessel, and quality assurance testing of the superconducting magnets. The ITER Organization and all seven ITER members are working hard on addressing these issues in the months ahead to enable hardware fabrication to proceed.

Chairman Visclosky. The cost range for the U.S. contribution to ITER has increased to between $1.45 and $2.20 billion. Why such a large disparity and what is the benefit of spending more than $1.45 billion?

Secretary Bodman. Estimates for completing the U.S. ITER project scope show large ranges of uncertainty, which are reflected in the current cost range. About 28 percent of the increase is caused by maturity of the present design. Most of the increase, however, is driven by two factors beyond DOE's control: 41 percent of the increase is attributable to design, scope and schedule requirements dictated by the ITER Organization and by the European Union/French regulatory authorities, and 31 percent is attributable to external factors, such as exchange rates for the Euro, commodity prices, and market conditions, that have changed dramatically since the 2003 estimate for the cost of U.S. participation was derived. Naturally, DOE will do everything possible to minimize the Total Project Cost and still live up to our ITER commitments.

SPENT FUEL MANAGEMENT

Chairman Visclosky. We all agree that we need the repository at Yucca Mountain, for existing spent fuel and for high-level radioactive waste. Ward Sproat is doing an exceptional job trying to keep the repository program on track, and we commend him for his dedication and focus. However, we face two major problems with our current Yucca Mountain strategy. First, Yucca Mountain as presently authorized does not have sufficient capacity. It will reach its authorized capacity for commercial spent fuel in 2010 and, as we learned at these hearings last year, can only accommodate at best half of the high-level waste and defense spent fuel that is presently stored at other DOE sites. Second, Yucca's political prospects are very doubtful. Both Democratic candidates for President have said they oppose this project, and the Senate Majority Leader and the State of Nevada have numerous avenues available to block the project from going forward. This situation leads to several questions about how we will deal with spent fuel going forward.

In addition to Yucca Mountain, there are only a limited number of options available for dealing with spent fuel: interim storage at reactor sites, investigation of additional or alternative repository sites, and recycling of the spent fuel. I understand why Mr. Sproat views any of these options as distractions from his primary focus on getting the repository license application submitted this year. But in the larger scheme of things, from the perspective of this Committee or of you as the Secretary, that license application alone won't be sufficient. Please summarize the Committee's conference direction on interim storage and explain how the Department intends to comply with that direction. When will the Department submit the required interim storage plan?

Secretary Bodman. The FY 2008 report language directed DOE to develop a plan for accepting spent nuclear fuel currently stored at decommissioned reactors at either an

existing federal site, at one or more existing reactor sites, or at a competitively-selected interim storage site (including those sites that volunteered to host Global Nuclear Energy Partnership facilities). The Department is currently preparing a report in response to this direction that will provide a proposed approach to developing federal interim storage capacity. The report should be available within a few months.

Chairman Visclosky. What is the Department doing regarding the requirement in section 161 of the Nuclear Waste Policy Act regarding the need for a second repository? When will the Department make its required recommendation to Congress, which must be made not later than January 1, 2010?

Secretary Bodman. The Department is currently preparing a report with options for the Congress to consider that will respond to the requirement of Section 161 of the Nuclear Waste Policy Act regarding the need for a second repository. The Department plans to finalize this report and transmit it to the President and the Congress late this summer or early fall.

Chairman Visclosky. The Department has thoroughly bungled its efforts on recycling spent fuel under the Global Nuclear Energy Partnership (GNEP). What began as a logical concept that deserves a more research has been hijacked by various interests inside and outside the Department, with the result that even supporters of recycling have abandoned GNEP, and the opponents of recycling have not changed their minds. In any case, GNEP as most recently proposed by the Department would not address legacy spent fuel and would be decades away from ever handling new spent fuel. Do you view GNEP as the Department's sole alternative to Yucca Mountain?

Secretary Bodman. Under the Nuclear Waste Policy Act the Department has the responsibility to provide for the permanent disposal of spent nuclear fuel and high-level waste in a permanent repository. The Department is obligated to submit a License Application to construct a repository at Yucca Mountain. The Global Nuclear Energy Partnership initiative, which proposes to develop and ultimately deploy technology to recycle commercial spent nuclear fuel, is not an alternative to Yucca Mountain. Under any recycling scenario, the Yucca Mountain repository will be needed to handle the large existing commercial and defense spent nuclear fuel inventories and high-level radioactive waste inventories, as well as the high-level waste that would be generated by GNEP facilities and other spent nuclear fuel not suitable for recycling. The GNEP and Yucca Mountain programs are complementary initiatives that would bring significant benefits to the nation.

Chairman Visclosky. Does the Department still have a legislative proposal on Yucca Mountain pending before Congress? If so, please explain your legislative strategy for getting this proposal through Congress in an election year, when it made no progress whatsoever last year?

Secretary Bodman. The Administration still has a legislative proposal on Yucca Mountain pending before Congress and continues to support legislation to accelerate the Yucca Mountain program through funding reform, land withdrawal, authorization to begin infrastructure

upgrades, and licensing streamlining. The Administration has briefed members of the Congress on the benefits of passing the legislation and requested hearings on the proposed legislation.

Chairman Visclosky. Does this proposal still contain legislation to address waste confidence, an issue about which Chairman Visclosky had previously said it would be a "profound mistake" to attempt to legislative a solution to waste confidence? If this is still part of the Department's legislative proposal, please explain why you are ignoring the advice of key appropriators, and explain who is encouraging you to include waste confidence in your legislative proposal.

Secretary Bodman. The Administration's legislative proposal contains provisions regarding waste confidence. We would encourage members of Congress to provide alternative legislation that can be enacted and would look forward to a dialogue on legislation for the Yucca Mountain program. Waste confidence is included in the Administration's legislative proposal because it represents a key uncertainty which we believe must be addressed to allow nuclear plant construction to proceed.

Chairman Visclosky. What is the current schedule for the Department to submit the license application to the Nuclear Regulatory Commission?

Secretary Bodman. Earlier this year the Department undertook an evaluation of the impact of the $108 million reduction in the FY 2008 funding on the Program and its ability to submit a License Application to the Nuclear Regulatory Commission (NRC) for authorization to construct the Yucca Mountain repository. The Department has completed that evaluation and, due to significant improvements in management practices and processes, we currently plan to submit the License Application to the NRC in June 2008.

Chairman Visclosky. What is the current estimate of outstanding liability for the Department's failure to accept commercial spent fuel for disposal, as it was required to do beginning in January 1998? Where, if anywhere, is this liability reflected in the Department's budget or in the overall budget of the federal government?

Secretary Bodman. The Department has estimated that the liability associated with the delay in beginning the acceptance of spent nuclear fuel in 1998 could be as much as $11 billion assuming a 2020 opening date. Litigation settlements or damages are not part of the funding request for the Yucca Mountain program or the Department's budget. Payments to utilities to settle litigation against the government for the Department's delay in waste acceptance have come from the Department of Treasury's Judgment Fund. The Judgment Fund is managed by the Department of the Treasury, with assistance from the Department of Justice, to pay for any damages incurred by the U.S. Government. In 2002, the 11th Circuit Court of Appeals ruled that the Department was not authorized under the Nuclear Waste Policy Act to spend Nuclear Waste Fund monies on settlement agreements aimed at compensating utilities for onsite storage costs.

Chairman Visclosky. Does the Department ever intend to seek funds to reimburse the Judgment Fund for settlements and damage payments for spent fuel claims? If not, please explain why not?

Secretary Bodman. No. Payments to utilities to settle litigation against the government for the Department's delay in waste acceptance have come from the Department of Treasury's Judgment Fund. In 2002, the 11th U.S. Circuit Court of Appeals ruled that the Department was not authorized under the Nuclear Waste Policy Act to spend Nuclear Waste Fund monies on settlement agreements aimed at compensating utilities for onsite storage costs. Under current law, payments from the Judgment Fund are not required to be reimbursed by the Nuclear Waste Fund or by the Department.

STAFF ING OF SECURITY OVERSIGHT PROGRAMS AND DOE AND NNSA SITE AND OPERATIONS OFFICES

Chairman Visclosky. Having sufficient staff to oversee the security programs of its contractors has been a persistent problem. A number of independent assessments have identified challenges regarding DOE's federal security workforce that have made it difficult for the Department to effectively oversee security activities. These challenges include: (1) the number and mix of the federal security staff, (2) the near-term retirement eligibility of a significant percentage of the security workforce, and (3) the lack of professional development and training programs. What efforts have been taken to improve security oversight at the site office level?

Secretary Bodman. In accordance with Public Law 106-65, the Chief of Defense Nuclear Security at the National Nuclear Security Administration oversees the performance of site office and contractor operations to ensure programmatic and security expectations are fully met. Programmatic oversight is executed through the annual Contractor Performance Evaluation process and security oversight is carried out through a rigorous Performance Assurance Program that evaluates the effectiveness of the site office and contractor security programs annually. Security oversight through the Performance Assurance Program is also focused providing the NNSA's and Department's leadership with early and continuous feedback through an annual series of internal self-assessments, site office reviews, and headquarters formal evaluations.

In May 2007, the Acting NNSA Administrator identified areas in which additional federal management oversight should be applied. The Federal Oversight of Physical Security team was established to refine expectations and practices for federal oversight of the M&O Contractors. The Federal Oversight of Physical Security team completed its review and issued a final report on January 7, 2008, that identified more than 30 individual recommendations that would significantly improve the quality of security oversight. These recommendations are being implemented at the site offices as appropriate. The one overarching action for implementation is defining and promulgating an NNSA risk-based oversight framework that captures the best ideas of the systems in place today. The framework will be specific enough to accomplish the desired outcome, but flexible enough to permit tailoring to each site. It is anticipated that this document will be completed by mid-2008.

Chairman Visclosky. Which NNSA site offices are currently experiencing staffing shortfalls?

Secretary Bodman. Currently, all NNSA site offices are experiencing minimal security-related staffing shortages. There are actions in process to hire staff needed to fill the vacancies. Most security staff are responsible for multiple programs and maintain a large workload.

Chairman Visclosky. What efforts have been taken to ensure that site office security staff receives ongoing training? Has a professional development program been implemented?

Secretary Bodman. NNSA ensures all site office's security staff are fully prepared to execute their program management and oversight responsibilities through a formal security Training and Qualification Program (TQP) conducted at the Department's National Training Center. To obtain qualification, security personnel must successfully complete 57 required competencies in the areas of physical security, personnel security, information security, and material control and accountability. Once qualified, security personnel are required to re-qualify every three years. Currently in NNSA, there are 34 enrolled in the TQP or similar program, of those, 13 are certified.

Chairman Visclosky. How is DOE determining its long-term security staff needs? What steps are being taken to address potentially high rates of attrition at DOE operations and NNSA site offices?

Secretary Bodman. NNSA has taken several measures to address potential high rates of attrition. One immediate step taken by NNSA to address recruitment and retention at site offices was to expand our Future Leaders intern program. The authorized staffing level of the Future Leaders Intern Program was increased from 40 in FY 2006 to 53 in FY 2008 and 57 for FY 2009. Funding for this program is at $8.3 million in FY 2008 and $9.2 million in FY 2009. Our Future Leaders Intern program provides the site offices with highly educated and skilled resources to offset potential increased attrition. Over the past two years, the NNSA has also been conducting an agency-wide workforce analysis to understand current and future workforce requirements across the nuclear security complex. Our workforce analysis considers estimated recruitment and retention rates and serves as a basis for future budget submissions.

WEAPONS

Chairman Visclosky. In last year's appropriation report, we directed you to deliver to us a nuclear strategy justifying your budget request. Is that strategy ready to deliver? I can't stress this enough. We would not be responsible if we were to spend the taxpayers' money for weapons without understanding and approving the strategy those weapons are going to serve.

Secretary Bodman. In July 2007, the administration provided Congress the white paper "National Security and Nuclear Weapons: Maintaining Deterrence in the 21st Century." This paper provided a broad rational for U.S. deterrence policy. A second, detailed and classified, white paper is forthcoming that will provide additional deterrence justification as well as the reasons underpinning current and future force levels. It should be noted, however, that targeting requirements and their associated required weapons characteristics remain the responsibility of the Department of Defense and specifically the U.S. Strategic Command and not the Department of Energy.

Chairman Visclosky. We directed you to deliver a nuclear stockpile plan: how many warheads do you intend to keep, which ones do you intend to LEP and how and why? Is that plan ready to deliver?

Secretary Bodman. We delivered in May 2004, in a classified report to Congress, our plan for the size and composition of the nuclear weapons stockpile required to support a force of 1,700-2,200 operationally-deployed strategic warheads and a small number of non-strategic warheads. In that report we addressed life extension program issues. We updated that plan in 2007 and provided Congress with that updated plan in another classified report to Congress transmitted by Secretary Gates and Bodman in March 2008.

Chairman Visclosky. We directed you to deliver a nuclear complex transformation plan. I understand that you can't decide on the complex before you know what force it's going to support. But to get ahead of the game, it would be in everybody's interest for you to hypothesize a few plausible nuclear force configurations and sketch out what the complex to support these configurations would look like. Are you doing that?

Secretary Bodman. We agree and are doing that. In partnership with the Department of Defense, we are looking at a range of plausible nuclear force configurations to evaluate transformation alternatives and develop a Complex Transformation plan. The stockpile configurations being considered include both continuation of a life-extension program strategy without Reliable Replacement Warhead (RRW) concepts and paths that include transition with an RRW strategy to enable us to understand what capabilities could be reduced or eliminated with an RRW strategy. The alternatives analyzed in the Draft Complex Transformation Supplemental Programmatic Environmental Impact Statement (SPEIS) take into account that the size of our nuclear force could continue to change; some of the alternatives would provide reduced capabilities in light of the possibility that the President could decide to make additional reductions in the stockpile. The Draft SPEIS and supporting references are available on the web at www.complextransformationspeis.com.

Chairman Visclosky. Mr. Secretary, the main advantages of the RRW program were advertised as a warhead so reliable that it would free us from the need to do nuclear testing, thereby reducing the probability of nuclear proliferation. It was supposed to be so reliable that it would allow us to reduce the nuclear weapons stockpile to what we need for tomorrow, rather than what we thought we needed in the Cold War.

But on nuclear testing, this administration refuses to ratify the Comprehensive Test Ban Treaty signed by the Clinton Administration. On stockpile levels, you accept only Strategic Offensive Reduction Treaty. It has no counting rules and it only applies for one day. Your administration talks about no testing and smaller stockpiles. But when the time comes to sign on the dotted line – the CTB and START II the Administration refuses. The advertised benefits of RRW appear to be vaporware. If you got RRW funded, we have no reason to expect you won't build it in addition to -- not instead of -- the legacy stockpile, keeping both and doing nuclear tests on both. I hope you can prove me wrong. Do it now.

Secretary Bodman. We have a very successful Stockpile Stewardship Program—developed over the last 15 years in response to the underground nuclear testing moratorium—that continues to evolve and sustain the stockpile. However, while today's stockpile remains safe, secure and reliable, the weapons laboratories and the Department of Defense are concerned about our future ability to maintain the stockpile without nuclear testing. The Stockpile Stewardship program has worked well, so far, to discover and resolve problems that in the past would have required nuclear testing. Maintaining certification of the finely-tuned designs of an aging Cold War stockpile through Life Extension Programs, however, is becoming increasingly difficult absent nuclear testing, and involves increasing risk. Our aging warheads will continue to be a technical challenge for our best scientists and the risk of a significant technical failure occurring as our warheads age cannot be eliminated. We do know with certainty that warhead certification will become more difficult—especially as life extensions and component aging move the warhead further away from the tested design. The reliable replacement warhead (RRW) is one means which we were studying to determine how we might better transform the future stockpile to address these issues, how we could incorporate modern safety and security technologies into our systems.

While we are confident that today's stockpile is safe and reliable, it is prudent to explore alternative means to ensure stockpile reliability over the long term. We are dealing with nuclear weapons and any error or slight uncertainty is an unacceptable risk, this was a significant consideration supporting the RRW concept. RRW is intended to provide the nation with nuclear weapons that are more secure, safer and more reliable than those in the current stockpile. RRW is designed to use more benign materials, improved margins in manufacturing tolerances, and incorporate safety and security features that did not exist and cannot be backfitted into our legacy systems. In short, RRW is designed to be a warhead with high confidence and 21st Century anti-terrorism features. Additionally, the RRW is intended to be a replacement for current warhead systems while introducing no new military capabilities into the stockpile.

The United States continues to observe its unilateral moratorium on nuclear testing, and encourages other governments to maintain their own moratoria. While the United States does not support ratification of the CTBT, the President has made clear that the United States has no known requirement for nuclear testing. We are confident that the Stockpile Stewardship Program provides the tools to ensure RRW safety and reliability without the need for nuclear testing. Stockpile stewardship, however, provides no guarantees and we cannot rule out the need for a test in the future. For this reason, and because of concerns about verification of the Treaty, the United States will not pursue CTBT ratification.

Chairman Visclosky. The universal criticism of the legacy stockpile is that the weapons were designed to maximize yield-to-weight, but that reduces margin and reliability. The W88 has the highest yield-to-weight of any warhead in the world, meaning that for today's purposes – notwithstanding that it's the newest design – it's the worst and most obsolete warhead. In addition, the Trident ships are due to begin retirement in ten years. Yet you've spent [$1.5 billion] to develop and produce a new pit for the W88 warhead for the Trident II missile, and you're proposing to spend [$199 million] per year to produce about 30 pits for testing. Why do we need to spend that money on an obsolete warhead that will have a diminishing number of MIRV buses to put them on? Why shouldn't you take your test warheads out of the active force,

gradually drawing down the number of active W88s? You say you want to reduce the stockpile. Here's a way to do it at zero dismantlement cost: Don't build it and you don't have to pay to dismantle it.

Secretary Bodman. Mr. Chairman, the W88 warhead is the newest of all weapons in the U.S. nuclear stockpile. It's true, the W88 has the highest yield-to-weight ratio of any warhead in the stockpile, but it also incorporates the most modern enhanced nuclear detonation safety features. The W88 meets all performance, reliability, and safety requirements.

Stockpile requirements for W88 deployment, logistics, and spares are documented in the Nuclear Weapon Stockpile Plan (NWSP) signed by the President. Providing the DoD with the right weapon to accomplish its mission is DOE's highest priority. Based on current DoD mission planning, the W88 warhead is fully utilized with 90 percent of the assets deployed. Because of its unique performance capabilities, W88 requirements from the DoD are not expected to change with a reduced stockpile, and current Trident planning calls for continued utilization of this warhead for the next three decades. However, I defer to the Navy and U. S. Strategic Command (STRATCOM) Commander for a definitive explanation of the Trident SSBN's future fleet deployment.

With 90 percent of all W88 warheads deployed, there are insufficient spares available for maintenance, logistics, fleet support and surveillance. We discontinued pit manufacturing in 1989 with the closure of the Rocky Flats Plant. The plant was closed at the start of a W88 pit production run, leaving the DoD's original production requirement unfulfilled. This action also prevented us from producing surveillance pits throughout the life of the W88 program. As DOE moved to reestablish the nation's pit manufacturing capability, we selected the W88 pit because of its limited ration of supply to deployed weapons.

With regards to total expenditures, approximately one-half of all pit program and certification costs supported the reconstitution of the manufacturing and stringent quality infrastructure that is needed to produce pits to war reserve specifications. The remaining 50 percent was dedicated to engineering and physics testing required to validate equivalency of performance to those pits manufactured at the Rocky Flats Plant. This capability is essential to the Stockpile Stewardship program's ability to confirm reliability of the nation's stockpile without the need for underground nuclear testing. For FY 2009, 75 percent of the requested $199 million annual expenditure will be dedicated to maintaining our manufacturing and quality infrastructure and will go toward manufacturing a limited number of W88 pits. The remaining funds will continue the modernization of our facilities and equipment to increase efficiencies and ultimately reduce the costs per pit manufactured.

Chairman Visclosky. The National Defense Authorization Act of 2003 requires you to deliver to Congress an annual assessment of the nuclear stockpile. The Act doesn't define what body of Congress it should be delivered to. We want it delivered to this Subcommittee, in addition to wherever else you deliver it. Will you do that?

Secretary Bodman. Yes, I will endorse delivering the report to your Subcommittee. The National Defense Authorization Act of 2003 requires that the Secretary of Energy and Secretary

of Defense submit the report on Assessments to the President by March 1. The President shall forward the report to Congress by March 15 of each year.

Chairman Visclosky. Thank you. Now the latest Annual Assessment by law is due to Congress March 15, that is in a little more than two weeks. Since this is a leap year, you get an extra day to work on it. With that in mind, are you going to get it to us in time?

Secretary Bodman. No, I cannot commit to when the reports on assessments will be delivered to Congress. The Department and our laboratories have completed their assessment. However, the report is still in coordination within the Nuclear Weapons Council and between the Department of Defense and Department of Energy. The White House will be able to deliver the annual assessment report to Congress when this action is complete.

Chairman Visclosky. Mr. Secretary, the idea that later translates to better on this report troubles me on two counts. First, because the guts of this report, all the meaning, is in the letters from the three lab directors. It's those letters, plus the COMSTRAT report that isn't under your purview, that we really need. They don't get better with age. They are due to the Nuclear Weapons Council on December 1, and have always been delivered on time. By law, after December 1 they may not be altered. So you could keep them for a hundred years, and they wouldn't get any better because you can't change them. Second, because nuclear weapons technology moves at a very fast pace. The picture changes significantly from month to month, and even from week to week. The delay from December to March in the law is bad enough, but if you stretch it out into more months, or even a year as has happened, it becomes obsolete. So will you now commit to making whatever procedural changes are needed to get the report here on time?

Secretary Bodman. Yes, I agree that the reports should be submitted in a timely manner. Once the USSTRATCOM Commander and National Laboratory Directors' assessments are delivered to the Nuclear Weapons Council, the coordination between the council members and its subcommittees takes time. The nuclear weapons business operates with zero tolerance for error and coordination from several divergent agencies in this arena is cumbersome. I will commit to work within my Department to streamline processes and expedite coordination within my Department, but significant collaboration is required outside of our Department after our National Laboratories have completed the Assessment. We will work with the Department of Defense to make procedural changes.

THURSDAY, MARCH 6, 2008.

# DEPARTMENT OF ENERGY—ENVIRONMENTAL MANAGEMENT, LEGACY MANAGEMENT

**WITNESSES**

**JIM RISPOLI, ASSISTANT SECRETARY OF ENERGY FOR ENVIRONMENTAL MANAGEMENT**
**MICHAEL OWEN, DIRECTOR, OFFICE OF LEGACY MANAGEMENT**

## CHAIRMAN VISCLOSKY'S OPENING STATEMENT

Mr. VISCLOSKY [presiding]. I would like to call the committee to order. This afternoon, we are honored to have Assistant Secretary for Environmental Management James A. Rispoli. He is accompanied by Mr. Michael Owen, Director of the Office of Legacy Management.

Before we go any further, I do want to thank you because typically we do not start hearings at 3 o'clock in the afternoon, but I hope you appreciate, given the schedule we have, that we are compelled to do so.

I also do want to thank my colleagues very much, because we are done voting for the week, but nevertheless you are in attendance, and I really appreciate that very much.

Mr. Rispoli, the total Environmental Management budget for fiscal year 2009 is $5.5 billion, a reduction of $167 million from the budget the president recently signed for 2008. Most disturbingly, the fiscal year 2009 level of funding will, and this is quoting Secretary Bodman, not meet some of the milestones and obligations contained in all of the environmental agreements that have been negotiated over many years with regulators. Again, the Secretary said that last week during his hearing, as well as according to your testimony.

Unfortunately, the budget request does not indicate what milestones will be missed or the consequences of missing them, so we will spend some time today going over that. I know that during your 10 years as Assistant Secretary, you have been working very hard to rectify a very chaotic project management system. Understandably, it will take several years for your initiatives to be fully embraced and implemented.

In the meantime, we continually hear from our valued partners at the Government Accountability Office that project management standards are still not being applied, such as the case of the balkanized project at Hanford. Increasingly, policy decisions are overtaxing existing projects such as the decision to run H Canyon another decade at Savannah River and its impact on the operations of the finely balanced liquid waste management system.

Sometimes the lack of decision exacerbates management of projects, such as an unclear path for low activity waste at Hanford,

which has significant impacts on the schedule and costs of getting the work done.

These are some of the items I would like to cover with you here today.

Mr. Owen, you manage the sites when the cleanup has been complete, including the management of the pensions of former workers. We are interested in hearing from you today about your organization and the challenges you are facing in the future as more sites cross the finish line.

Mr. Rispoli and Mr. Owens, I ask that you ensure that the hearing record of the questions for the record and any supporting information requested by the subcommittee are cleared through the department and the Office of Management and Budget and delivered in final form to the subcommittee no later than 4 weeks from today.

All members of the Committee who have additional questions for the record should submit them to the subcommittee offices by noon tomorrow.

With those comments, Mr. Hobson, if you would have any opening statement you would care to make, I would recognize you.

## MR. HOBSON'S OPENING STATEMENT

Mr. HOBSON. Thank you, Mr. Chairman.

I want to welcome Assistant Secretary Rispoli and Director Owen for what will probably be their last appearance before this subcommittee, and this is probably my last appearance here in this chair with you at this time. Both of you bring a Department of Defense-style of project management and business practices to the organizations in DOE, and while everything is not as rosy as we would like in those programs, they are certainly better managed than they were before your involvement.

I want to thank both of you for your dedicated public service and your efforts that you are doing now. It is better, but we still have some concerns and I think you understand and share our concerns on some things. I just again want to say thanks for what you do.

With that Mr. Chairman, I yield back.

Mr. VISCLOSKY. Thank you very much.

Mr. Rispoli.

## MR. RISPOLI'S OPENING STATEMENT

Mr. RISPOLI. Thank you. Good afternoon, Chairman Visclosky, Congressman Hobson, members of the subcommittee. I am pleased to be here today and would like to note that this year marks 20 years since the environmental management program was first established. Imagine that. Clearly, a lot has been accomplished, but a lot more needs to be done.

I would also note, Mr. Chairman, that today marks, as Congressman Hobson said, the last time that I have a scheduled opportunity to testify before you on this subcommittee regarding our program's budget request. When I first appeared before this subcommittee 2 years ago, I pledged that safety would remain our first priority. No milestone to me is ever worth an injury to our workforce.

Today, I am pleased to report that worker injuries have been reduced by 50 percent during the past 3 years, and our injury rate is less than 10 percent of comparable commercial waste disposal and construction industries.

The second priority that I discussed with you is my goal of making EM a high-performing organization. I thank this subcommittee because you made it possible for us to collaborate with the National Academy of Public Administration to help us in improving our program. We are very proud that in addition to the constructive sessions and dialogue opportunities with them, they concluded in their report that EM is on a solid path to becoming a high-performing organization.

Third, when I was sworn-in to this position, I set about to refine all of EM's cost and schedule baselines which guide every project. During the past 18 months, all EM projects, both line item and operating, have undergone independent audits to verify our costs and schedules as valid and reasonable. Today, our project estimates and assumptions can be viewed by us and by you and the Congress with greater confidence than ever before as a result of this very, very rigorous process over 18 months.

At that time, I also stated that our goal was for the cost and schedule performance of at least 90 percent of our projects to be on target or better than on target. In July of 2005, per a report that is put out by our Office of Engineering and Construction Management, 17 of our projects were not on cost and on schedule. Today, our portfolio of projects consistently meets or beats the 90 percent goal. In fact, today we have one project, the DUF6, that is listed as not on cost/on schedule.

Turning now to our fiscal year 2009 budget request for $5.528 billion, it is based on the principle of prioritizing risk reduction across the DOE complex. Let me address an issue that I know has caused you concern that this request has broken with past understandings related to the department's cleanup budget strategy.

I would like to recall and state the testimony my predecessor gave to this subcommittee in both 2003 and 2004. Then-Assistant Secretary Jessie Roberson testified, "After a period of accelerated funding peaking in fiscal year 2005, we anticipate funding will then decline significantly to about $5 billion in 2008." Viewed from this perspective, our 2009 budget request is actually about $500 million more than what she projected on two occasions 5 years ago.

The independently audited cost and schedules that I referred to were developed using our 5-year funding profile, and you have a 5-year funding profile, a bar chart, I believe, in front of you. It shows that the year that we are in now is the low point of where we are, but it is important to note that the estimates we worked up for the multi-year funding and the audits we went through match this funding profile that was given to the Congress last spring after the budget came in last year.

This gave us a predictable funding profile because all your project costs and schedules have to be planned out to predictable funding, and this is the funding targets profile that we used as delivered last year to you. As you can see, our 2007–2008 appropriations, as well as our 2009 request, track with that 5-year profile.

The administration recognizes that with the budget before you today, some of the milestones contained, as the chairman stated, in our agreements are in jeopardy of being missed. Please note that other milestones are in jeopardy due to technical reasons. There are not only budgetary reasons, but technical reasons as well.

As a result, we have had to make difficult decisions regarding our priorities. The milestones that guide our work, the regulatory milestones that guide our work, have been and remain important measures of progress. The Department's strategy is to continue to focus on cleanup that will produce the greatest environmental benefit and the largest amount of risk reduction across the nation.

Before I close, I would like to note two accomplishments that demonstrate the progress we are making regarding risk reduction. You have a photo in front of you that demonstrates that 50,000 tons of equipment at Building K–31 at Oak Ridge—this is the weight of a World War II destroyer—50,000 tons of equipment have been removed from that building. This is about a 40 football field-size building. Now that this high-risk material has been removed, the building is available for industrial reuse.

The second photograph that you have shows our contractors at Idaho removing transuranic waste, contaminated with organic chemicals that were disposed of in drums years ago. These drums are now decaying and their contents do pose a threat to the underlying Snake River plain aquifer. The photo you see and the enclosure that you see in the photo allows the workers to continue to reduce risk in all weather conditions, but more importantly, prevent contamination from spreading.

Mr. Chairman, I am proud of the progress our 34,000 contractor and federal workers have made in recent years and the wise and secure foundation we have built for the future. This subcommittee has provided critical guidance that has enabled us to accomplish the successes we have had to date. I look forward to working with you in my remaining time at the department, and I thank you for your consistent support over the years to reduce the risk to our citizens, our communities and our nation.

I will be happy to answer your questions. Thank you, sir.

The written statement follows:]

**Statement of James A. Rispoli**
**Assistant Secretary for Environmental Management**
**U.S. Department of Energy**
**Before the Subcommittee on Energy and Water Development, and Related Agencies**
**Committee on Appropriations**
**U.S. House of Representatives**

**March 6, 2008**

Good morning, Mr. Chairman and Members of the Subcommittee. I am pleased to be here today to answer your questions on the President's Fiscal Year (FY) 2009 budget request for the Department of Energy's Office of Environmental Management (EM). I want to thank the Subcommittee for your support of the EM program.

The year 2009 will mark 20 years since the EM program was first established just as the Cold War was coming to an end. While the budget we are considering today is oriented toward the future, I think it is appropriate to begin today by considering how much this program has accomplished since its creation.

At that time, nearly 50 years of nuclear weapons production and energy research had left a legacy of enormous amounts of waste and environmental contamination at more than 100 sites across the country. The extent of the risk to our citizens and communities was literally unknown, and certainly many of the processes and technologies to reduce that risk had not yet been invented.

Since then, we have closed 86 of 108 sites nationwide. The national "footprint" of the Department's nuclear complex and its accompanying risks has been drastically reduced, and eliminated altogether from many states. We have packaged and safely stored all of the nation's excess plutonium inventory. We have pioneered new technologies that have allowed us to make progress retrieving millions of gallons of tank waste, and to safely dispose tens of thousands of cubic meters of transuranic waste. In FY 2006 and FY 2007 alone, we demolished approximately 500 buildings (nuclear, radioactive, and industrial) as part of our decontamination and decommissioning (D&D) projects. And finally, we have made great strides in protecting groundwater using innovative treatment systems.

Today marks likely the final time that I will be testifying before you regarding our program's budget request. When I first assumed the position of Assistant Secretary for Environmental Management in August 2005, I set out to institute a rigorous project management system, and, above all, to continue to emphasize safety and risk reduction. I sought to refine and independently verify our project baselines – the estimates of scope, schedule and cost that guide every project – to ensure that they are realistic and executable. I will discuss our successes in this area as well as our ongoing challenges.

The FY 2009 budget request is once again built on the principle of prioritizing risk reduction across the *entire* complex for which EM is responsible, supported by our four guiding tenets of safety, performance, cleanup and closure. The budget request totals $5.528 billion, a decrease of $167 million from the FY 2008 appropriation. With 90 percent of our budget addressing mission activities at our cleanup sites, more than half of FY 2009 funding will go towards our highest-risk activities of stabilizing tank waste, nuclear materials and spent nuclear fuel; another one-quarter of the budget will be devoted to cleaning up contaminated soil, groundwater, and excess facilities, and about 14 percent going to manage wastes streams related to those cleanup activities. The remaining 10 percent covers mission activity support, including costs for program oversight provided by our federal personnel, and technology development.

Mr. Chairman, let me point out that the Administration recognizes that EM's FY 2009 budget request of $5.528 billion is based on, and would implement, an environmental management approach under which the Department would not meet some of the milestones and obligations contained in the environmental agreements that have been negotiated over many years. It is also important to recognize that some upcoming milestones will be missed regardless of the approach that is chosen and its associated level of funding.

Moreover, some of the relevant agreements were negotiated many years ago, with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. This incomplete knowledge, coupled with other issues including contractor performance, overly optimistic planning assumptions, and emerging technical barriers, also have impeded the Department in meeting all milestones and obligations contained in the environmental compliance agreements.

In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people.

In determining these priorities, the Department works closely with the federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with the Department.

## MANAGING OUR PRIORITIES

When I appeared before this Subcommittee two years ago, I pledged that safety would remain our first priority. All workers deserve to go home as healthy as they were when they arrived at the job in the morning. No milestone is worth any injury to our workforce. I am pleased to say that EM's safety performance continues to be outstanding. As a result of collaborative efforts by DOE and our contractors, worker injuries have been reduced by 50 percent during the past three years. Currently EM's injury rate is less than 10 percent of comparable commercial waste disposal and construction industries.

Another priority we discussed two years ago was my goal of making EM a high-performing organization by every measure. This goal has required us to look critically at every aspect of how we plan, procure, execute and manage every project under our jurisdiction, and how we align every dollar the taxpayers provide to achieving environmental cleanup goals.

On the subject of our management practices, I want to thank the Committee for facilitating our collaboration with the National Academy of Public Administration (NAPA). In September 2005, Congress asked NAPA to undertake a management review of EM, including an assessment of EM's human capital. NAPA's study, conducted over a period of 18 months, was very interactive; we opened our operations to NAPA for scrutiny and in turn have embraced and implemented nearly all of NAPA's proposals.

Most of all, we were gratified that NAPA concluded in its final report issued this past December that EM, "is on a solid path to becoming a high-performing organization." We know we have much remaining to be accomplished, but we take NAPA's conclusion as a sign that we are, in fact, headed in the right direction with regard to how we function as an organization.

A budget is only as good as its planning basis. Our request is developed from our project baselines that define the scope, cost, and schedule for each project, and I have much to report to you in this area. When I assumed this position, I was concerned that the accepted baselines for many of our projects were unrealistic. The reasons for this included overly aggressive assumptions in the technical and regulatory arenas, increasing costs of materials and simple underperformance.

Since that time, our sites have undergone an independent review to verify the reasonableness of the scope, cost, and schedule for each project. This review also documented assumptions and associated risk management plans that supported baseline development. As a result, all near-term baselines up to five years have now been independently reviewed and verified, while long-term cost ranges have been determined to be reasonable. As we move forward in the FY 2009 budget process, I believe that the Subcommittee can view near-term cost assumptions associated with our projects with greater confidence than ever before.

The majority of EM sites do, in fact, include baselines with completion dates beyond 2013. Through a collaborative process with our field sites, EM is seeking to define aggressive but achievable strategies for accelerating cleanup of distinct sites or segments of work that involve multiple sites. Moreover, it is important to note that EM's site cleanup activities are managed as one integrated *national* program; the work and risks associated with each site are inherently interrelated with that at other sites. Thus, we continue to evaluate and implement cross-site risk priorities and cleanup activities.

In 2005, we set out to integrate proven project management tools into our business processes, and address our shortcomings in project management by using DOE and industry-standard business management tools. I stated to you in 2006 that our goal was for at least 90 percent of our projectized portfolio to perform on-target, or better than on-target regarding cost and schedule. I am pleased to report that we now consistently meet that goal—in excess of 90

percent of our portfolio, currently numbering more than 65 independently audited projects, consistently performs within cost and schedule targets.

As an "acquisition" organization, EM accomplishes its mission through procurement and execution of our projects. Since the contract serves as the principal agreement governing how a project is executed between DOE and the contractor, contract and project management must be seamlessly managed in parallel. To oversee this process, about 18 months ago, we implemented an organizational structure, including the creation of a Deputy Assistant Secretary for Acquisition and Project Management. This position integrates the two functions of procurement planning and project management, helping us to professionalize the procurement process so that we learn from, and improve upon, each contract experience. Moreover, it provides us with strong management oversight after the contract is awarded. We are striving to make EM nothing short of a "Best-in-Class" organization for project and contract management and engineering and technology.

The FY 2009 Technology Development and Deployment Program will be highly focused and concentrate its investments in EM high priority cleanup areas, including radioactive tank waste, soils and groundwater remediation, and deactivation and decommissioning excess facilities. Best-in-class performers, including other Federal agencies, the national laboratories, the university system, and private industry will be utilized to conduct the Technology Development and Deployment scope.

The EM program has always required a strong technology component to accomplish its mission, one that is focused on developing and deploying technologies to enhance safety, effectiveness, and efficiency. As we look ahead to our cleanup work, we face the ongoing challenge of maturing and integrating technology into first-of-a-kind solutions. An Engineering and Technology Roadmap has been developed to address this need. The Roadmap identifies the technical risks the EM program faces over the next ten years, and strategies to address the risks. EM's validated baselines are a powerful tool that allows EM managers to identify the points at which new knowledge and technology can be efficiently inserted into EM cleanup projects to address risks.

## BUDGETING FOR OUR PRIORITIES

Before I discuss the FY 2009 budget request, allow me to draw attention to the significant cleanup progress achieved recently. We have:

- Completed stabilization and packaging for all plutonium residues, metals, and oxides and begun consolidation of all of these materials at the Savannah River Site (SRS);
- Produced for disposition more than 2,500 cans of vitrified high-level waste from highly radioactive liquid wastes;
- Completed retrieval and packaging for disposal of more than 2,100 metric tons of spent nuclear fuel from K-basins at Hanford to protect the Columbia River;
- Shipped more than 50,000 cubic meters of transuranic (TRU) waste from numerous sites to the Waste Isolation Pilot Plant (WIPP) for permanent disposal, including 25,000 out of a planned 30,000 drums from SRS;

- Disposed of nearly one million cubic meters of legacy low-level waste and mixed low-level waste;
- Eliminated 11 of 13 high-risk material access areas through material consolidation and cleanup;
- Cleaned up the Melton Valley area at the Oak Ridge Reservation and continued decontamination and decommissioning of three gaseous diffusion buildings at Oak Ridge; and
- Disposed of more than 8,500 tons of scrap metal from Portsmouth.

The program has made significant progress in shifting focus from risk management to risk reduction. This focus on measurable risk reduction continues to be the guiding principle behind the development of our FY 2009 budget request.

To strike the balance that allows EM to continue achieve risk reduction and pursue cleanup goals, we propose funding the following risk reduction and regulatory activities in priority order:

- Stabilizing radioactive tank waste in preparation for treatment (about 32 percent of the FY 2009 request);
- Storing, stabilizing, and safeguarding nuclear materials and spent nuclear fuel (about 18 percent of the FY 2009 request);
- Disposing of transuranic, low-level, and other solid wastes (about 14 percent of the FY 2009 request); and
- Remediating major areas of EM sites, and decontaminating and decommissioning facilities (about 26 percent of the FY 2009 request).

FY 2009 BUDGET REQUEST

The Department's FY 2009 budget request for the Office of Environmental Management is $5.528 billion. The request consists of three appropriations, Defense Environmental Cleanup, Non-Defense Environmental Cleanup, and the Uranium Enrichment Decontamination and Decommissioning Fund.

For FY 2009, EM's funding priorities to best address our environmental cleanup challenges are:

- Conducting cleanup with a "Safety First" culture that integrates environment, safety and health requirements, and controls into all work activities to ensure protection to the worker, public, and the environment;
- Establishing a disposition capability for radioactive liquid tank waste and spent nuclear fuel;
- Securing and storing nuclear material in a stable, safe configuration in secure locations to protect national security;
- Transporting and disposing of transuranic and low-level wastes in a safe and cost-effective manner to reduce risk;
- Remediating soil and groundwater in a manner that will assure long-term environmental and public protection; and

- Decontaminating and decommissioning facilities that provide no further value to reduce long-term liabilities while remediating the surrounding environment.

Examples of milestones and planned activities for FY 2009 by site-specific categories are:

Idaho

- *Meet requirements in the Idaho Settlement Agreement to ship stored contact-handled and remote-handled transuranic (TRU) waste to the Waste Isolation Pilot Plant (WIPP).*

  The Idaho National Laboratory will continue characterizing, treating, packaging, and transporting of contact-handled and remote-handled TRU waste to WIPP.

- *Continue construction of the sodium-bearing waste treatment facility to support tank waste retrievals.*

  The overall objectives of this project are to treat and dispose of sodium-bearing tank wastes, close the tank farms tanks, and perform initial tank soil remediation work. Construction and operation of the sodium-bearing waste treatment facility will reduce potential risk to human health and the environment by preventing the potential migration of contamination into the Snake River Plain Aquifer, which is a sole-source aquifer for the people of Southeastern Idaho.

- *Complete the transfer of all EM-managed spent nuclear fuel to dry storage.*

  EM will continue to promote the safe and secure receipt and dry storage of spent fuel to protect the Snake River Plain Aquifer.

Los Alamos National Laboratory

- *Promote soil and water remediation.*

  The Los Alamos National Laboratory (LANL) Soil and Water Remediation Project scope includes identification, investigation, and remediation of chemical and or radiological contamination attributable to past Laboratory operations and practices. In order to support the project scope, in FY 2009 EM plans to: complete required groundwater monitoring within eight watersheds, install four regional aquifer monitoring wells, complete four soil cleanups, including Material Disposal Area R in Technical Area-16, and continue remediation of tanks at the Material Disposal Area A in Technical Area-21.

- *Continue TRU waste shipments to WIPP.*

  The Solid Waste Stabilization and Disposition Project includes the treatment, storage, and disposal of legacy TRU and mixed low-level waste generated between 1970 and 1999 at LANL. The end-state of this project is the safe disposal of legacy waste from LANL. In FY 2009, EM plans to continue characterization and certification of TRU

waste for shipment to WIPP and continue services and safety-related activities to maintain the waste inventories in a safe configuration and within allowable Material-at-Risk limits established for the site.

Moab

- *Complete necessary transportation upgrades and tailings handling infrastructure and initiate movement of uranium tailings off the Moab site.*

  The relocation of the mill tailings at the Moab site to a Department of Energy constructed disposal facility near Crescent Junction, Utah, is necessary. In FY 2009, Moab plans to complete the rail upgrades between Moab and Crescent Junction and begin transporting tailings to Crescent Junction from Moab. Moreover, the Record of Decision has been amended to allow the tailings to be transported by either truck or rail. Also, Moab will continue disposal cell excavation at Crescent Junction.

Oak Ridge

- *Continue decontamination and decommissioning (D&D) of K-25 Process Building.*

  The gaseous diffusion plant comprises of one of the largest complex of buildings in the world. In FY 2009, EM will continue to vent, purge, and drain, characterize, remove of high risk equipment and carry out required foaming activities for the east and north wings of the K-25 process building. Demolition of the west wing of the K-25 process building will be conducted.

- *Complete final design for the Uranium-233(U-233) down-blending project and begin Building 3019 modifications.*

  The U-233 inventory in Building 3019 will be down-blended as expeditiously as possible to reduce the substantial annual costs associated with safeguards and security requirements and to address nuclear criticality concerns raised by the Defense Nuclear Facilities Safety Board (DNFSB).

- *Process and ship contact-handled and remote-handled TRU waste to WIPP.*

  Approximately 300 cubic meters of contact-handled TRU debris and 100 cubic meters of remote-handled TRU debris will be processed for disposal at WIPP.

- *Decontaminate and decommission (D&D) the Y-12 National Security Complex and Oak Ridge National Laboratory (ORNL).*

  Remediation of the Corehole 8 plume at ORNL and of mercury contamination at Y-12 will be performed. The on-site disposal cell for receipt of D&D debris and cleanup waste will be expanded.

Paducah

- *Initiate operations of the Depleted Uranium Hexafluoride (DUF6) Conversion Facility.*

  The DUF6 conversion facility will convert depleted uranium hexafluoride into a more stable form, depleted uranium oxide, which is suitable for reuse or disposition. The depleted uranium oxide will be sent to a disposal facility or reused, the hydrogen fluoride by-products will be sold on the commercial market, and the empty cylinders will be disposed of or reused.

- *Complete disposition of legacy waste.*

  The Paducah Gaseous Diffusion Plant is responsible for some of the waste streams that were generated by the United States Enrichment Corporation's operation of the Plant. The disposition of this legacy waste will reduce risk and storage costs and is critical to accelerating site cleanup.

- *Reduce risk through focused cleanup of soil and waste.*

  The completion of characterization and disposition of recently discovered soil and rubble piles along the river and closure and disposition of all DOE Material Storage Areas will also aid in lowering the risk to human health and the environment.

Portsmouth

- *Initiate operations of the DUF6 Conversion Facility.*

  Similar to Paducah, the DUF6 conversion facility will convert depleted uranium hexafluoride into a more stable form, depleted uranium oxide, for reuse or disposal. The depleted uranium oxide will be sent to a disposal facility or reused, the hydrogen fluoride by-products will be sold on the commercial market, and the empty cylinders will be disposed of or reused.

- *Complete cold shutdown activities in the former gaseous diffusion operations facilities and award the D&D contract.*

  The transition of the Gaseous Diffusion Plant from cold shutdown to decontamination and decommissioning will continue. In addition, Portsmouth plans to complete X-701B oxidation injection system groundwater field treatment activities.

Richland

- *Complete shipping of special nuclear materials from the Plutonium Finishing Plant (PFP).*

The PFP complex consists of several buildings that were used for defense production of plutonium nitrates, oxides and metal from 1950 through early 1989. As part of the PFP cleanup, Richland's goal is to complete shipments of special nuclear materials off-site to the Savannah River Site and procure additional casks to support completion of the shipping campaign by the end of FY 2009.

- *Enhance groundwater remediation at the Central Plateau and along the Columbia River.*

  Over 50 years of weapons production at the Hanford site has left the groundwater contaminated by carbon tetrachloride, chromium, technetium 99, strontium, and uranium. EM is dedicated to protecting the groundwater resources at Hanford as well as the Columbia River, through deployment of innovative technologies in FY 2009 to address all of the contaminants in the vadose zone and groundwater, with supporting investigations such as installation of new wells for monitoring and characterization, and geophysical logging to provide additional subsurface information on contaminant distribution.

- *Cleanup of waste sites and facilities along the Columbia River Corridor including K-East Basin D&D.*

  The K Basins project is a high priority risk reduction activity due to its close proximity to the Columbia River. To date, we have completed the removal, packaging, and transportation of approximately 2,100 metric tons of degrading spent nuclear fuel, removal of an estimated 44 cubic meters of radioactively contaminated sludge, and the basin water is now being pumped out. In FY 2009, the K-East basin will be completely demolished. The end-state of the K Basins cleanup will mean the removal of more than 55 million curies of radioactivity from near the Columbia River.

- *Retrieve suspect contact-handled and remote-handled TRU waste from burial grounds and continue to ship to WIPP.*

  The Hanford Site contains thousands of containers of suspect contact-handled and remote-handled TRU waste, low-level waste, and mixed low-level waste. Activities planned in FY 2009 are to retrieve 1,100 cubic meters of suspect contact-handled and remote-handled TRU waste from the low-level burial grounds, continue certification of transuranic waste, and dispose of on-site generated low-level and mixed low-level wastes at the mixed waste disposal trenches.

<u>River Protection</u>

- *Manage the tank farms in a safe and compliant manner until closure.*

  The radioactive waste stored in the Hanford tanks was produced as part of the nation's defense program and has been accumulating since 1944. To protect the Columbia River, the waste must be removed and processed to a form suitable for disposal and the tanks must be stabilized. To reach these goals, EM plans to enhance the Single-Shell Tank

Integrity Program, continue to develop retrieval technologies and retrieve waste from approximately one tank per year, and continue to evaluate supplemental treatment technology, and interim pre-treatment capabilities.

- *Advance in Waste Treatment and Immobilization Plant construction.*

  The Waste Treatment and Immobilization Plant (WTP) is critical to the completion of the Hanford tank waste program by providing the primary treatment capability to immobilize the radioactive tank waste at the Hanford Site. The WTP complex includes five facilities: the Pretreatment Facility, the High-Level Waste Facility, the Low-Activity Waste Facility, the Balance of Facilities, and the Analytical Laboratory. In FY 2009, EM plans to continue construction of all of these facilities to achieve approximately 55 percent completion, while maintaining the viability of other supplemental treatment options. The end-state of this project will be the completion of the WTP hot commissioning and transfer of the facilities to an operations contractor to run the plant.

Savannah River

- *Continue consolidation and disposition of special nuclear materials.*

  The receipt, storage, and disposition of materials at the Savannah River Site allows for de-inventory and shutdown of other DOE complex sites, providing substantial risk reduction and significant mortgage reduction savings to the Department. In FY 2009, the Savannah River Site will complete the receipt of surplus plutonium from the Hanford Site, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory. Also in FY 2009, EM plans to operate H-Canyon/HB-Line to disposition special nuclear materials and begin processing of Savannah River Site's spent nuclear fuel in H-Canyon.

- *Reduce radioactive liquid waste.*

  The mission of the tank waste program at Savannah River is to safely and efficiently treat, stabilize, and dispose of approximately 37 million gallons of legacy radioactive waste currently stored in 49 underground storage tanks. In FY 2009, planned EM activities include: continue operation of Actinide Removal Project, Modular Caustic-Side Solvent Extraction Unit, and the Defense Waste Processing Facility, continue the construction of the Salt Waste Processing Facility; and prepare sludge batches in support of continued high-level waste vitrification. Activities are planned to free up additional tank space, such as treatment of organic waste in the 1.3 million gallon Tank 48 to return the tank to useful service.

Waste Isolation Pilot Plant

- *Continue safe shipment, receipt, and disposal of contact-handled and remote-handled TRU waste.*

WIPP in Carlsbad, New Mexico, is the nation's only mined geologic repository for the permanent disposal of defense-generated TRU waste. In FY 2009, the budget request supports up to 21 contact-handled TRU and up to 5 remote-handled TRU shipments per week from across the DOE complex.

## CONCLUSION

Mr. Chairman, I am proud of the progress the EM program has made in recent years, both in terms of meeting the nation's cleanup priorities, and in building the foundation for future efforts. I respectfully submit EM's FY 2009 budget request and am pleased to answer your questions.

Mr. VISCLOSKY. Mr. Owen.

MR. OWEN'S OPENING STATEMENT

Mr. OWEN. Good afternoon, Mr. Chairman and other members of the committee.

My name is Michael Owen, and I am the Director of the Office of Legacy Management at the Department of Energy. The Office of Legacy Management is responsible for ensuring that DOE's closure responsibilities are met by providing long-term surveillance and maintenance, records management, workforce restructuring and benefits continuity, property management and land-use planning.

By managing post-closure responsibilities, LM has better positioned the department to continue focusing DOE programs and personnel on achieving the diverse missions of the Department.

For fiscal year 2009, the President's request for LM activities is just under $186 million, a reduction of approximately $8 million from the fiscal year 2008 request. In the past, LM was funded by Other Defense Activities, ODA appropriations, and through fiscal year 2007, by the Energy Supply and Conservation, ES&C appropriation.

However, in fiscal year 2008, a new appropriation account for Legacy Management was created and placed a portion that had previously been within ES&C into the Legacy Management, labeled as Legacy Management. In fiscal year 2009, funding is being requested only under ODA appropriation.

I would now like to take this opportunity to explain briefly our fiscal year 2009 budget request from the perspective of LM's four strategic goals. Strategic goal number one, protect human health and the environment through effective and efficient long-term surveillance and maintenance. For the long-term surveillance and maintenance program, total funding request for fiscal year 2009 is $48 million.

This request will allow Legacy Management to monitor and conduct long-term management in accordance with legal, contractual and regulatory agreements at 86 sites plus eight additional sites that are planned to be transferred to LM in fiscal year 2009. This request includes $8.5 million for long-term surveillance and maintenance at the Fernald site in Ohio and $5.5 million for activities at the Rocky Flats site in Colorado, two of our larger closure sites.

We are also requesting $15 million to monitor and conduct normal long-term surveillance and monitoring activities at the eight Nevada off-sites, located mostly in western states, which includes scheduled drilling of deep groundwater monitoring wells. Monitoring wells at these sites are very costly because nuclear tests were conducted at extreme depths in order to minimize surface impacts. Placement of wells around these sites is decided upon after consultation with state regulatory authorities.

Strategic goal two is to preserve, protect and make accessible legacy records and information. In fiscal year 2009, Legacy Management is requesting just over $9 million for archives and information management programs. The increased funding levels for archives and information management includes costs associated with preparing to consolidate all of our archived records into one facility.

These records are currently located in five different federal records centers scattered across the country, and consist of records for all of our sites, as well as the eight new sites that are coming to our control in fiscal year 2009. With the planned lease of a new records facility, these records will be transferred to a single records storage facility in fiscal year 2010.

Goal three, support an effective and efficient workforce structured to accomplish departmental missions and ensure contractor-worker pension and medical benefits. The largest single portion of the Legacy Management budget for fiscal year 2009 funds the pensions and benefit continuity program. The total request for this program is $112 million. This funding allows the department to make the required Employment Retirement Income Security Act, ERISA, minimum pension fund contributions and provide post-retirement benefits of medical, Medicare Part B, and life insurance to contractor retirees at LM closure sites.

Our final goal, manage legacy lands and assets, emphasizing protective, real and personal property reuse and disposition. LM is requesting approximately $4 million for reuse of property management programs. Legacy Management is also charged with the transfer or reuse of sites that no longer support an ongoing departmental mission and possible disposal of properties for beneficial reuse.

The Office of Legacy Management manages thousands of acres of land and other assets. When land is transferred to a private interest, it allows the land to be reused productively, reduces the department's footprint, and resumes payment of local property taxes.

Finally, the president's budget for fiscal year 2009 requests just over $1 million to fund all of DOE's Environmental Justice program, an increase of about $400,000 from last year's request. The additional funding will expand our environmental justice outreach activities more into the southwestern part of the country, and allow for better outreach to Native American and Hispanic communities in that area where the department has a large footprint.

In conclusion, you can see from the President's fiscal year 2009 budget request that the Office of Legacy Management is taking proactive steps to increase our efficiency and effectiveness by consolidating funds from other appropriations accounts, and more importantly using prior-year funds from previously appropriated funding to reduce our fiscal year 2009 budget request, while fully meeting our commitments.

As the second office in the entire federal government to receive official designation from OMB as a High-Performing Organization, LM's fiscal year 2009 budget request continues our commitment to make prudent use of taxpayer dollars.

Thank you, Mr. Chairman and members of the committee. I would be glad to answer any questions you may have.

[Statement of Michael Owen, Director, Office of Legacy Management follows:]

STATEMENT OF

MICHAEL W. OWEN
DIRECTOR, OFFICE OF LEGACY MANAGEMENT
DEPARTMENT OF ENERGY

BEFORE THE

SUBCOMMITTEE ON ENERGY AND WATER
COMMITTEE ON APPROPRIATIONS
UNITED STATES HOUSE OF REPRESENTATIVES

MARCH 6, 2008

Good morning Mr. Chairman, and distinguished Members of the Committee. My name is Michael Owen, and I am the Director of the Office of Legacy Management (LM) at the Department of Energy (DOE). The Office of Legacy Management is responsible for ensuring that DOE's post-closure responsibilities are met by providing long-term surveillance and maintenance, records management, workforce restructuring and benefits continuity, property management, and land use planning. By managing post-closure responsibilities, LM has better positioned the Department to continue focusing DOE programs and personnel on achieving the diverse missions of the Department, including assisting the Environmental Management program (EM) to concentrate its efforts on cleanup and risk reduction.

### *LEGACY MANAGEMENT MISSION AND VISION*

LM's mission is to manage the Department's post-closure responsibilities and ensure the future protection of human health and the environment. LM manages the Departmental legacy responsibilities in a manner that best serves Department workers, communities, and the environment. This vision includes several elements:

- Human health and the environment are protected at closed sites, through effective environmental surveillance and maintenance. This often involves cooperative partnerships with stakeholders and State, Tribal, and local governments;
- Key records and critical information are preserved, protected and made publicly accessible;
- Effective oversight and management of health and pension benefits of the Department's former contract workforce, who have been instrumental to the success of our missions; and
- Federal land and other assets are returned to the most beneficial use consistent with the Department's mission requirements.

### *FISCAL YEAR 2009 REQUEST TIED TO DOE AND LM STRATEGIC GOALS*

The Office of Legacy Management has an important role within the Department of Energy. LM supports implementation of the Department's Strategic Plan and has responsibility under Strategic Theme 4, Environmental Responsibility. Specifically, LM has responsibility for goal 4.2, Managing the Legacy. For Fiscal Year (FY) 2009, the President's request for LM activities is just under $186 million, a reduction of approximately $8 million from the FY 2008 budget request.

In the past, LM was funded by the Other Defense Activities (ODA) Appropriation and, through FY 2007, by the Energy Supply and Conservation (ES&C) Appropriation. However, in FY 2008 a new appropriation account "Legacy Management" was created and replaced the portion that had previously been within ES&C. In FY 2009 funding is being requested only under the ODA Appropriation. This shift is because, following remediation, the distinction between ODA and ES&C sites becomes negligible and, after transferring the closure sites of Rocky Flats and Fernald in FY 2008, the portion of the budget that would have been within the Legacy Management (formerly Energy Supply and Conservation) appropriation had decreased to less than 20 percent of the total budget request. I would now like to take this opportunity to explain our FY 2009 budget request from the perspective of LM's four strategic goals.

***LM GOAL 1: PROTECT HUMAN HEALTH AND THE ENVIRONMENT THROUGH EFFECTIVE AND EFFICIENT LONG-TERM SURVEILLANCE AND MAINTENANCE***

The Department's environmental legacy responsibilities stem primarily from the activities of the Department and predecessor agencies, particularly during World War II and the Cold War. For the Long Term Surveillance and Maintenance program, the total funding request for FY 2009 is $48 million. This request will allow LM to monitor and conduct long-term treatment in accordance with legal, contractual, and regulatory agreements for 86 sites plus eight additional sites planned for transfer by the end of FY 2009. Functions include soil, water, and air monitoring, long-term treatment of contaminants, maintenance of contaminant treatment structures, and maintaining security for the sites and other resources associated with the sites. This request includes $8.5 million for long term surveillance and maintenance activities at the Fernald Site and $5.5 million for activities at the Rocky Flats Site.

We are also requesting $15 million to monitor and conduct normal long term surveillance and monitoring activities at the eight Nevada off sites - mostly located in the Western States - which includes scheduled drilling of deep groundwater monitoring wells. Monitoring wells at these sites are very costly because the nuclear tests were conducted at extreme depths in order to minimize surface impacts. The placement of wells around these sites is decided upon after consultation with State regulatory authorities. The wells must be within deep aquifers and/or natural gas formations which have the potential to be impacted by radioactive contaminants from the nuclear tests.

***LM GOAL 2: PRESERVE, PROTECT, AND MAKE ACCESSIBLE LEGACY RECORDS AND INFORMATION***

In FY 2009, LM is requesting just over $9 million for the Archives and Information Management (AIM) program. This activity provides records management services for LM's active program elements and maintains legacy archives of inherited collections. The archives and information management activity includes managing records over the standard record life-cycle and developing records retention schedules in conjunction with National Archives and Records Administration (NARA) requirements. These functions encompass operational records retention, records maintenance and use, records disposition processes and activities to ensure proper documentation of LM's environmental protection, environmental remediation, and hazardous waste disposition related policies and activities. The activity supports DOE stakeholders by processing claims associated with the Energy Employees Occupational Illness Compensation Program Act, Freedom of Information Act, Privacy Act and other information requests. The AIM program also provides LM's information management and technology needs to include planning, design and maintenance of the infrastructure and all aspects of information security. Additionally, the program includes funds to support the national and intergovernmental stakeholder activities such as technical libraries, public reading rooms, and educational outreach development.

In FY 2009, the increased funding levels for the AIM program include costs associated with preparing to consolidate archived records into one facility. Currently, these records are located within five Federal Records Centers and consist of records for all 86 of LM's current sites as well as the eight additional sites coming to LM in FY 2009. With the planned lease of the new records facility, these records will be transferred to a single records storage facility in FY 2010.

***LM GOAL 3: SUPPORT AN EFFECTIVE AND EFFICIENT WORK FORCE STRUCTURED TO ACCOMPLISH DEPARTMENTAL MISSIONS AND ASSURE CONTRACTOR WORKER PENSION AND MEDICAL BENEFITS***

The largest portion of the LM budget for FY 2009 funds the Pensions and Benefit Continuity program. The total request for this program is $112 million, a decrease of just over $15 million from FY 2008. However, LM reduced its requirement by more than $18 million due to the availability of prior year funds. Because this program contains a significant portion of LM's overall budget, I would like to provide more detail on the pension and benefit costs at specific sites.

The request for the Rocky Flats site is just over $86 million in FY 2009. This funding will allow the Department to make the required Employment Retirement Income Security Act (ERISA) minimum contribution to the pension fund for retired contractor personnel and provide post-retirement benefits of medical, Medicare Part B, and life insurance to

contractor retirees. The FY 2009 funding request for pension and benefits at Rocky Flats is reduced because LM will use approximately $10.7 million in FY 2006 carryover funds originally appropriated for a National Stewardship Contractor (NSC) to administer pension and benefit distribution. These funds are available because that approach was cancelled and an alternative system is being utilized.

At the Fernald site, $10.2 million is requested to provide ERISA required contributions to the pension funds and post-retirement benefits (medical and life insurance) for former contractor retirees, a decrease of $3 million from FY 2008. The decrease in funding reflects a reduction in pension costs. The reduction is due to a number of plan participants choosing to receive a lump sum settlement.

We are requesting $5.1 million to provide required contributions to the pension funds and post-retirement benefits (medical and life insurance) for former contractor retirees from the Pinellas Plant. Again, this funding request is reduced because LM will use approximately $1 million from carryover of appropriations from prior fiscal years.

LM is also responsible for providing benefits for activities and expenses associated with post-retirement life insurance and medical benefits at two United States Enrichment Corporation (USEC) Facilities, Paducah and Portsmouth. The costs for medical benefits have been increasing at a rate greater than the overall inflation rate. However, during FY 2009, the funding need of approximately $16 million for these facilities will be partially met with approximately $6 million in appropriations carried over from FY 2007. Therefore, LM is only requesting $9.7 million in FY 2009. Despite the inflation in medical costs, using carryover funding will reduce the need for new appropriated funds while still meeting the Department's commitments.

### *LM GOAL 4: MANAGE LEGACY LANDS AND ASSETS, EMPHASIZING PROTECTIVE REAL AND PERSONAL PROPERTY REUSE AND DISPOSITION*

LM is requesting approximately $4 million for the Reuse and Property Management Program. Legacy Management is also charged with the transfer or reuse of sites that no longer support an ongoing Departmental mission and possible disposal of properties for beneficial reuse. As such, LM works with other agencies and organizations to transfer real property from the Department, and supports other Departmental elements in reviewing transition plans and closure plans to facilitate the transfer of real and personal property assets to other agencies, private organizations, or private interests. The Office of Legacy Management manages thousands of acres of land and other assets. When land is transferred to a private interest, it allows the land to be reused productively, reduces the Department's "footprint," and resumes payment of local property taxes.

*ENVIRONMENTAL JUSTICE PROGRAM*

Finally LM's FY 2009 budget requests just over $1 million to fund the Environmental Justice program, an increase of about $400,000 from last year's request. This important program allows the Department to promote environmental justice as specified by Executive Order 12898, issued on February 11, 1994. The Environmental Justice program provides assistance for a variety of activities that include: grants to communities to address environmental issues using expertise from Historically Black Colleges and Universities (HBCUs) and Minority Serving Institutions (MSIs); an intern program through the United Negro College Fund; working relationships with small towns, stakeholders, Tribal and local governments on environmental issues; and a Community Capacity Building Program to provide assistance to enable communities around DOE sites to address environmental issues. The additional funding will expand activities in the Southwest and establish an intern program for Native Americans and Hispanics.

*CONCLUSION*

In closing, as you can see from the President's FY 2009 budget request, the Office of Legacy Management is taking proactive steps to increase our efficiency and effectiveness by consolidating funds in one appropriations account and more importantly, using carryover funds from previously appropriated funding to reduce our FY 2009 budget request while fully meeting our commitments. As the second office in the entire Federal Government to receive designation by the Office of Management and Budget (OMB) as a High Performing Organization, LM's FY 2009 budget request continues our commitment to make prudent use of taxpayer dollars.

Mr. Chairman and distinguished Members of the Committee, this concludes my statement.

Mr. VISCLOSKY. Thank you very much.
Mr. Hobson.
Mr. HOBSON. Thank you, Mr. Chairman.

IDAHO TRANSURANIC CLEANUP

I have a couple of comments on something first, then I have a long question. This map, I am pleased to see this map. This was a priority of this committee. It should have been a priority of everybody before you and everybody else. If this doesn't work, this is a world catastrophe waiting to happen. I know the state wants to take credit for it, but it was really this committee that kick-started the program.

If the river there becomes contaminated to the degree that it could, you would have something you couldn't fix. It would destroy a whole ecosystem and people's lives would be at risk. I view this as one of your most critical programs that you have to watch and maintain and do. I am pleased to see the progress on it.

That is enough said about that, but I am pleased to see the map and pleased to see the response, because this is something that I used to wake up at night worrying about. It was on our watch, we couldn't really fix it, and pump-and-treat didn't work. I commend you for getting on that, and I hope whoever follows you at the department understands the potential world-problem-class catastrophe of what would happen if this vital river becomes contaminated.

Mr. RISPOLI. And I thank you because I recall our past conversations. I know you have discussed it with our secretary. I know that you have plussed-up our money one year. We have this year added another $65 million on top of $104 million from last year, and we do recognize it and I do appreciate that. I would hope that this will continue because this is the real and present danger out there right now.

Mr. HOBSON. It is one of the major problems in this country, the waste that is life-threatening if it happens.

Mr. RISPOLI. Yes, sir.

EM-WIDE NATIONAL MASTER DISPOSITION PLAN

Mr. HOBSON. At the secretary's hearing, we questioned why the department does not have a nationwide "master plan" showing the types, quantities, schedule and final disposition for all materials intended for consolidation and disposal. These would be the radioactive waste resulting from your cleanup activities, as well as special nuclear materials that are being consolidated for security, safety or economic reasons.

Offices like Environmental Management and NNSA offer us their piecemeal plans for moving material and cleaning up sites, but no one has shown us the master plan or "road chart" that shows how all these pieces fit together. In particular, I have concern that EM is making promises to clean up certain sites on the assumption that all of the high-level waste will go to Yucca Mountain for disposal. But the repository does not have the authorized capacity to accept all the high-level waste in the DOE complex.

My questions, and I am going to read them separately, does Environmental Management have such a nationwide master plan, or

at least a nationwide plan, that shows the types, quantities and scheduled shipment dates for all the EM materials?

Mr. RISPOLI. We have something called a disposition map that is actually a book, Congressman Hobson. It does show that where there is no firm disposition path, it so notes, but for the most part it actually shows the disposition path for all the various types of waste. I would also mention that our Deputy Assistant Secretary Frank Marcinowski has developed this with his staff. It has been discussed with many stakeholders that are affected in those areas. It does exist. It is a living document. In other words, it doesn't have a date or a sit-on-a-shelf.

Mr. HOBSON. Is this information available? First of all, is that DOE-wide?

Mr. RISPOLI. Yes, sir.

Mr. HOBSON. Or just EM?

Mr. RISPOLI. It is the entire—no, I am sorry, sir. It is EM-wide. It is for the EM complex, but it is all nationwide for the EM complex.

Mr. HOBSON. Is this information available in a format that you can provide for this hearing record? If not, can you provide it in a summary format, including the nationwide part of it showing this information graphically for the record?

Mr. RISPOLI. Yes, sir, we can.

EM-WIDE MASTER DISPOSITION PLAN

The Office of Environmental Management has complex-wide disposition maps for the various waste types resulting from our cleanup programs. The data are derived from our project baselines, provide life cycle estimates, and are updated annually. The Waste Information Management System (WIMS), which generates life-cycle disposition maps through 2050 for low-level and mixed low-level radioactive waste, is available on the Internet (http://wims.arc.fiu.edu/WIMS/) and is maintained by Florida International University. These WIMS disposition maps identify: The waste type generator site, physical form, projected volumes, the general type of treatment required, and the disposal facility. Wastes that do not have a current disposition facility are labeled "To Be Determined." DOE sites and Headquarters organizations work together to establish final treatment and disposal paths for these wastes and monitor capacity of existing disposal sites. Later this year we will add transuranic waste data to this system. We will provide a folder with these disposition maps.

Mr. HOBSON. Which office, if any, in DOE is charged with integrating all these different moving pieces from the various DOE programs—treatments on-site, shipment-off-site and receipt of waste and spent fuel for disposal?

Mr. RISPOLI. If we are talking about wastes that are in the Environmental Management program, then the Deputy Assistant Secretary Frank Marcinowski and his office are responsible for that. The Department still employs for non-waste, but for nuclear materials such as plutonium, uranium, a consolidation committee, a nuclear materials consolidation committee. It is presently chaired by Mr. Bill Ostendorff. It used to be chaired by Charlie Anderson. It is now chaired by Bill Ostendorff, who is the principal deputy administrator of the NNSA. They handle those materials that are not waste, but might have a future benefit or a present benefit for the nation.

Mr. HOBSON. I think what we are concerned about is seeing an integrated plan for the Department as a whole. We need to talk to the staff and everybody. One, we want to know that there is such

a plan. Second we think there could be some efficiencies if there is an overall plan, instead of a hit-or-miss approach as you move through that.

MOUNDO OU–1 CLEANUP STATUS

If I have any further time, I am going to switch to somewhat of a parochial thing, but it is not really in my district. Both Congress and your department have put additional funding toward cleaning up the contamination at OU–1 at the Mound site in Miamisburg, Ohio. I gather the local community still believes the Department has not done enough and is seeking even more federal funding for this site. Can you explain the current status of the OU–1 cleanup and how the department proposes to resolve that problem?

Mr. RISPOLI. Yes, Mr. Hobson. There are two issues that are related to this. The first is, the Department has offered to convey the property minus the OU–1 area that is of concern to the community and that dialogue is ongoing with the community now. In fact, I believe that we are well along the path toward executing such an agreement once it is finalized. So that would remove that particular property from the transfer to the community.

However, related to the cleanup, I was aware of the concern. You know, this committee gave us $30 million to——

Mr. HOBSON. And you know why. There was a signoff by a couple of people that everything was okay, and I didn't believe it was okay. And guess what? It wasn't okay. We would have left a mess for the community. We had the money, and frankly, the staff came and said we don't think this thing is cleaned up. This was even though the Ohio EPA signed off and I don't know who else signed off.

Mr. RISPOLI. The federal and the Ohio——

Mr. HOBSON. Yes, but let me tell you, what did you find? They had stuff.

Mr. RISPOLI. Yes, sir.

Mr. HOBSON. And we would have all walked away from that site and left it right over an aquifer if this committee and its staff hadn't said, whoa, wait a minute.

Let me ask another question on this to Mr. Owen. What is the status of the department's payments to the Miamisburg Mound Community Improvement Corporation? Does DOE still owe any further money to the community organization? Is the community organization using the DOE funds that they have received to date?

Mr. OWEN. Yes, sir. We owe them no additional monies. All the monies have been paid. The way the contractual procedures that are followed by the government, that is considered a grant. So the Miamisburg Mound Community Improvement Corporation would invoice against a balance there of approximately $6.1 million which is available to them, and we owe them no additional monies. We have made all payments.

Now, they may have to come in with matching grant requirements for the release of some of the funds, and that may still be going on. They have a master plan as to how they plan to develop the site.

Mr. HOBSON. But they claim that you haven't cleaned up this other little site.

Mr. RISPOLI. Yes, sir. They do.

Mr. HOBSON. And I don't know who is right or who is wrong on that, but I would like to get rid of that thing off our books one way or the other. It is so close to being done it ought to get done.

Mr. RISPOLI. I ought to give the Congress an update as to what was going on. I have asked the Army Corps of Engineers to take a look at what we have done so far, given the $30 million that you directed to it, and we added another $4.5 million, which is below all the reprogramming thresholds. I was informed informally today that we probably have removed with that about 60 percent of the quantities.

When I was first told of this issue several years ago, I was told that it was likely over $100 million problem, but nobody had really characterized it and nobody knew. But now we have removed 60 percent, but it took $34.5 million to do the 60 percent. The Army is working on a report for me to recommend what should we do, what did they think the costs would be for the balance. It is a protective option, Mr. Hobson to cap it as we do others, like at Fernald, where we have a cap over a landfill, or what should we do with it.

I expect that report within the next month or so.

Mr. HOBSON. I just worry about the groundwater.

Mr. RISPOLI. Yes, sir. I understand.

GUARANTEED FIXED PRICE REMEDIATION CONTRACTS

Mr. HOBSON. This committee directed DOE to explore the use of guaranteed fixed price remediation contracts for some of your cleanup work. Can you explain the results of any trials you have conducted to date?

Mr. RISPOLI. Yes, sir. We actually did provide a report to the Congress that was required as a result of that direction. The report mentioned about four or five different things that we looked into with respect to that issue, with respect to that type of contracting.

What it came down to was that there are a couple of candidates. There is a gun site at the Savannah River site. There are two reactors at Brookhaven and we believe that the SEFOR reactor at the University of Arkansas at Fayetteville would be candidates for it. However, with the budget we have, the Brookhaven reactors and the SEFOR, which was added to our program by an authorization act, actually by EPACT 2005, I am sorry, we don't have the funds to do anything with those right now.

In fact, we are slowing down the work in 2009 on the Brookhaven reactors and we have nothing other than perhaps spending some planning money to look at SEFOR at Fayetteville. So we have some potential candidates, but at the present time, in all honesty, they are not moving very far, but we are poised to take them on when the time is right.

PORTSMOUTH CLEANUP STRATEGY

Mr. HOBSON. Okay. My last question is on Portsmouth.

Mr. RISPOLI. Yes, sir.

Mr. HOBSON. Portsmouth, as they would say if you were there, sort of a southern Ohio twang in there.

The contract for the cleanup of the technetium 99 at Portsmouth should be completed sometime later this year. What is DOE's current strategy for cleaning up the rest of the Portsmouth site in addition to the DUF6 project?

Mr. RISPOLI. I am happy to tell you—well, the DUF6 project, of course, has its own place. I am sure that you or someone will have questions about the status. It is, as I mentioned, our one project that is listed as red. It is not on cost or on schedule at the present time.

On the larger front of the future D&D, I am happy to report to you that we are working in tandem, both the project management planning and the procurement planning, as I say, in parallel. We expect that this summer we will be approving both an acquisition strategy and a path forward so that we could package up an RFP and be able to do that work.

Mr. HOBSON. How are you going to deal with the hundreds of skilled employees that will become available once the Tech-99 contract is completed? Do you have any plan to keep these skilled cleanup workers usefully employed at the site, or what are you going to do?

Mr. RISPOLI. Mr. Hobson, I don't have an answer for that. I will have to take that for the record.

PORTSMOUTH WORKFORCE PLAN

Yes, currently the Office of Environmental Management (EM) has funded activities at the Portsmouth site which supports approximately 440 United States Enrichment Corporation (USEC) employees. About half of these employees support the Cold Shutdown of the Portsmouth Gaseous Diffusion Plant (PGDP) and the others are assigned to the Technicium-99 (Tc-99) cleanup program. On March 3rd, DOE initiated discussions with USEC to establish a contractual relationship for the support of Surveillance and Maintenance of the PGDP DOE owned facilities until the contract for the decontamination and decommissioning (D&D) of the facilities is awarded. At that time it will be the Department's intention to transition the USEC employees to this new D&D contractor.

The successful completion of the Tc-99 cleanup program is approaching. As this program nears completion the natural migration of the associated USEC employees to other deactivation projects at Portsmouth has already begun and will continue throughout the current fiscal year and into FY2009. In addition, DOE will approach USEC about using their employees to support the Depleted Uranium Hexafluoride ($DUF_6$) project and American Centrifuge Project (ACP), as the projects transition from construction to operations. A significant number of the USEC pool of experienced employees will be used to staff these projects. The natural attrition of USEC at the Portsmouth site is being closely managed to ensure that there is a minimal impact to the existing workforce during the transition of the plant to D&D.

URANIUM DISPOSITION SERVICES PERFORMANCE

Mr. HOBSON. And lastly on this, we asked the secretary several questions about the performance of the contractor, Uranium Disposition Services, LLC, for the depleted uranium hexafluoride projects at Portsmouth and Paducah. It sounds like the only consequence to the current contractor for his poor cost and schedule performance is that DOE may re-compete the operational phase for these projects.

Well, the question is, what will be the consequences to the current contractor in terms of reduced award fees?

Mr. RISPOLI. On that contract, it was initially one contract to build, commission and operate for I believe a total of 5 years that particular facility. As you know, we have given them both a cure

notice and then a second cure notice, and then a show cause, which is the step as a precursor to termination for default. We are now in dialogue with that contractor to remove, as you accurately conveyed, the operations part, which is a significant amount of work that would have been done with that plant.

That is the path we are on. And certainly, the contractor is not enjoying when we are in termination-type proceedings, they are not enjoying a significant or any fee payments for the work they are doing. They are behind schedule and over cost.

Mr. HOBSON. The Department of Commerce maintains a list of nonperforming contractors that agencies are supposed to review before making new contract awards. Will the department submit the UDS partnership or the individual members of that partnership as non-performing contractors? If not, please explain why not?

Mr. RISPOLI. Mr. Hobson, I do not know the criteria for submitting a contract that is nonperforming, so I will have to take one for the record.

NON-PERFORMING CONTRACTORS

The Office of Environmental Management (EM) collects and maintains information on contractor performance and routinely uses this information, as well as past performance information available from other sources, in making contract award decisions. EM inputs information on contractor performance to the National Institutes of Health Contractor Performance System (NIH CPS), an automated contractor performance information database. EM also uses the Past Performance Information Retrieval System (PPIRS) which is maintained by the Department of Defense, as a Government-wide contractor past performance repository. Following the completion and closeout of contracts such as the $DUF_6$ Contract held by UDS, performance information and supporting data that will be entered into NIH CPS is automatically downloaded into PPIRS; this information is captured and maintained for universal access by other Federal Acquisition Officials as needed in accordance with restrictions outlined in the Federal Acquisition Regulations.

Mr. HOBSON. I always worry about these contracts, although I don't know DOE contracts as well as I know defense contracts. In defense contracts, the government always—and I won't use the word that I would normally use—gets the short end on these things because they are written in such a way that we give performance awards to people that shouldn't get them.

They say, well, that is the way the contract is written. I have had deals where they say if you are terminated early, it costs the government more than if the contractor completed it. I hope we are not doing that here. I hope that DOE doesn't do that and your agency doesn't do it.

I look forward to your answers on this in a timely fashion while I am still here in Congress. Sometimes we don't get them for a long time, but I am sure you guys will do better.

Thank you very much, Mr. Chairman.

Mr. RISPOLI. Thank you.

Mr. VISCLOSKY. Ms. Emerson.

Mrs. EMERSON. Mr. Chairman, I just put a mint in my mouth. I apologize. I am ready now. [Laughter.]

NAPA STUDY

If I start coughing, forgive me. Thank you.

And thank you all so much for being here. Mr. Rispoli, your testimony mentioned the NAPA study that reviewed EM. I know this

report was just released in December, but can you update me and the rest of the committee on the recommendations you have already implemented? And also what near-term recommendations can we expect to be implemented in the next few months?

Mr. RISPOLI. Thank you. That panel has been extremely useful. They were I think pleasantly surprised that we did not wait for them to issue a final report, but actually worked with them every step of the way to begin implementing recommendations as we went.

We have taken some significant actions. For example, they recognized that our staffing, that if you looked across the complex, we were short in both numbers, but just as importantly, in skill mix. So we initiated an effort to do a nationwide review of the staffing across the complex. We used the Corps of Engineers to do that, by the way.

We then immediately plugged in 50 support people to help us to close the skill gaps. While we recruit, they recommended that we use our Cincinnati business office to do more of these functions. So we have done nationwide recruitments out of the Cincinnati business office so that we don't have to do them one at a time from each site, so that we can get faster and more professional expert help at all of these sites.

I think most importantly to us is, again, recognition that many of the shortcomings we have had have in fact been due to a shortfall in the right skills at the right places at the right time. If I had to pick any one thing, I think that is probably one of the more important.

They also helped us to restructure some of the organization at headquarters so that we at headquarters could be more responsive to the field. We took some of those actions. For example, we put all of our own environmental management personnel management in one office, as an example, instead of having it fragmented. We reorganized and created a new office to look at strategic issues, and that office now, not being a part of any other office, can look across the EM complex at strategic issues.

So they have done some things for us that really have assisted us greatly. I thank you for it, and I would say any other time that you need good expert help somewhere, these are the people to send for it.

Mrs. EMERSON. We need to send them to a lot more agencies in the government, it seems like.

So in the near term, are there some things that you are beginning to implement in accord with the recommendations?

Mr. RISPOLI. Absolutely. We have already begun, or in fact completed, I am given a monthly update on status. We have an executive who tracks that and actually manages the implementation so that we are not waiting for some future date. My objective is to get as much of it as we can done during my tenure here at the department.

Mrs. EMERSON. That is good. Thank you.

ACCELERATED CLEANUP STRATEGIES

You mentioned the accelerated cleanup strategies you are developing and evaluating to aggressively clean up sites or segments of

the work involving multiple sites. Can you just talk a little bit about the review of these strategies? Is there an independent entity looking at those ideas to make sure the safety and efficiency? Or is that review done within EM itself?

Mr. RISPOLI. Let me mention really quickly, we have, as you know, not only closed complete sites, sites such as some of the ones we have mentioned, like Fernald as an example. But we have closed discrete areas on bigger sites, larger sites in discrete areas. We went through this 18-month effort to re-evaluate our costs and schedules.

They are now to such a degree of detail, we could actually look at making business decisions to close discrete areas on big sites or perhaps even pick out a few smaller sites and get those closed. So we now have the tools to do that, and in fact we have begun the process of evaluating from a business perspective whether or not that would be a good way to go as we go forward.

Mrs. EMERSON. Okay. Of the cleanup sites left to address, which ones should we be most concerned with? Which one are you giving special attention to, or are there any special considerations for that site?

Mr. RISPOLI. From a risk perspective, unfortunately, the places that still take the largest dollars, and I believe it is nearly 50 percent of our budget, are the liquid tank waste issues at Idaho, at Hanford, and at Savannah River. I mean, that is just the reality of what it is. The volumes in those tanks are such that they just have to be dealt with.

So that greatly, of course, takes a big wedge out of our budget that has to be dedicated to that. What we are looking at, as I said, though, is with the information we now have, can we make business decisions to target smaller areas like an area at Savannah River. We closed Melton Valley at Oak Ridge. I think we closed the "T" area—is that the name of it at Savannah River? These are discrete sites on a bigger installation and we are looking for opportunity to do more of that.

Mrs. EMERSON. Very good. Thank you so much.

Mr. RISPOLI. Thank you.

Mrs. EMERSON. Thanks, Mr. Chairman.

Mr. VISCLOSKY. Mr. Simpson.

Mr. SIMPSON. Thank you, Mr. Chairman.

Welcome to the committee. This is going to be the last time, so let's get some tough questions. I am just kidding. [Laughter.]

I do want to thank you, before I begin, for the job you have done. I think you have been one of the best EM directors we have had and gone a long way toward to restoring some credibility within the Department, so I appreciate what you have done.

MISSED COMPLIANCE AGREEMENT MILESTONES

Now, let me ask questions. According to the Secretary's testimony on February 28, the EM's fiscal year 2009 budget request of $5.528 billion would not meet some of the milestones and obligations contained in all of the environmental agreements that have been negotiated over many years with regulators. I am interested in what compliance milestones will be missed at the $5.5 billion level and how much money is needed if we were to fully comply

with all of those milestones? And could we comply with all of them technology-wise, or if money was no object?

Mr. RISPOLI. I think we provided to the staff and to the subcommittee ahead of time a summary. Let me just run through it so that it is on the record here. In 2008, not all of these would be budget-driven, but a fair number of them are and you have the breakdown on a cheat sheet. In 2008, we are projected to miss as many as 16. I shouldn't say we will miss them. I would say we could miss as many as 16.

Mr. SIMPSON. Are those budget-driven?

Mr. RISPOLI. Not all. At Oak Ridge in 2009, as many as nine. Not all of these are budget-driven, and the table you have that I think looks like this or something similar to that actually shows the numbers. I can give them to you in that detail if you would like. At Oak Ridge, we could miss as many as 11 in 2008, all of which would be budget-driven. In 2009, we could miss as many as nine at Oak Ridge, seven of which would be budget-driven.

To buy back those milestones would take about $65 million at Oak Ridge.

Mr. SIMPSON. Just at Oak Ridge?

Mr. RISPOLI. Yes, sir.

At Richland, Washington, I will cover Richland and the Office of River Protection separately, but they are basically the same Hanford reservation. In 2008, we could miss one milestone at Richland, not budget-driven, technical reasons. In 2009, we could miss as many as 11, of which seven would be budget-driven.

And of the total, which is not small, the amount it would take to buy those milestones back, and I am prepared to talk about some of the typical ones and what they are if we have time, would take almost $500 million at just that one site, to buy back those seven budget-driven milestones in 2009.

At River Protection on the same site, they have a potential to miss as many as three in 2008 and another three in 2009, none of which are budget-driven. They would primarily be driven by the technical challenge of dealing with the liquid tank waste and things of that nature.

At Savannah River Site in 2008, they would be at risk of missing one milestone in 2008 and it would be budget-driven. And in 2009, another five, also budget-driven, and that could be as much as, say, $175 million to $200 million, something in that range. At Los Alamos, none in 2008 would be at risk, but in 2009 as many as three budget-driven would be at risk, and that would take about $100 million to not miss those.

Those are the most significant ones and the total would be in the range of $800 million to $900 million.

Mr. SIMPSON. About $800 million to $900 million?

Mr. RISPOLI. Yes, sir.

Mr. SIMPSON. How many of——

Mr. VISCLOSKY. Would the gentleman yield?

Is that $800 million to $900 million total for 2008 and 2009? Or is that 2008 or 2009?

Mr. RISPOLI. Those would be to buy back the 2009, because 2008 is already——

Mr. VISCLOSKY. That is just 2009?

Mr. RISPOLI. Yes, sir.

I would also for the record point out that there are also future milestones. In other words, you do a milestone in 2009, and it may then spawn other milestones for the future. That would cover 2009 and what we know would be other milestones related to those in the future.

Mr. SIMPSON. Let me get that straight. What you are saying is, you miss a milestone this year; it causes you to potentially miss milestones further down the road.

Mr. RISPOLI. That is very true.

Mr. SIMPSON. And if you had the $800 million or $900 million, that you could meet the milestones now and you might not miss those ones down the road.

Mr. RISPOLI. That is true.

Mr. SIMPSON. Are you counting when you say that such as Richland that you have seven budget-driven milestones that you might miss in 2009? Are you counting future milestones that you might miss because you have missed these seven?

Mr. RISPOLI. Not in that number. No, sir, that is only milestones in 2009. But as an example, if I may, let's say that there is a report due that studies—let's just pick a hypothetical—a groundwater contamination. You make that milestone on time. You may then sit with the regulator and develop another three or four milestones to do certain things, like put in wells, begin a treatment system or something like that. So just doing that milestone may then result in future milestones. So clearly if you don't meet the first one, you then push the other ones further out as well.

MISSED MILESTONE FINES AND PENALTIES

Mr. SIMPSON. How many of these missed milestones are subject to penalties and fines?

Mr. RISPOLI. Not all of them, but a number of them would be.

Mr. SIMPSON. Do we know what the total fines potentially could be with the Department for missed milestones at this budget level?

Mr. RISPOLI. We have a pretty good estimate. It is somewhere in the range of $10 million.

Mr. SIMPSON. And that is for next year?

Mr. RISPOLI. That would be for 2009. Yes, sir, the 2009 milestones.

Mr. SIMPSON. Do we have an estimate of what the penalty would be because of these missed milestones of future missed milestones?

Mr. RISPOLI. No, I don't believe we do. No, sir.

Mr. SIMPSON. I assume that missing these milestones means that the Department is intent on renegotiating contracts or agreements with states.

Mr. RISPOLI. Yes, sir. The process whenever a milestone is at risk, and we have already begun dialogue with all of the states because this is very important to our sites and to the states, is to begin that dialogue and to look at the relative priorities, because for example, the budget we are proposing to you represents priorities as we in our best judgment evaluate it. But a particular regulator may say, you know, I would rather see you do this milestone than that one, and we are open to that type of dialogue.

We certainly hope that with the longstanding relationship we have with these regulators, that we can continue to engage in that dialogue. I have spoken with several myself. Our other executives have spoken with other state regulators, as well as the site managers, to begin that process.

COST PROJECTION CONFIDENCE

Mr. SIMPSON. I noticed in an article I was reading that at Hanford, the largest site cleanup in the complex, DOE now projects completion between 2050 and 2062, which is 20 years behind the previous estimates. At Savannah River site, it is 2038 to 2040, compared to 2031 in the 2008 request. At Idaho, it has moved from 2025 to between 2035 and 2044.

Obviously, we are pushing the projected completion dates—I should emphasize "projected"—of these sites back a number of years. Is there any confidence that this is any more than any of the other projections in the past? Because we have kind of had the same—and I am not trying to throw cold water or anything—but we have had the same type of reports from other EM managers that have come in and they have done a top-to-bottom review and moved the sites and so far. And we got, "Aha, now we have some firm knowledge of when this is going to be done."

And we keep doing it and we keep doing it. It is kind of like studies when Congress does them. We pile up on shelves. What confidence do you have that this is any more accurate than any of the other studies that have been done?

Mr. RISPOLI. Congressman, I think what happened to us in the past, and I think you are absolutely correct in your observation, I think that all of our projections were done with the view that we were challenging the contractors and therefore we were projecting with the most optimistic outlook.

Now, that is a great thing to challenge the contractors, but when I mentioned that we did an 18-month process to review the entire program and it was audited by people who are outside of my program, independently audited, they audited for the first time to a realistic funding profile. Before that, they were all estimated too unconstrained, so everyone was estimating and making all these commitments to you and to the state regulators based upon unconstrained funding profiles.

Now, we have gone through and used this funding profile, and by the way, out here, we just said adjust for inflation. Assume it is flat and just adjust for inflation, because this is now $6.1 billion to $6.2 billion at the last part here. So we have redone this in an intensive 18-month effort. The work is voluminous. It breaks every project down into what they call a work breakdown structure so that every element of work is estimated.

And now for the first time, each element of work has an early finish and a late finish, so we have allowed for risk. So when you ask how do you know that it is realistic this time, these estimates are no longer a point estimate. They say, okay, the best finish is here; the worst or the most pessimistic finish is here. And likewise, congressman, on cost, the most optimistic cost is down here and the most pessimistic cost is up here.

So for the first time, we can share with the communities at each location, with the regulators and with the Congress what those cost and schedule ranges are. The actual work at each site would fill bookshelves, but we are working on providing a synopsis that we can provide to show for the whole program, site-by-site, and at the major work elements, site-by-site, what are the early-finish, late-finish, the low-cost and the high-cost ranges for the entire program.

So I think this is intended to restore confidence with the Congress and with the communities that we recognize have suffered.

Mr. SIMPSON. What has been the response of the states and regulators and the communities?

Mr. RISPOLI. Everyone that we have talked to, including professional organizations that I have explained this to, think that we have done exactly the right thing.

Mr. SIMPSON. Will renegotiation of settlement agreements be required because of a more realistic view, if you want, of cleanup?

Mr. RISPOLI. Yes, sir, but the beauty is that now we have enough detail so that we can sit with the regulators and say, okay, if you would like to delay this one in favor of that one, this one costs so much money, this one costs so much money, can you move that around to come to a mutual agreement with the regulators.

PENALTIES PAYMENT RESPONSIBILITIES

Mr. SIMPSON. If I could just finish this line for a second—not this line—I got distracted with this for just a second.

Back to the penalties.

Mr. RISPOLI. Yes, sir.

Mr. SIMPSON. Who pays the penalties?

Mr. RISPOLI. If it is driven by a lack of funding, the Department of Energy would pay the penalties. Some penalties that you have read about in the papers that were caused by other performance issues, we assess those to the contractor. But if it is driven by a lack of funding, then the department would pay the penalty.

Mr. VISCLOSKY. If I could, it would not come out of the U.S. Treasury. It would come out of DOE's budget.

Mr. RISPOLI. It would come out of DOE's budget. Yes.

Mr. SIMPSON. Is there a line item that is in your budget for penalty payment?

Mr. RISPOLI. No, sir. The penalty—correct me if I am wrong—but I believe it would be paid from the money provided by this committee for that project.

Mr. SIMPSON. That kind of bothers me, because if we are putting money into a project for cleanup and we use it to pay a penalty instead of the cleanup, obviously I would like to see more of the money actually go into cleanup.

Mr. RISPOLI. Yes, sir.

Mr. SIMPSON. Are the penalties always paid in cash? Or are there in-kind payments?

Mr. RISPOLI. We actually went back to look at that, and there are both ways. Some are paid in cash. For example, we have paid several penalties to the US EPA in cash to their penalties fund.

Mr. SIMPSON. To USEPA?

Mr. RISPOLI. Yes, sir. We have paid several in cash to them, and we have paid several in cash to a state equivalent-type fund. It

might be like an emergency response fund in a state where the money would go toward helping them for emergency response. But in the case of the federal EPA, it goes to their collection fund.

Mr. SIMPSON. Do the settlement agreements generally dictate how those penalties will be paid, or to what they will go in the state, if it is a state that gets paid?

Mr. RISPOLI. We have had penalties, and not all of them are for missing a milestone. There may be others.

Mr. SIMPSON. Sure.

Mr. RISPOLI. Generally, what happens is then our site manager enters into negotiation or dialogue with the regulator and they may determine an in-kind type of a thing. For example, in Richland, I think we bought two boats for the Columbia River for the state to be able to pull samples, pull water samples, which actually does benefit the state and the program.

In the state of New Mexico, I think we have paid, and some has gone to provide staff so they can review our work, and others have gone into their emergency response fund. So it is negotiated each and every time, and it is not always a given that the maximum penalty—when I gave you the roughly $10 million—it turns out to be the penalty. Sometimes it is negotiated to some other amount.

MISSED MILESTONES PENDING LEGAL LAWSUITS

Mr. SIMPSON. Is the department being sued anywhere by outside entities, not the state regulators or the people with whom you are in agreements, for missing agreements?

Mr. RISPOLI. I think I would take that one for the record. I just don't know off-hand. I do know that there have been a number of outside groups that have sued related to certain types of things. For example, a current interesting one is an outside group sued the regulator in the state of New Mexico and brought them to court. Eventually, I believe the state prevailed. But this is not an uncommon thing. I would take that question for the record, if you would like.

OUTSIDE ENTITIES LAWSUITS

No, the Department is not being sued by any outside entities for missing requirements in our cleanup agreements.

Mr. SIMPSON. Okay. Yes, I would like to know that, because I have heard of—and of course you hear of a lot of things but—groups that sue the department for noncompliance to something. And part of the settlement, and it is usually an out-of-court settlement, is to help fund that group in future years. That kind of concerns me.

But I will quit now and move on a little bit later.

Mr. VISCLOSKY [continuing]. To follow up on Mr. Simpson's line of questioning. When we are talking about missing a milestone for budgetary reasons for lack of funds, and you mentioned the gap of $800 million to $900 million, that is in the proposed 2009 budget?

Mr. RISPOLI. Yes, sir. And it is only tied to those particular milestones.

Mr. VISCLOSKY. But you would need an additional $800 million to $900 million to make sure, from a budgetary standpoint.

Mr. RISPOLI. Yes, sir. But as I would point out, not all milestones are what you might say equal. I, in fact, have some examples that—some might be considered more significant than others, but they are not really all equal, so to speak.

Mr. VISCLOSKY. Okay.

Mr. Calvert.

NEW REPROCESSING TECHNOLOGIES

Mr. CALVERT. Thank you, Mr. Chairman.

To preserve nuclear energy as a part of our future, electric generation especially, we must move toward technologies that I believe you can process spent nuclear fuel and recycle the hazardous radioactive materials. For the record, what reprocessing technologies are you presently working on and what is being developed at Argonne or any of the other labs?

Mr. RISPOLI. Well, I can address certainly within my own program. We have the capability to, for example, recover uranium in our H Canyon at the Savannah River site, where we have an ongoing program to bring other uranium products from all over the complex to the H Canyon. We are doing this not only for environmental management supplies of uranium, but even other programs within the Department of Energy. So that capability to recover uranium already exists.

The Department is also working on a uranium strategy. I would say it is pretty far along. It is being headed up by the Office of Nuclear Energy. My office is cooperating with the Office of Nuclear Energy, but they are looking at the entire inventory of uranium across the Department of Energy, both within the nuclear energy supply, the environmental management supply, and the former weapons program supply, and looking at what can be done with this uranium, what would be the best way to manage it for the benefit of the nation, really.

If it is to be released to public consumption, in what manner and at what rate to not upset the uranium industry, to not cause an imbalance or an uncertainty in the market, things of that nature. That is pretty far along. As I say, we are cooperating with the Office of Nuclear Energy on that issue, and that is being headed up by Assistant Secretary Spurgeon, who I think you know.

Mr. CALVERT. Is there any reprocessing technologies in the basic research stage right now that are moving along, that have promise, that need funding, that you see on the horizon that might be ready for some kind of laboratory-scale type of study?

Mr. RISPOLI. Congressman, I understand the question, but I think I would take it for the record or it would be better answered by Assistant Secretary Spurgeon. I don't know yet—has he yet appeared before this subcommittee?

Mr. CALVERT. No.

Mr. RISPOLI. Is it next week perhaps, or postponed until April? But I could take it for the record or you could also address that to him when he appears before you.

PROMISING REPROCESSING TECHNOLOGIES

Yes. The following are few examples of promising reprocessing technologies that would benefit from additional funding. A first example is the reprocessing of graph-

ite-based fuels. Spent fuel from high-temperature gas-cooled reactors is difficult to reprocess, because the fuel particles are coated with graphite and silicon carbide, neither easily penetrated by conventional dissolution processes. Grind-leach processes have been partially successful, and there has been some progress in the use of molten salts as silicon carbide solvents. Fluorination is technically feasible but provides significant containment problems. The reprocessing of graphite-based fuels is a fertile field for basic research.

A second example of a promising class of advanced reprocessing technologies is hybrid treatment in which aqueous dissolution is followed by crystallization, solvent extraction and electrochemical separations. The separations literature contains information on each, but combined experimentation is uncommon yet offers considerable potential.

A third example is the exploration of ways to convert electrochemical separations which are currently operated as a batch process into a continuous, counter-current process. In concept, one could imagine the flow of a molten salt and molten metal in opposite directions in a series of contactors, within which electrolytic or chemical exchange processes take place. Counter-current processes in general offer potential for very high recoveries, low losses and high throughput, and all three attributes would be beneficial for non-aqueous spent fuel treatment.

Mr. CALVERT. Okay. Thank you.

Mr. RISPOLI. Yes, sir. Thank you.

Mr. VISCLOSKY. Mr. Wamp.

Mr. WAMP. Well, this is my fourth hearing in the last 6 hours on completely different topics, on things all around the world. So I will try to focus.

I want to start, Mr. Secretary, by echoing Mr. Simpson's comments. You have drawn the short straw and difficult environment and you have done a very good job, but the deck is kind of stacked against you. It is a tough time, but I do really, really appreciate your service.

This EM post, in my 14 years of service, is always the kind of hardest one to fill and to keep. And so you should be commended for serving your country in a challenging environment.

I don't know if anybody here can answer this question, but I was just at another appropriations subcommittee hearing where it was said that at last night's budget markup, that a particular priority was fully funded in the budget resolution. Does anybody know where EM would come out in 2009 based on the budget resolution that passed the Budget Committee last night? Does anybody have any idea?

Mr. SIMPSON. I was way too tired when we passed it.

BUDGET PRIORITIES WITHIN DOE

Mr. WAMP. It was 12:30 a.m. when they finished, and I actually watched it until about 11 o'clock. That is how bored I was. The budget resolution in some years doesn't mean anything. This may be one of those years. In some years, they do mean a lot. But I just wondered, because that is somewhat a piece of this, is there any money for the Congress to do anything more than what OMB has asked us to do with respect to environmental management.

Because obviously I was surprised last Thursday at Secretary Bodman's candor when I asked him the question that you heard me ask at the cleanup meeting, and that was whether we were moving from accelerated cleanup to decelerated cleanup. And Secretary Bodman just basically said last Thursday, I am afraid you are right.

But he also went on to say that OMB has just tied the hands of the Department of Energy. Do you believe that is just the final analysis of where we are at right now, is that you made a valiant case for why we don't want to be out of compliance and miss milestones and get fined and postponed and put off, but OMB just wouldn't hear the cry.

Mr. RISPOLI. Congressman Wamp, if I could answer that this way. First, when you opened you thanked me, but I have to say in all honesty that many of the executives in this room and the other 34,000 people at your site and all of our sites are the ones that are really making this happen. I think they have done us all a fabulous job and they will continue to do that long after I am gone. So I thank you for the compliment, but they are the ones that are doing this.

My own view toward any budget process is that, number one, any of us would like more in anything we do, in our personal lives or anywhere, but when you get what you get, my job then is to get the maximum return to the American public for what we get. And that is what we have endeavored to do.

You reach a point where you can't go back and lament what you didn't get. You have to look forward and say, this is what I got, and what do we do with what we have to try to make this a better-running program. I am here to defend the budget. The Congress certainly has the right to give us what we ask for or give us less or give us more. But whatever that is, we will do our utmost to deliver to the American public and the communities the best we can for the money we have.

Mr. WAMP. I am not being snide, but I would ask, on your own sheet of 2008 versus 2009 site-by-site budgets, Mr. Simpson and I, our sites are down, and Paducah, Portsmouth and Savannah River are up. The rationale behind that——

Mr. VISCLOSKY. That is a big mistake.

Mr. WAMP. Well, they are trusting the Congress way too much, aren't they? Is there a rationale behind the budget request on those sites?

Mr. RISPOLI. Congressman Wamp, for us, the entire budget was driven on a risk reduction basis. Unfortunately, when we look at Idaho and when we look at Oak Ridge, D&D is considered by us generally, not absolutely, to be among the lower-risk problems we have.

Now, sometimes you have to do the D&D and get the building out to deal with groundwater, and I think what has happened to both sites is when the year got to be lean, D&D was what we had to address first as being on the relative risk ranking of a lower priority.

Now, as Mr. Simpson knows, we are working on some planning to perhaps look at re-racking what we do at Idaho to not cause a major loss of skilled people, because as I pointed out on this 5-year funding profile, 2009 is the lowest year. We don't want to go through one of these periods where we have a dip and lose people and then you can't get them back to do the work. So we are ready, willing and able to do that.

I will also tell you, Mr. Wamp, that we are working very carefully with Gerald Boyd down there, the site manager, to work on

our acquisition planning and our project planning for this integrated facilities disposition plan so that when other work finishes up in the 2011 timeframe, we don't lose that workforce and still have all of that major work to do.

So again, with the idea that we do the best we can and we try to make the right decisions for the communities and for the nation, that is exactly what we are doing.

Mr. WAMP. My staff actually wrote a note on here that said, he is going to say that it is all based on risk reduction, et cetera. [Laughter.]

But let me also just put in here the caveat that we see is that if your site does a really good job at meeting its milestones and cleaning up the site, there is lower risk. And so the whole system rewards the ones that are out of compliance, not making progress, not meeting milestones. That is where the money goes in the budget request, and then we are sitting here saying why are we working so hard to make sure that we are a model site, and that we meet our milestones, et cetera? I know why, it is because that is what you are supposed to do, but the system I think is a little upside down.

Tennessee does have 11 missed milestones, seven of which are budget-driven. On January 9, I got a letter from the governor—you got a letter from the governor, I got copied on it—and I thought, now why is the governor of Tennessee sticking his finger in the eyes of the Department of Energy? Then the president's budget request came out February 4, and I said why is the Department of Energy sticking their fingers in the eye of our governor?

It is right at Mr. Simpson's question here. Our site is a little different on those missed milestones. It is not just a fine. It is that we have an incinerator that the state permits. You have to turn right around and ask the state for a permit to use the incinerator. So it is a whole lot more than just paying a fine and going on.

Frankly, the letter that the governor wrote here is about as tough as one we have seen, and I have been on both sides of this thing, with a Democratic administration, Republican Congress, now Republican administration and a Democratic Congress, a Democratic governor or a Republican governor. I have literally seen every view of this prism in the last 14 years, and this is very serious.

The environmental management missions at the Oak Ridge site are my critical care patient. And we have to find a way somehow to get back to square one so that we don't end up so sideways with the state that we can't even carry forward on our missions. It is not as easy as to say the low-risk priorities can wait. It is not just that simple with us. It is a whole lot more of an integrated site on a variety of fronts, and we have to have the cooperation.

INTEGRATED FACILITIES DISPOSITION PLAN

Now, I want to close with saying I really appreciate you mentioning IFDP without me bringing it up, because it is a little awkward to even bring up the integrated facilities disposition strategy at a site like ours when we don't even have adequately funded yet the current accelerated cleanup milestones and missions of the

Cold War legacy that is out here, and that is underway, talking about and then where do we go after that.

But when you are talking about workforces, like Mr. Simpson is, it is very important because, again, we are trying to maximize efficiency. So we want to go ahead and set up the long-term strategy of cleaning up this and this and that because we see this as a very serious responsibility of the federal government.

We made a decision to build up the nuclear deterrent, and there is an environmental legacy associated with it, and we can't retreat from it. I mean it literally is like your home. If there is a big mess in your home, you are not going to keep functioning as a family until you stop and clean it up. That is where we are at.

So IFDP is important. I think it is great long-term planning. Are there other sites around the country that have an organized plan like the IFDP in Oak Ridge to look at beyond accelerated, beyond the current closure, how do you maintain the budget authority, the workforce and the momentum to go ahead and finish cleaning up within the fences of what are state-of-the-art facilities.

I mean, the Y2 national security complex and the Oak Ridge National Laboratory are really two of our jewels now in the whole system. In the modern era, they have gone through a transformation, but it is very ironic to have brand new buildings prepared for the balance of the 21st century next to World War II-era buildings that literally look like Quonset huts that need to come down. They literally are side by side. It is almost like you are caught in a time warp of two generations.

Mr. RISPOLI. I would say, in all honesty, I think that the Oak Ridge site has done the best job I know of of any in looking at their future needs and how to integrate their future needs with their present. I think you must know that when I talked about the acquisition planning and the project planning, they have had an industry day. We have been seeking input on how to approach this.

We recognize that this is important, and we recognize, too, Congressman Wamp, that we can't afford to lose the workforce and then have to spike them back up again. What we did this year at Oak Ridge because of the relative risk ranking, we basically took whatever shortfall there was and focused it on ETTP, believing that that would limit the slowdown to that one particular area. It will delay the completion. Instead of the 2010, 2011, 2012 timeframe to probably 2015, because of the way that we prioritized the work at Oak Ridge.

Again, our objective is to be sure that the planning for the IFDP can be done in such a way that using this funding profile that we plan to, that we gave to the Congress last year, we preserve that workforce and can recommence and pick up that work as we go forward.

Mr. WAMP. Mr. Chairman, thank you for your courtesy. I know I went over the 5-minute limit.

Mr. VISCLOSKY. No, no. Thank you very much, Mr. Wamp.

MISSED MILESTONES CONSEQUENCES

Mr. Rispoli, I am going to return to Mr. Simpson's line of questioning about the compliance milestones and project management. But before I do, I would follow up on Mr. Wamp's observations and

the dilemma we have talked about on the committee and the dilemma I think we face. And that is for people who are doing their very best and showing results, depending on where they fall on a risk continuum, we tend to assume they will be taken care of at some future date or they can take care of themselves.

For others who year after year and going back 10 years, continue to fail as far as project management, operational systems, changes that don't pan out, huge overruns in their budget, because of the public risk, it is very difficult for us to propose corrective action. I have an impulse to just, well, you don't need any more money. I am not saying, you, but that project, that manager, that system, that location, they don't need any more money. You can't do that.

On the other hand, no, listen, we are going to do a better job next year, and there are several sites—we are going to talk about some of them—we are having the same conversation today that we had in 1998.

And I must just express my frustration with that, that I don't know how to get at that problem, to really force some corrective action in some of these areas.

Mr. Simpson did cover a lot of material in the waterfront on compliance. But it is an important area, and I would like to discretely go down some areas with some additional fill-in questions.

On each of these, for the record, we certainly would want to know, from a budgetary standpoint, because we do have the sheet that you provided the committee yesterday. For each of the milestones that are being missed, for a budgetary reason, whether it be 2008 or 2009, what is that dollar amount? Because, for example, with the $800 to $900 million spread, that is a huge volume. And we had an interchange with the Army Corps earlier this morning where we had 54 lines of justification for $2.5 billion. I suggest that that is just not going to do it.

So in each of these, I would appreciate per milestone, what the budgetary implications are.

For the waste isolation pilot plant, the fiscal year 2009 budget request is $211.4 million. That is a decrease of $23 million. Again, I would ask, and it would be true for each one of these, if you could enumerate specifically, which milestones are being missed.

Also relative to WIPP, since this is a disposal facility, are there other sites that will miss milestones due to the level of funding proposed at WIPP. And I would ask you that now.

Mr. RISPOLI. I think it is fair to say that WIPP should be able to handle everything that is destined for WIPP, but that for certain sites the amount that they can package and ship could possibly change.

Now one of the things that we just announced, yesterday, or the day before, when we passed along a copy to you is, an ammended record of decision whereby we will use the Idaho facility, the advanced mixed waste treatment facility, and we will take transuranic waste destined for WIPP from other sites and, in order to get a better efficiency and use equipment that is already in place in Idaho, bring that material to Idaho so that it can be prepared to be shipped to WIPP and then be shipped directly from Idaho to the Waste Isolation Pilot Plant.

So again we are trying to do things that are, perhaps, more innovative, to minimize the impacts of our ability to ship waste from throughout the complex to the Waste Isolation Pilot Plant.

Mr. VISCLOSKY. And it would be true for this in each of the subsequent questions in this field, if there are fines or penalties per compliance miles, then we would want to know what those anticipated fines or penalties are. At the Idaho National Laboratory, for the 2009 budget, the request is $447.4 million, a decrease of $76.1 million below the 2008 inactive levels. At this funding level, are you deferring the decontamination and decommissioning of buildings, and slowing of varied waste retrievals? And are there any other additional missed milestones as a result of this?

Mr. RISPOLI. Mr. Chairman, at Idaho, we would in fact slow both retrievals of waste as well as D & D, but I would point out that there are other high-risk activities, including milestone driven that will be met, such as ground water treatment in certain areas on the installation, shipment of transuranic waste to the Waste Isolation Pilot Plant.

Still making good progress on the tank farm and getting the tanks empty. And as I mentioned we would still continue on with construction of the sodium bearing waste project.

We are considering at Idaho as I alluded to, but it might not have been clear, we are considering, if we don't put a real push on getting the construction for this new construction project done to treat the sodium bearing waste in the three remaining tanks that have that waste, could we in fact, avoid the loss of skilled workforce that are doing these other tasks. And the answer appears to be that we can do that.

And so we are looking at those types of things, too, to mitigate the negative impact that could occur and the loss of skilled people at Idaho. Right now we are projecting no missed milestones at Idaho even though we are beating a number of activities that are driven both by milestones and by risk reduction.

Again, as you correctly pointed out, the focus on where money would not be sufficient would be in the areas of D & D and also some waste retrieval. But we think from a risk perspective again we have made the right decisions in that regard.

Mr. VISCLOSKY. At Oak Ridge, for 2009, you have a decrease of $40.4 million. At this funding level, are you in compliance with the federal facilities agreement?

Mr. RISPOLI. At Oak Ridge, that is the place where, I think I mentioned earlier, at which we probably have the most milestones in jeopardy. It would be a total of 11 in 2008 and another 9 in 2009. All but two of those are budget related. And again, the combined value of those would be about $65 million. But I would point out that——

Mr. VISCLOSKY. So you wouldn't be in compliance with the federal facilities agreement?

Mr. RISPOLI. I am not sure that it is the federal facilities agreement. There are several agreements at Oak Ridge. We operate typically under RCRA, under the Toxic Substances Control Act, under several, so they may not all be directly tied to the FFA. But I would point out, as an example, what we consider to be a very high priority at Oak Ridge, is getting the uranium 233 out of building

3019. That is driven by no milestone. And we have put a very high priority on that and intend to continue to make progress on that project. And that, by the way, is one which this committee directed EM to do. It was previously an NE responsibility, Nuclear Energy, and we have taken that on, and we are making very good progress on that now.

Mr. VISCLOSKY. At Richland, the budget request for 2009 is a reduction of $48 million below 2008. At this funding level are you in compliance with the tri-party agreement?

Mr. RISPOLI. We would have at jeopardy as many as four milestones in 2008 and another 14 in 2009, but only 7 of those 14 would be due to budget, and none of those in 2008 would be due to budget.

We have been in dialogue with the state. I have been out there several times working on the issue, primarily driven by the tank waste, the delay in the treatment of the tank waste. The short answer is, yes, we would have several milestones in jeopardy. But once again, we believe that we have picked the lower risk-related milestones. We need to dialogue with the state to see whether they would concur with the milestones that we believe are the lowest risk milestones.

Mr. VISCLOSKY. I would then have the same series of questions about the milestones tri-party agreement and penalties for the Office of River Protection, where there was an increase of $9.8 million in 2009. For the Savannah River site, there was an increase in the budget of $63 million, and again would have the same series of questions.

I would have the questions relative to clean-up activities at Los Alamos National Laboratory, where there was an increase in the funding request of $10.4 million. I have the same request for clean-up activities in Nevada, I saw a decrease as far as budget request, of $14.8 million.

I have a request for the West Valley site. We saw an increase in funding of $3.5 million.

Next is the Brookhaven National Laboratory, which has a decline in funding of $19.9 million.

For the Stanford Linear Accelerator Center, which is declined by $1 million. And also for the Moab site, that saw an increase in $6.8 million over the enacted level.

If I could ask you about the renegotiation of these milestones, and again, there have been some conversation about that, what protections does the government, do the taxpayers have, that in these negotiations, well, just to get somebody off our back. You do have a new administration, we have a new Congress coming in. Look, I will agree to anything to get you off my back.

And so we are going down this road. I miss a milestone, boom, I am in a new agreement to get some regulator, someone off my back. And maybe it is an appropriate agreement. But suddenly now there is a new program, there is a new tank, there is a new process, and there is a new cost. And we have seen that occur over the years.

What direction, what controls do you have over this so that when whoever is here next year is having the same discussion, that, hey, wait a minute, somewhere over the last 12 months, because of

some anticipated missed milestones, whether it be funding or contractor failure, all of a sudden somebody took a hard turn in the road. And we have a whole new program now that has been promised and contractually entered into. How can we best make sure that that doesn't happen?

Mr. RISPOLI. Mr. Chairman, I think you have hit on exactly the problem that helped get us to where we are. When there was a shortfall of money in a given year and negotiations were being done in good faith, those milestones would be moved out to a future year with the hope and the expectation that the funding would be adequate.

When I said we spent 18 months redoing all of our costs and schedules, we redid all those costs and schedules to this 5–year funding profile we provided to you last spring. And all the milestones are imbedded in there.

So now our site managers can sit down with the regulators at each state and say this is our long-term funding profile, and discuss with them what can we do and what can we not do and share where are the priorities.

Because there is enough detail now, it is broken down to what I call the work breakdown-structure-level work packages, with the best estimate cost, worst estimate cost, early finish, late finish, so we now have for the first time, enough information to sit down, really at the micro level, not just roll it up to present to you, but at the micro level at each state, to sit down and do something that is much more credible and much more reasonable.

So when I mention we wanted to restore our credibility with the Congress, it is not only with the Congress, it is with the regulators, with the communities, because for the first time we have that information, all independently audited. It has never been done before.

EM PROJECT MANAGEMENT

Mr. VISCLOSKY. I have one more series of questions for this round for myself for project management and would have a question for Mr. Owen after that. And then if I could turn to Mr. Simpson.

On project management, the May 2007 GAO report on DOE project management says that despite considerable efforts to improve, such as training for federal managers and having contractors implement their own value management systems, overall performance on DOE's projects has not substantially improved.

Performance goals for line-item projects were only met one-third of the time. Starting in 2004, DOE began reporting performance information separately for EM clean up activities, funded from operating funds, rather than as individual line-item construction projects. Prior to this time these operating projects were included with the line-item construction projects.

Since February 2004, these operating projects met cost and schedule performance goals only about 21 percent of the time. Can you give us some examples of EM operating projects in your costs?

Mr. RISPOLI. Yes sir, I can. Basically, right now, EM has only a handful of capital projects, so let's get those set aside first. The Waste Treatment Plant at Hanford, the sodium bearing waste

project at Idaho, the Salt Waste Processing Facility project at Savannah River, are among the handful of line-item projects we have. The other 70-plus projects are not funded as capital projects. They are operating-funded.

In June of 2005, EM signed a commitment that all of those operating projects, over 70 of them, would come into full compliance with DOE order 413, which is the project management order. That was not done until June 2005. In fact I signed it as the director of the Office of Engineering Construction Management before coming to this position.

When we first got started with this, as I mentioned, I have this sheet but this is a report by OECM and, from July of 2005, that shows that we had 17 projects that were not green, they were red or yellow, which gave us a track record of only about 51 percent on cost on schedule.

I honestly don't know where GAO got 21 percent. I can't find anything as low as 21 percent. But I did find for this report about 51 percent that were on cost, on schedule, as opposed to 21 percent.

Now what we do, this is again an Office of Engineering Construction Management chart, and Mr. Chairman, I am very happy to tell you, that with a lot of hard work by a lot of people at all of our sites, we now have only one project that is not green.

You see this track record starts down here at 80. This was in August of 2005, and you can see it gradually but persistently climbs to the point that we are now near 100 percent.

Our objective is to maintain 90 percent on cost on schedule. We have not been below 90 percent since August 10 of 2006. So when I talk about credibility, it is not only having accurate cost and schedule ranges, but performance. Right now, the Environmental Management program is unequaled in the Department of Energy in the percentage of our projects that are on cost and on schedule——

Mr. VISCLOSKY. On operating projects, what is your level of confidence in the cost estimates?

Mr. RISPOLI. All of those ranges are audited to the 80 percent confidence level. But it is a range, Mr. Chairman. In other words, when you are looking that far out, you have to have a range.

Mr. VISCLOSKY. It is audited to 80 percent. What is your confidence level in these cost estimates?

Mr. RISPOLI. I have a very, very high degree of confidence in these cost estimates. I do not know what else we could have humanly done within the understanding I have of project management and cost estimating to do a better job than we have done in getting these cost estimates to the 80 percent level.

Mr. VISCLOSKY. I believe you gave it your best shot possible——

Mr. RISPOLI. I will tell you, we do not fund then into the 80 percent confidence level. The operating projects that we put into the budget are not put into the budget at the 80 percent confidence level, they are put into the 50 percent confidence level and there is quite a difference between how much you would have to have—we do not think it is prudent to budget to the 80 percent confidence level because it would greatly constrain what we could do with the money we have.

So as a result, when I mention those 34,000 contractual employees, we challenge them every day to perform, because the funding they have is not to the 80 percent, it is to the 50 percent confidence level.

Mr. VISCLOSKY. I just was going to ask the same thing. I have been waiting to hear the 50 percent.

Mr. RISPOLI. Yes sir. Every project when you develop it is made up of many many building blocks, and every one has an optimum, or a best case and a worst case, for both cost and schedule. And it most likely is somewhere in the—you can actually calculate, using standard tools available in any profession, what is the right number to the 50 percent confidence level. Which means, 50 percent, I will make it, 50 percent, I won't.

Or even to the 100 percent. But it goes like asymptotic—the curve goes way up. So the standard in industry generally is to—like in capital construction in the private sector, is to estimate to the 80 percent confidence level. We have adopted that, using that for all of the value of our portfolio. So the life cycle cost of our entire portfolio has been developed with a range that gets you to the 80 percent confidence level. However, because the curve goes asymptotic, the amount of money you would need, we can't afford to budget to the 80 percent for a program this size.

So we budget to the 50 percent.

Mr. VISCLOSKY. I didn't understand your answer at all.

Are you saying that you are 800 or 900 short for 2009 or are you only—I don't understand what you are telling me at all.

Mr. RISPOLI. The life cycle cost of our program, if you look at how long will it go and how much will it cost, is all estimated to the 80 percent confidence level.

Our budgets that we submit are budgeted to the 50 percent confidence level.

Our capital projects——

Mr. VISCLOSKY. Okay. For EM for 2009, are you only asking for half the money?

Mr. RISPOLI. No, sir. No. We are asking——

Mr. VISCLOSKY. I just don't understand what you are getting at.

Mr. RISPOLI. On our capital projects, we asked you for the 80 percent confidence level. That is what we are——

Mr. VISCLOSKY. Do you understand?

Mr. SIMPSON. I think so.

Mr. VISCLOSKY. You probably do.

Mr. RISPOLI. We are 80 percent confident that we can deliver the capital projects for the amount we asked for, capital projects.

For operating projects, which is the vast majority——

Mr. VISCLOSKY. Your confidence is 50 percent.

Mr. RISPOLI. Yes, sir. The amount we have asked for would get us to the 50 percent confidence level.

Mr. VISCLOSKY. Why the lack of confidence? I am just trying to think through this.

Once you know what your facility processing—I would assume there would be a greater level of predictability.

So much of what happens at the Department of Energy is unique when you start down that road. But once you kind of have your

program, I would assume there would be a greater level of predictability.

Mr. RISPOLI. I think what causes the uncertainty are the risk and the assumptions. For example, as an example, you could be working on a process that is going along fine and then, all of a sudden, let's say there is an unexpected rupture of a drum and you have to shut down the operation for 2 or 3 months while you recover and say what happened.

We had a case at Hanford recently where there was a spill of radioactive material out of a burst hose. We shut down the operation for months.

Those types of risks introduce the uncertainty and when you are budgeting for that, you have to allow for that uncertainty.

The question is do you want to say, "Hey, I have a 50/50 chance of making this cost and this schedule," or do you want to have the 80 percent confidence level.

All of the estimates we have take us to the 80 percent confidence level. But for the operating projects, we budget to the 50 percent confidence level.

For the capital projects, we do budget to the 80 percent confidence level.

Mr. VISCLOSKY. It is becoming clearer.

FUTURE CLEANUP SITES TRANSFER TO LEGACY MANAGEMENT

Mr. Owen, you have been very patient. I understand you are planning to receive eight sites in fiscal year 2010.

Are there any pension liabilities associated with these sites and could you explain?

Mr. OWEN. At 2010, sir, the site would have pension liabilities associated, where there would be the transfer from EM to LM of the Mound site at Miamisburg, Ohio.

Correct, none of the other sites would have pension liability. Just the Mound site in Miamisburg, Ohio.

That site has a worker population of 656 retirees, 787 additional deferred, but vested, potential retirees, for a total of approximately 1,400 people at about a total of 1,800 medical recipients at that site, because you have spouses and dependents.

Mr. VISCLOSKY. Fair enough.

Do you want to?

Mr. SIMPSON. Yes. I will let you drink, Mr. Owen.

Mr. OWEN. I thought they were going to back to you, Jim.

MONITORING WELLS IN NEVADA

Mr. SIMPSON. A couple of questions here.

Your fiscal 2009 budget request, $10 million for installing deep monitoring wells at the central Nevada test area site, is a fourth of your request for all long-term surveillance and maintenance activities.

I understand that given the depth of groundwater at the site, oil drilling techniques are required to be used.

While that explains part of the projected costs, I am still unclear why this activity has been given such a high priority in the LM budget.

How far will these wells be from population centers? Is this activity required by statute or is this an arrangement between DOE and the state of Nevada?

And although I think these are one-time costs, anticipated one-time costs, what are the ongoing costs associated with it?

Mr. OWEN. Yes, sir. One, when the Nevada offsites were transferred from Environmental Management to Legacy Management, in that transfer were targeted dollars for these wells to be drilled.

We are still working with the State of Nevada to determine just what is the most practical and needed means of drilling the wells. The wells are called for at the one site in a Federal Facilities Agreement and a consent order signed between the Department of Energy and the State of Nevada.

Some of the other Nevada offsites have configurations of wells, but each site is somewhat different.

This particular site is pretty isolated. It is pretty remote. So from that standpoint, there is no immediate population center that is very close to the site.

We want to and we have agreed with Nevada to confirm and continue to ensure that the way we have characterized the subsurface contaminants is indeed correct and accurate.

Whether or not it is actually one well or multiple wells, I think it will be probably multiple wells, maybe upwards to as many as three wells in that price tag.

Mr. SIMPSON. So it is the $2 million. If we don't know how many wells, is that budgeted—to what confidence level?

Mr. OWEN. I don't have the technical expertise to tell you if it is one or three. For some reason, in the back of my head, I believe they say that when they refer to that well drilling, it is actually three different shafts that would comprise the well.

CONSOLIDATED RECORDS FACILITY IN MORGANTOWN, WV

Mr. SIMPSON. Okay. Also, you are requesting funds to consolidate records in order to move them, in fiscal year 2010, to a new storage facility in Morgantown, West Virginia.

Currently, those records are at five federal records centers around the country.

Is this facility on track for being ready to receive the records in 2010? Was your budget request—is this a lease or, rather, a purchase? And how much will this be if it is a lease for a long-term lease and how much will be saved by consolidating these records?

Mr. OWEN. The proposed facility is on track at this time. We are currently awaiting a final offer from a developer through GSA. I believe that offer is scheduled in tomorrow, literally, and it apparently is going to be on time, and then GSA will analyze it to see the appropriateness of the offer.

We will have to pay some unique startup costs, in other words, unique equipment we will have to purchase with our funds and then the rest of the costs will be in a long-term lease, which I believe is going to be about $1.4 million per year.

It is a very standard leasing procedure that GSA has used to accomplish these projects for other federal agencies.

I will have to answer for the record, if I could, the actual—our cost estimated on savings over a number of years by consolidating at one location versus five. That all has been looked at.

COST SAVINGS FOR THE LEGACY MANAGEMENT RECORDS STORAGE FACILITY

A project alternatives analysis was performed by DOE–LM in early 2007 to compare life-cycle costs for several alternate approaches for fulfilling the approved mission need for a consolidated records storage facility. The selected approach was a long-term lease of a build-to-suit facility.

The estimated cost for a 25-year life-cycle of consolidating all the records in a build-to-suit leased facility would be $223.6 million. The life-cycle cost estimate for retaining the present situation with the records dispersed among five national archives facilities would be $251.7 million. The resulting cost savings, which are calculated based on a comparison between the costs of using five national archives facilities versus a consolidated facility would be $28.1 million.

Mr. SIMPSON. What is going to happen with the five facilities out there now?

Mr. OWEN. They are National Archives facilities, so they will continue keeping records for others. Our records are retrieved somewhat more often than others.

A lot of our records are medical records of former contract workers at the plants and they are pulled up for health surveying purposes.

But the five centers are currently part of the National Archives network.

TRANSFER OF ASSETS

Mr. SIMPSON. Okay. Thank you.

Jim, talk about transfer of assets. As you know, we have talked about transferring and when you look at EM's total liabilities out there, there are liabilities that aren't assigned to EM that are truly EM liabilities, but they sit under NE and other types of things.

So when we have talked about transferring some of those assets from NE to be more appropriately under the EM budget, and I understand why the department has some problems with that, while, philosophically, they agree with it, if you are going to transfer the assets and not transfer any money to handle those liabilities, you have got some problems.

What is the department doing so that we have a more accurate record of what our EM issues are out there and where they should be located?

Because I would rather have them under EM so I know exactly what they are, whether I transferred the money to actually deal with them or not, so that I know what I need in total EM dollars to address these, rather than having some maintained under NE, where I don't think they should be.

Mr. RISPOLI. Yes, sir.

Congressman Simpson, in August of 2006, a policy directive was issued with concurrence of EM, NNSA Science Nuclear Energy that basically says that EM will receive all excess facilities, including the contamination that goes with them.

We actually put out a call for those. Mr. Wamp talked about the IFDP. That is but one of them. With this complex transformation of NNSA, with NE at Idaho, basically, we have gotten responses from Science, from NNSA, from Nuclear Energy to a call that we

just put out late last year and we are now evaluating how to best incorporate these facilities and properties into the EM inventory.

What you may be referring to, though, is not included in that policy memorandum that was issued back in August of 2006, and that is nuclear materials that may be in the buildings as opposed to waste or contamination.

For example, if there are inventories of uranium or things like that, that is not really an EM mission to deal with products that are not waste or contamination.

So what we are doing with those is referring them to this nuclear consolidation committee that I mentioned. It has a long name. But it is headed by Bill Ostendorff, the principal deputy administrator, now. It used to be headed by Charlie Anderson.

And they will be looking at all of these non-waste type materials that are in the inventory of NE, for example, to determine what is the best way for the Department to handle those.

So if you follow the distinction, the real property, including the buildings and the grounds and any contamination clearly would come to EM as part of this protocol that we are working on.

What is not yet resolved is what will happen with the materials that are not waste, that could have a value to the nation.

Mr. SIMPSON. Will a final decision on this be made this year?

Mr. RISPOLI. My belief is a decision will be made on that this year. Yes, sir.

Mr. SIMPSON. Because if we don't, new administration and new Department of Energy, et cetera, et cetera.

Mr. RISPOLI. Yes, sir.

Mr. SIMPSON. That would be one of the important things I think we get done this year.

CONTINUED OPERATION OF H CANYON FACILITY

The DOE has announced plans to extend the operations of the H Canyon facility at Savannah River, to extend it to 10 years, to process spent nuclear fuel from the site's now shut-down reactors, spent nuclear fuel from foreign and domestic research reactors and surplus high enriched uranium inventories from throughout the complex and that have no other disposition pathway.

Operation of H Canyon is expected to cost approximately $200 million per year and this project is expected to cost upwards of $5 billion before H Canyon is scheduled to shut down in 2019.

DOE justifies the project, in part, by citing the Floyd D. Spence Defense Authorization Act of fiscal year 2001 and 2004, which requires the department to continue operations and maintain a high state of readiness at H Canyon.

The Department of Energy invested a lot of money and time in developing environmental impact statements under the last administration to identify disposal pathways for spent nuclear fuel.

In the example of aluminum clad fuel, I believe the record of decision was to can it and send it to Yucca Mountain.

Why has the department decided to reprocess it now?

Mr. RISPOLI. I think that the answer to that is that as the value of uranium has gone up, that it puts the uranium inventory the department has into a different perspective.

And, yes, you are correct, with the—I think it is Public Law 107—no, maybe it is not 107–107, but the law that says we must operate H Canyon. But, in fact, that Canyon is the very last what I would call chemical process capability in the inventory that can do this type of a thing.

And, for example, the clad fuel from Idaho would go to this Canyon to be processed.

We believe there is great value in retrieving that. We actually have, as part of the working plan, an actual map that shows what uranium products could be processed through H Canyon, from where and where they would go, and I actually have that with me that I can share with you, if you like, after the hearing.

Mr. SIMPSON. Okay. Is the department using it just because it is available or because it is the least cost option?

Mr. RISPOLI. The Department is using it for a couple of reasons. One is that it has the capability to process both uranium and plutonium, and, secondly, it does give us a pathway out of the state of South Carolina for the plutonium that is being brought into the state.

As you know, from several sites, Los Alamos, from Hanford, from other places, we are now actively shipping plutonium to the state of South Carolina.

This Canyon, along with other facilities that are there at South Carolina, will give us the capability to take that plutonium and disposition it so that it doesn't reside in the state of South Carolina, but actually has a pathway out.

Mr. SIMPSON. Under the agreement with South Carolina, do you have to have a disposal path for it to bring it in?

Mr. RISPOLI. That is public law and I think that is 107–107. That is Public Law 107–107.

Mr. SIMPSON. What are the capital improvements that will be required to continue the H Canyon operations for a decade?

Mr. RISPOLI. I have been in dialogue with the Defense Nuclear Facilities Safety Board. They have had questions of us on that. They have actually gone to review the facilities we have.

I believe this subcommittee may know something of that. They believe that the facility is safe, that you would have to do upgrades, what I would call, of a normally expected nature to take a 1950s facility.

But this facility has been upgraded over the years anyway. So it is not as though it has been in a time warp since 1950.

We actually have a business case on it called the H Canyon business case. We have had that reviewed by three outside experts, not from the government at all, and they believe that, if I could use their words, that "use of the H Canyon is like an open-and-shut case."

This is very clearly an asset to the nation to use this. And that business case is available or is not available?

It has been provided.

Mr. SIMPSON. Is the operation until 2019 and then closure, is that a firm date or is that—why 2019?

Mr. RISPOLI. Sir, I would have to take that one for the record. I just don't recall the answer to that. I would think it is in the business case, but I don't recall.

Mr. SIMPSON. Do we have a disposal path for other spent nuclear fuel the department might take in after 2019?

Mr. RISPOLI. I understand the question. I will have to take that one for the record, sir.

SPENT NUCLEAR FUEL DISPOSITION PATH

The spent nuclear fuel within the scope of the Enriched Uranium Disposition Project is based on the current inventory of aluminum-clad spent nuclear fuel and estimated projection of future receipts and spent nuclear fuel to be generated by the Department. Should additional aluminum-clad spent nuclear fuel and surplus special nuclear materials above and beyond the current scope be identified in the future, the Department would need to evaluate possible disposition paths for these materials and determine the viable and cost-effective options, including operating H Canyon beyond 2019, The Department will continue to evaluate this situation as developments occur during the next several years.

Mr. SIMPSON. Okay. Mr. Chairman.

MANAGEMENT OVERSIGHT OF HANFORD WASTE VITRIFICATION PROJECT

Mr. VISCLOSKY. Mr. Rispoli, I would like to turn to Hanford at this point in time and I don't know the exact date it came over to this subcommittee, but it now stands a decade, and asked the staff to pull the House report from fiscal year 1998 and would like to just read a portion of that.

"The Committee has some additional concern about the Hanford waste vitrification project. The success of the project also rests on the ability of the department to provide high level waste from the Hanford waste tank farm to meet the waste specifications of the vitrification plant.

There is a concern that the department is focusing so specifically on the contract for the vitrification plant that the integration of the entire waste tank system may be overlooked."

And there were specific dollar figures and other verbiage and, to this day, it sounds, I must tell you, unfortunately, very familiar.

Several years ago, under the chairmanship of Mr. Hobson, in another report, in this case, a conference report, there was also language about the high level waste vitrification program at Hanford and its long history of failure.

Reasons for the increases in funding include contractor estimating problems, technical problems in sufficient project contingency, and it is unclear what steps DOE will take to better ensure effective management.

That was more than 2 years ago.

And so I will now ask about Hanford.

The GAO issued a report on DOE oversight of contractor payments at the Hanford waste treatment plant in July of last year, at the request of this subcommittee, and wouldn't characterize it as flattering.

According to the GAO, DOE did not adequately oversee the contractor to ensure accountability for assets purchased with waste treatment plant contract funds, relying primarily on the contractor to manage government property.

GAO found little to no review of contractor invoices or supporting documents for the $40 million to $60 million in charges that Bech-

tel billed to DOE each month to help ensure the validity of these charges.

And quoting from the report, "These internal control weaknesses over property, coupled with the lack of DOE oversight, created an environment in which government property could be lost or stolen without detection."

Mr. Rispoli, the WTP project is five construction projects, all in some form of construction mode at the same time.

Is it true that DOE did not assign a property administrator dedicated to the project until June of 2006, over 5 years after rewarding the contract?

Mr. RISPOLI. Mr. Chairman, we did review that report. I don't know if there was never a federal employee, but I do know, at the time of that report, there was no federal property, personal property expert assigned to that particular project.

Since that report was issued, we have hired not only a competent federal employee, but Bechtel has hired 10 employees, 10, to keep track of the personal property that is basically bought for the project and dispersed throughout the various very large construction sites.

So the report is valid. I would not dispute that. I think we have taken the corrective actions that we had to take and I think they were appropriate, and I think the GAO report was correct in pointing that out to us.

WASTE TREATMENT PLANT CONCERNS

Mr. VISCLOSKY. Two years ago, you were here when the subcommittee had an oversight hearing on the Hanford waste treatment plant, which experienced several cost overruns, from $4.3 billion in 2001 to over $12.3 billion in fiscal year 2008.

And I would like to revisit the status of the WTP, because I am still concerned regarding the management of the project.

The waste treatment plant, as I understand it, is composed of five facilities—a pretreatment plant, which receives waste from the tanks and then sends the pretreated waste to either the high level waste vitrification facility or the low level waste vitrification facility, known as the low activity waste facility.

And the two other construction efforts are an analytical lab and a balance of facilities activity, such as a steam plant and water treatment activities.

Am I correct in that understanding as far as those activities?

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. And that does not include the bulk vitrification plant.

Mr. RISPOLI. That is correct.

Mr. VISCLOSKY. On the issue of treating waste, what is the total cost of the low activity waste facility?

Mr. RISPOLI. The low activity waste facility portion—and I could always confirm this for the record, but I believe the capital cost of it is about $1.1 billion, in that range.

Mr. VISCLOSKY. And that is just the cost of construction.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. And you can specifically answer it for the record, I understand.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Giving us an estimate.

When will the low activity waste facility be completed and ready for operation?

Mr. RISPOLI. The low activity waste facility could be ready for operation as early as 2014.

Mr. VISCLOSKY. And when will the pretreatment facility be constructed and begin sending waste to the low activity waste facility?

Mr. RISPOLI. If you recall, Mr. Chairman, we actually stopped construction for a couple of years on the pretreatment facility and the high level waste while we worked through the technical issues and the seismic issues.

So that was kind of like the critical path delay that will get us to not before—2019 is what it is projected to be for the pretreatment facility.

Mr. VISCLOSKY. So there will be a gap then between when——

Mr. RISPOLI. About five.

Mr. VISCLOSKY. About.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Can you explain what happens to a facility that is completed and it is not going to be used, or am I incorrect about that, for 4, 5, 6 years?

Mr. RISPOLI. We have a report, a study that has been done called "Early Low Activity Waste" that would actually bring this plant online in 2014. That report, by the way, is publicly available. It is on both the DOE website and an Office of River Protection website.

But we have basically looked at the options to bringing the low activity waste plant online early in 2014 so that we could actually begin to process liquid tank waste at the Hanford site.

Mr. VISCLOSKY. And you wouldn't need the pretreatment facility to do that.

Mr. RISPOLI. It would not have the capability that it would have after the pretreatment facility was installed. So what we already have in the cost and schedule baseline for this project, for the tank farm portion of the project, is an interim pretreatment capability that could provide feed to the low activity waste treatment plant to let it be in operation as early as 2014.

Mr. VISCLOSKY. How much of the tank waste will the low activity waste facility be able to handle once it is operational and once the pretreatment facility is operational?

Mr. RISPOLI. I was given a correction on the number of low activity waste as being 1.7 billion, not 1.1 billion. So we will still confirm that for the record.

LOW ACTIVITY WASTE FACILITY

The Low Activity Waste facility ($1.748 billion) is projected to immobilize about 50 percent of the low activity waste, depending on Waste Treatment Plant performance.

Mr. VISCLOSKY. Yes.

Mr. RISPOLI. The plant is actually sized and has been sized, since I was first introduced to it, such that if it all began on the same day, the plant would be able to process all of the site's high level waste, vitrify all of the high level waste into glass canisters to go

to Yucca Mountain national repository, but only 50 percent of the low activity waste that would be kept onsite.

And the reason is that the plan was and still is to look at what other technology could be used——

Mr. VISCLOSKY. Can I stop you right there?

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Because it only handles 50 percent, you have to look at that now.

Mr. RISPOLI. Yes, sir, that is correct.

Mr. VISCLOSKY. Why did the department start a program and go to all the trouble and design and begin construction of a facility that is only going to take half the waste and then have to sit here—when did they decide to build a lower activity waste facility, what year?

Mr. RISPOLI. I can't answer that, Mr. Chairman. I would take that for the record.

CAPACITY OF THE WASTE TREATMENT PLANT LOW ACTIVITY WASTE FACILITY

The record of decision for construction of the Waste Treatment Plant was published on February 26, 1997. The decision then was to build a Phase I plant and the award for the plant was in December 2000. This Phase I plant was to be capable of treating 10 percent of the tank waste by volume and 25 percent of the tank waste by activity in about 10 years. It was designed to operate for 40 years, so was capable of treating 40 percent of the tank waste. The Phase I plant was to "verify that the treatment processes would function effectively." It was anticipated that the remaining 60 percent of the waste would be treated in a larger Phase II plant over 30 years.

Subsequently, testing has resolved much of the early uncertainty in the effectiveness of process operations. The Phase I plant design was revised in 2003 to increase the capacity to immobilize the entire high activity fraction of tank waste in the Phase I plant. Additional capacity for immobilization of the larger volume of low activity fraction waste was also needed. Thus, alternatives for supplementing what began as the Phase I plant in order to treat the remaining low activity waste have been considered.

The original need for including the treatment of the high level waste fraction in a Phase II plant has now been eliminated by increasing the throughput of the Waste Treatment Plant. Using supplemental treatment we estimate the total cost to treat the remainder of the low activity fraction will be only about 20 percent of the current Waste Treatment Plant capital cost, much less than the previously envisioned cost to build and operate a large Phase II plant.

But I have known it to all be part of the same integral project from the beginning.

Mr. VISCLOSKY. Two, 3 years ago?

Mr. RISPOLI. No, sir. This goes back to the earliest—even during the Clinton administration, conceptually——

Mr. VISCLOSKY. I just think this is fundamental, myself.

All those years have passed and they designed a waste treatment facility for half of the waste. And here we are, I read a committee report from 10 years ago, thinking about how we are going to deal with the others.

How could you—you weren't there. How could you do that? How could the department do that?

Mr. RISPOLI. The reason is that——

Mr. VISCLOSKY. What was the thinking?

Mr. RISPOLI. The reason is that the low activity waste, when it is eventually processed, by whatever method, would be disposed of onsite.

So, for example, at Savannah River right now, the low activity waste is being put into—its fancy name is saltstone, but it is really a grout.

At Idaho, it is being put into a powder type of a form. There are various forms it could be.

And it was believed that there could be another supplemental treatment that might even be cheaper than a low activity waste plant.

Mr. VISCLOSKY. That is what they believed then.

Mr. RISPOLI. Yes, sir. That is true.

Mr. VISCLOSKY. So if they thought there was a cheaper way, why didn't they do the cheaper way instead of going halfway down one road and, 10 years later, we are still thinking about a cheaper way now?

BULK VITRIFICATION

Mr. RISPOLI. The current estimate range that we have, if we were to build bulk vitrification as a supplemental treatment, would be a capital cost of about $600 million compared to a second low activity waste treatment plant, which would cost about $1.1 billion.

Mr. VISCLOSKY. No, I am talking about before. It may be lower cost today. Did they know that 10 years ago? I mean, what were they thinking about?

Mr. RISPOLI. I think they believed, 10 years ago, that by looking at supplemental technologies based upon how they knew them then and in discussing with regulators what the possible options would be, because it generally has to be acceptable to them, that another way could be found to treat the balance of the low activity waste that could be more cost-effective for the balance.

They could be treated with——

Mr. VISCLOSKY. Which leads us to bulk vit today.

Mr. RISPOLI. Yes, sir. But, again, bulk vit would not be capable of handling the same types of waste that the low activity waste——

Mr. VISCLOSKY. We are going to get to that.

Now, bulk vit, is that under construction today?

Mr. RISPOLI. No, sir.

Mr. VISCLOSKY. That is still a concept.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Now, bulk vit, and you talked about the potential cost estimates and the fact that you have got 50 percent of the waste, but the type of waste varies.

Was bulk vit decided upon because of a renegotiation with the state and others because of compliance issues and requirements to deal with the waste?

Mr. RISPOLI. I will have to take that for the record, Mr. Chairman. I don't know why specifically it was looked at as a viable technology.

BULK VITRIFICATION DECISION

There has been no decision yet or selection of a preferred supplemental technology for low activity waste immobilization. Bulk vitrification is among several technical approaches judged to be potentially most effective considering a broad spectrum of criteria by a series of expert panel reviews done since 1999. The planning basis for low activity waste immobilization is vitrification or a waste form "as good as glass"

per the Washington Ecology clarification of their position on the form for on-site disposal in their letter of April 25, 2003.

The Department will commit to a supplemental low activity waste treatment decision once the Tank Closure and Waste Management Environmental Impact Statement, as required by the National Environmental Policy Act (NEPA), is completed in the fall of 2008. However, we will select a preferred alternative for planning and funding of development by the summer of 2008, before completion of the NEPA process.

I do know that they were looking at grout at Savannah River. They were looking at a powder type form at Idaho and they looked at bulk vit as a form in Hanford.

But I don't know the driving reason from back at that time.

Mr. VISCLOSKY. I would like an answer to that, because it gets back to my earlier comments about compliance, is that people are renegotiating these under—and I understand the state pressuring the federal government to deal with this.

I mean, if I am the state of Washington, I am pressuring you if you are building a facility to deal with half the waste. If you are starting down a road you are only building a facility to deal with half of the waste, I am pressuring you to do something.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. And then if it is part of that renegotiation, now we are stuck paying for bulk vit.

The next question is, okay, you have got 50 percent, you have got bulk vit. Are you pursuing other technologies to address additional low activity waste at Hanford?

Mr. RISPOLI. Yes, sir. We are looking at other things that can——

Mr. VISCLOSKY. Why?

Mr. RISPOLI. For example, we are looking at an——

Mr. VISCLOSKY. Why? Because bulk vit doesn't take care of the rest of the other half of the 50 percent?

Mr. RISPOLI. Bulk vit would indeed take care of the other 50 percent.

Mr. VISCLOSKY. So why do you need the other?

Mr. RISPOLI. The other options would be to build a second low activity waste treatment building or——

Mr. VISCLOSKY. Why?

Mr. RISPOLI. To process the balance of the low activity waste.

Mr. VISCLOSKY. I thought you had 50 percent and vit takes care of the other half.

Mr. RISPOLI. It would. If we were to do——

Mr. VISCLOSKY. I come up with 10 percent. I mean, I didn't understand the other one at all, but I am coming up with 100 percent here.

Mr. RISPOLI. If we were to do nothing, if we were to do nothing at all, other than build a Waste Treatment Plant, we would not finish processing the tank waste until approximately 2079.

Mr. VISCLOSKY. Okay, wait. Hold on. However, add bulk vit.

Mr. RISPOLI. But if we add bulk vit, we project we could finish by 2046.

Mr. VISCLOSKY. Okay, 100 percent.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. So why are you doing the other ones, to accelerate that process?

Mr. RISPOLI. If we don't do anything, if we provide——

Mr. VISCLOSKY. If you do bulk vit.

Mr. RISPOLI. If we do bulk vit, we would finish, projected, in 2046, all of the tank waste.

Mr. VISCLOSKY. And you are done.

Mr. RISPOLI. And we would be done.

Mr. VISCLOSKY. In 2046.

Mr. RISPOLI. Yes, sir. If we don't do anything, it would be until 2079.

Mr. VISCLOSKY. Right. But you are pursuing bulk vit. But I am asking about now the third option.

Why the third option if you can deal with 100 percent and you have a deadline and you know you can be done then? Why the extra cost?

Mr. RISPOLI. The extra cost of bulk vit?

Mr. VISCLOSKY. No, no, no. You are building a third facility now.

Mr. RISPOLI. No, no, no. The third facility—I am sorry, I am missing it.

Mr. VISCLOSKY. You are building a new low activity facility.

Mr. RISPOLI. No, sir.

Mr. VISCLOSKY. What is your third option? Are you building a second low activity waste facility?

Mr. RISPOLI. What you may be addressing is we intend, as part of the cost and schedule, we are looking at building an interim pretreatment facility to service the bulk vit facility.

Bulk vit can process only about two tanks with no treatment whatsoever. To process more than two tanks of waste, it would need some other form of pretreatment, we believe.

So I have asked, again, for another—to take this the next step and by this summer to have the full business case presented to me to show what is the best alternative.

In other words, should we go ahead with bulk vit the way it was originally planned and envisioned? Should we build or not build an interim pretreatment? Is it necessary or not?

And we should have the answer to that this summer. And I think that is what you are getting to. The other facility you are, I think, referring to is an interim——

Mr. VISCLOSKY. Is an interim second pretreatment facility.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Because the pretreatment facility, as designed, doesn't have enough capacity.

Mr. RISPOLI. Will not be online until 2019.

Mr. VISCLOSKY. Right. But you are saying, under your current scenario, with nothing else changed, you still complete 100 percent in 2046.

Mr. RISPOLI. We would not complete, if we do nothing else, until 2079. We have to have some supplemental technology to complete in 2046.

Mr. VISCLOSKY. I thought you just told me if you have the low activity waste facility and you do the bulk vit, you are done by 2046.

Mr. RISPOLI. I did say that.

Mr. VISCLOSKY. But if you don't have the bulk vit, then you can't complete until 2070 something.

Mr. RISPOLI. That is right.

Mr. VISCLOSKY. Okay.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. But now what you are saying is on the front end of this, we don't have enough pretreatment capacity to feed the low activity waste facility and bulk vit.

Mr. RISPOLI. We will not have a pretreatment capacity until—because it was the one that is the most complex and the most—we stopped construction on it.

It will not be ready until 2019. So in order to begin processing waste early in 2014, we would need to use bulk vit, which could handle, we believe, based upon what we know, two tanks.

But in order to increase the amount of tankage that could go through bulk vit, we would need an interim pretreatment capability.

Mr. VISCLOSKY. Because you, even though bulk vit isn't under construction, can complete that earlier.

Mr. RISPOLI. Yes, sir, that is correct.

Mr. VISCLOSKY. And you need an interim pretreatment for bulk vit. You essentially need to—but in the end, by the time I am at 2018, I have got two pretreatment facilities now.

Mr. RISPOLI. By 2019, yes, sir.

Mr. VISCLOSKY. 2019.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Which gets me back to my earlier comments and frustration and anger. I mean, this is somebody's money.

Who thought this up? And now we are left holding the bag here.

And let me ask you, is there some legal requirement that bulk vit can't wait until 2019 with the pretreatment and you are simply deferring?

I don't live in the state of Washington, but you are deferring before we now hit the taxpayers with another construction project at DOE that, I am guessing, the odds are less than 50/50 is going to come in on cost estimate or on time.

Mr. RISPOLI. I understand your question. But you hit the answer exactly and that is that if we didn't begin until 2019, bulk vit could only handle approximately two tanks without some form of treatment, for the balance of the tanks we would like to send to bulk vit.

Mr. VISCLOSKY. So who do we punish? What agreement do they have with the state of Washington as far as the end, the time? What is the agreement?

Mr. RISPOLI. Well, obviously, we have long missed the milestones that would have been the original milestones.

Mr. VISCLOSKY. So we continue to renegotiate——

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY [continuing]. New construction projects for new pretreatment plants and the interim pretreatment plants and bulk vit plants, and we are still looking at 2046.

What confidence does the subcommittee have that if you proceed with an interim pretreatment facility, that is, from what I understand, going to be finished before the one that is already under construction——

Mr. RISPOLI. That is right.

Mr. VISCLOSKY [continuing]. Or the bulk vit plant that is not under construction, but is going to be done before the low activity vitrification plant is done, that is under construction, what confidence do I have that you have got two that are already—one is going to sit there for 6 years, although you are claiming you are going to use it.

You have two projects that you haven't even started yet, one of which you are thinking about, are going to be completed before 2019, on time, on—and do we have any estimate today as to what that interim pretreatment facility is going to be, how much it is going to cost?

Mr. RISPOLI. Yes, sir. That is why I indicated that we have a—the next step to the study that has already been published is to help us make that business decision, look at the risks, and I expect that in the June timeframe.

Mr. VISCLOSKY. Let me ask you this, Mr. Rispoli. If you ever get the money for the interim pretreatment facility, if you get any more money, that is, what confidence does Mr. Simpson, any of us have that someone is not going to be sitting here 2 years from now, "Well, you know, we have been talking to Washington and, well, you know, this interim pretreatment thing, because it is a concept and it is new technology and now we realized there is another problem with bulk vit," that you are going to, "Well, we need an interim Part B pretreatment facility with a smaller bulk vit, while the other one"—what confidence do we have that you are not going to come back with part five within 2 or 3 years?

Mr. RISPOLI. And I have the same question, which is why I have asked for an independent, outside review of what we have got so that we can make the best decision in the June timeframe, this summer.

I mean, I have the same question you do. How do we know that this is the right way to go? And we do not want to make that decision unless we have vetted it and we are confident.

Mr. VISCLOSKY. Maybe if the contractors, nobody got any money for a year, they would pay attention and really would get serious about things.

I read a committee report from 10 years ago. It is the same story today in that we are thinking about building a pretreatment facility that is going to be done before one that is under construction today, that is going to be done in 2019.

It boggles my mind.

Mr. RISPOLI. I understand.

Mr. VISCLOSKY. And it frightens me to death from a fiscal standpoint.

Mr. RISPOLI. I understand.

Mr. VISCLOSKY. Frightens me to death. And it does get back to this issue of the renegotiations and, again, I understand the urgency. We talk to the Washington members all the time, I understand, but that people are making these agreements and there is a lot of money being spent.

Mr. RISPOLI. Well, it is also correct, Mr. Chairman, that the objective is to meet the milestones, but I also believe it is absolutely true that the tank waste is a high risk activity and we have got to get rid of it.

And so whether or not we had milestones, which we really want to endeavor to meet, this is not something we want to leave in those tanks until 2079.

We, obviously, are trying to make the right decisions to prudently get on with it, and I will have much more and be happy to get back with this committee when we have that study and share it with you.

But we expect that in the June timeframe.

Mr. VISCLOSKY. But that is just like this is catch-22. This is catch-22. If we don't do anything, well, there is a penalty and there is such an abysmal track record out here at Hanford.

There is speculation we are going to build another facility and I have no confidence, even if it all turned out that somebody is not going to come back, "Well, you know, we are still short that last 15 percent here, still short."

ENVIRONMENTAL IMPACT STATEMENT FOR GREATER THAN CLASS C WASTE

If I could turn to your office's preparation for the environmental impact statement for greater than Class C waste.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Your office is responsible for that, as I understand it, the impact statement.

The GNEP program, waste volume accounts for 625,000 cubic meters of waste or about 93 percent of the total waste volume included in the EIS.

Can you explain why the EIS is going to address the GNEP waste when Congress has not appropriated any funds to build an operational GNEP facility?

Mr. RISPOLI. Yes, sir, I believe I can. I have shared this with your staff. Perhaps I could have someone bring it up to share with you and Mr. Simpson.

We were tasked with doing the EIS for the Greater Than Class C waste by Congress and we have already expended a significant amount of effort on that particular project.

If you look at the chart I have just given to you, what we have expended our effort on so far is only in the leftmost tier. In other words, it is 4,300 cubic meters, if you see that here in the leftmost here.

In addition, there are two other either known or projected sources of Greater Than Class C waste.

The middle tier, that you see as tier two, includes waste from West Valley, the state licensed disposal area, and also for new reactors that we now envision the country would build, as well as greater than Class C like waste totaling 26,000 more cubic meters that would come from an advanced fuel cycle facility.

The pure GNEP part is in the right-hand most tier, which would be—you see the amount is enormous, 600,000 cubic meters. Our NEPA organization now resides within general counsel. They advise us that if we do not consider tier two quantities, the middle column, in this EIS, we would jeopardize the entire EIS.

So the current approach we are taking is to include tier one and tier two, but not include the quantities in tier three and, in fact, make it severable. So that as we go forward with the EIS, if GNEP

does not go forward, that entire portion could be severed from the EIS.

Mr. VISCLOSKY. So it is not integrated, it is severable.

Mr. RISPOLI. It would be severable. In fact, the quantity itself of 600,000 cubic meters would not even be addressed, because it is so huge that it would greatly change where the stuff could go.

So it would be not only severable, but we would not address the actual quantity, but rather just, if it goes, it would have to be considered at some point.

Our counsel advises us this is the only way they know to protect the EIS process, because NEPA requires that you not have severable—you not sever certain aspects of the same EIS.

So they believe that this will let us get started and then at the appropriate time, if we need to shed this, it can be severed and we can go forward.

Mr. VISCLOSKY. On tier two, in the bottom green box, you highlight the advanced fuel cycle facility 25,000.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. That is part of the GNEP program, too, as I understand it. Why would it not be also in the far right column?

Mr. RISPOLI. My understanding is that the advanced fuel cycle initiative—and it is not my program, I could be understanding this incorrectly—is required whether or not GNEP goes forward.

Now, I have read excerpts of the hearing with Secretary Bodman. I understand this subcommittee's concern about the advanced fuel cycle facility. I understand the distinction you are drawing between studies and design and design and construction.

But notwithstanding any of that, the view that the department has is that if we don't include this, since it is a well known entity, that as soon as we progress with an EIS without inclusion, we will be challenged in the courts and the entire EIS would be in jeopardy.

Hence, the approach that has been recommended to me, which I have shared with staff here before this hearing.

SALT WASTE PROCESSING FACILITY

Mr. VISCLOSKY. Mr. Simpson, did you ask the question about the Salt Waste Processing Facility at Savannah River? If you didn't, I would want to do that.

Mr. Rispoli, successful completion of the Salt Waste Processing Facility is vital to ensuring continued availability of space in the Savannah River site underground high level waste storage tanks, as well as feed for the DWPF in a saltstone facility.

However, design and construction of the Salt Waste Processing Facility has been delayed and the facility is not projected to be open until 2012 or 2013.

What is the status of the interim salt processing facilities at Savannah River and do these facilities have sufficient capacity to continue to indefinitely provide feed to the saltstone project and the DWPF?

Mr. RISPOLI. Mr. Chairman, there are interim facilities. In fact, one of them, the one that simply did a mechanical process of dissolution, it completed its mission and has been finished.

The next two components just went through their operational readiness review and are ready to begin their processing.

As far as all indicators are, those are on schedule and capable of performing as intended.

I don't have one to share with you this moment, but we have developed an in-and-out chart that shows what quantities go into the tanks and what quantities come out of the tanks at Savannah River.

It goes through the entire life cycle of the project. It shows when the Salt Waste Processing Facility comes online.

We have already brought the inventory down from about 36,500,000 gallons down to, in fiscal 2008, 36 million gallons. By 2009, we should be at 33.9 million gallons.

This shows both incoming and outgoing fluids from those tanks.

All of this depends upon the interim processing and then, at the appropriate time, Salt Waste Processing Facility comes online in the 2013 timeframe.

I would point out that even that 2013 timeframe has 60 months of schedule contingency. Recall, I had mentioned you have the best case and the worst case.

This table assumes the very worst case. A 60-month contingency is included, schedule contingency, and it still shows that we can avoid a capacity issue at the tanks at Savannah River with the interim and with the Salt Waste Processing Facility coming online.

Mr. VISCLOSKY [continuing]. Because of funding or what we talked about earlier?

Mr. RISPOLI. No, sir. This is a very significant issue. Basically, it is not so different than what we encountered at Hanford with the Waste Treatment Plant. We had seismic issues that, if considered appropriately, are protective of the workers and the site and the environment.

And by us directing the contractor to include those seismic considerations, we essentially resulted in a schedule that now causes the need for the interim processing that we have.

I think the good news to the story is that the interim processing that we have already deployed has worked. We did do a Section 3116 determination and have been providing material to the saltstone facility, the grout facility, under NRC oversight, as you know.

The new steps have gone through their operational readiness review. The next interim steps are built and are ready to go and they will cover us until the Salt Waste Processing Facility comes online.

So we believe that we are on a very solid path to managing the tank waste appropriately.

TANK INVENTORY CAPACITY

Mr. VISCLOSKY. And what is the approximate compliant tank inventory capacity today?

Mr. RISPOLI. The tank capacity is about 37 million gallons, plus a one million gallon cushion. So it would be about 38 million gallons.

And the chart I have shows that for fiscal 2008, that we would finish fiscal 2008 at 36,020,000, down from 36,500,000.

So we are bringing the inventory down.

Mr. VISCLOSKY. Here is my chart, and this is an older chart. I have got one visual for you and this is old. This is June 30, 2004. And the white scheme on the top shows the available tank space.

In relative terms, obviously, it looks like a small margin of error.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. Do you have confidence that there is going to be enough capacity as we proceed here?

Mr. RISPOLI. Well, clearly, this is still a small margin. I mean, with 37,000 plus a million for reserve, and here we will wrap up 2008 at 36—I am sorry—37 million, with a million in reserve, we will wrap up at 36 million.

This clearly takes careful management. I would say that with the work of our contractor, the work of our federal workforce oversight, we are bringing it down, which is at least going the right direction, and there is nothing in this projection that shows the inventory will go up.

It is all in the right direction.

Mr. VISCLOSKY. But you admit it is a small window.

Mr. RISPOLI. Yes, sir.

Mr. VISCLOSKY. If something goes wrong with the tank capacity, what happens to the overall project?

Mr. RISPOLI. Well, we need that tank capacity in order to continue the retrieval operations, the processing of the vitrification plant and so forth.

So, clearly, we have to keep a sharp eye on this and make sure that we continue to do this saltstone processing for the low activity waste.

Mr. VISCLOSKY. Can I ask, if there is that margin, does it make sense to keep adding more material to the tanks from H Canyon? You are claiming that the capacity is continuing to increase.

Mr. RISPOLI. The vitrification plant puts into H Canyon about two million gallons per year. Just washing the canisters and things of that nature puts in one million gallons per year.

The H Canyon operation puts in only 300,000 gallons per year. So the quantity is very small compared to other inputs into the tank farms at Savannah River site and this projects the continued use of H Canyon.

So it is one-tenth of just—nearly one-tenth of just the recycling from the vitrification plant, which is two million gallons per year by itself, whereas H Canyon is 300,000 gallons per year.

So we are aware of all these things and that is the reason why we have developed this input or inflow-outflow to be sure that we are managing the waste appropriately.

Mr. VISCLOSKY. Mr. Rispoli, thank you very much.

LOS ALAMOS NATIONAL LABORATORY CLEANUP

Mr. SIMPSON. Who is responsible for the cleanup at Los Alamos, your office or the NNSA?

Mr. RISPOLI. We are responsible for the budgeting, the strategy. The oversight of the contractor is the responsibility of the NNSA. The actual contractor is the NNSA contractor, called LANS, the Los Alamos National Security Consortium, that is the university with Bechtel.

So the day-to-day operations are done by the NNSA under their management. We fund the staff for the environmental management program, but they are managed, because of the NNSA Act, by the NNSA.

Mr. SIMPSON. So how much oversight do you actually have over it and what is your responsibility other than just budgeting?

Mr. RISPOLI. We work very closely. I mean, this is a regular topic of conversation seriously, maybe once every week or two, between myself and Administrator D'Agostino.

I have met now Mr. Bob Smolen, the new Deputy Administrator for Management of the laboratory. We coordinate this very closely with their environmental group within the NNSA, regular meetings with them.

Essentially, if you think of it this way, we provide the staffing—and, by the way, they are plussing up their staffing. They are woefully short of staffing.

Mr. George Rael is their environmental manager there, the fed in charge. He is a tremendously capable individual. But I believe at one point he had a staff of only three to do our work.

I believe he is hiring another 10 people, but I met with him 2 weeks ago, he is having great difficulty in attracting people to the Los Alamos area. It is very, very difficult, I understand, because of its geographic location, the cost of living and all those things.

So we are taking the right steps. When I mention that we did this nationwide survey of our sites using the Army Corps, we plugged in some contractor people. I think—is it five? Does he have five? Do you recall?

We have plugged in a number of support to him in the interim to help him out. I think they are on the right path to get themselves properly staffed to manage the contractor.

So we work very closely together, Mr. Simpson. I don't know if that has answered your question.

Mr. SIMPSON. DOE is requesting a quarter of a billion dollars for cleanup activities at NNSA sites.

How does the risk at these sites compare with non-NNSA sites?

Mr. RISPOLI. We use the same basic approach, to a risk management—risk reduction, rather. So we look at the highest priorities first.

Los Alamos, the baseline that was the cost and schedule estimating that was done for them that we just finished, it was one of the last ones that we finished, would, in fact, require significantly more money than we presently have available for them, but it is such a new cost and schedule baseline that you really couldn't reasonably jump to the level that would be required.

We were funding them at $140 million a year. I think in 2008 we went to $154 million, in 2009 $164 million. If you were to look at the independently reviewed cost and schedule, you would need double that.

But it isn't reasonable to think that you could go this way and then go like that and the money could be effectively used. So our intent is to continue to ramp the funding resources provided to Los Alamos—

Mr. SIMPSON. How reliable is that baseline that you are talking about with Los Alamos compared with other sites that we have?

Mr. RISPOLI. It has been audited to the same degree of rigor. I will tell you that it has taken, I think, at least 3 years to get all of the issues addressed, to be sure that we have the same degree of confidence.

So I won't mislead you. I mean, it took a lot of work. They have had a change in contractor. There has been a change in personnel. I think they are now on the third manager since I have been in this position on the contractor side.

So I think we have now reached the point that we have a pretty high degree of confidence, very comparable to the rest. It is just that we would have to ramp the funding up significantly to get to what it would take to meet all of the compliance agreements that have been negotiated with the state out there.

Mr. SIMPSON. So we are going to see, in future years, continued increases in that budget.

Mr. RISPOLI. Well, we are in the 2010 budget cycle right now. I haven't really, myself, seen what we are looking at, but the same risk management approach and focus on risk reduction would apply as we develop the Los Alamos budget.

It is a significant issue there. I mean, they have groundwater issues that are threatening the drinking water aquifer. I mean, it is not—we have significant transuranic waste that is stored both above ground and below ground.

And when they went through the Cerro Grande fire a few years ago, they were very concerned about the hazard to not only the installation, but to the community at large, that could jeopardize really the national security of the country because of the importance of that lab.

So, clearly, we have some work to do to get that situation where we need it to be.

RISK REDUCTION BUDGETS

Mr. SIMPSON. The reason I ask that is I am looking at the out years here and we are looking at ramping up Los Alamos significantly and then I am looking at your proposed 5-year budget, which ramps up slightly, somewhat, over the next several years.

Does that mean that the other sites are going to be looking at budgets that continue to go down as we are taking on additional responsibilities?

Mr. RISPOLI. I think that the real challenge for us is recognition that to meet all the milestones at Hanford alone, just the milestones, if we were to try to cover all those, would be, in 2009, half a billion dollars.

And Hanford, meanwhile, when the EM budget went up from the beginning of the Bush administration, it was about $1.2 billion, and it grew to nearly $2 billion, nominally, it never came back down.

So the question that we will have to deal with is, looking at the relative risk, what is the latitude we have to look at Hanford issues, because a half a billion dollars would go, obviously, a long way in anybody's budget.

And so the approach we are taking is to look at the relative risks, but also, now, with this capability to look at the individual work elements, we can even look at it, from a business sense,

would it make sense to get something out of the way and be done with it, and that is the approach we are taking now as we do the fiscal year 2010 budget build.

Of course, the fiscal year 2010 budget will never really go anywhere. I mean, this administration will not deliver a fiscal year 2010 budget, but at least all of the process will be there to look at both risk reduction and are there any good business case decisions to be made based upon what we now know, with all these independently audited costs and schedules.

Mr. SIMPSON. Let me just tell you, as we talked earlier about this, I agree with the department on what they are doing in risk assessment. We ought to clean up the sites that pose the greatest risk as quick as we can and really focus our resources there, and we all understand that that doesn't mean that you can't—that you just ignore the other sites, that we have to continue to work on those and that presents problems at sites like Oak Ridge and Idaho this year.

Particularly, we don't want to see the fluctuations in funding that create the workforce problems that you have talked about and are willing to look at and try to address, and I appreciate that, because that does create problems when we are trying to—when we are trying to do a job, we lay off workers and then, years later, we are trying to hire them back and you can't get them back, and that creates special problems.

So I appreciate the fact that you understand those challenges that this creates.

But, also, I have been out to Hanford and I have looked there and I understand that that is a huge problem and we can't allow that river to get contaminated.

If we do, I think the nuclear industry in the United States is over, because the American public won't accept it.

And so it is not just the future of the nuclear industry, it is the right thing to do, and it is the future of that river.

I was sitting here listening to your discussion with the chairman. I want to see this—everything you guys were discussing about—I want to see a picture, so I can understand it.

It is confusing to us and, obviously, it is challenging to us and frustrating to us and part of that is based on the history of DOE and things we have been told time and time again, and we naturally sit back and say, "Are we being told something else that 5 years from now, somebody else will tell us something different" in terms of cleanup.

Members of this committee, particularly, who have cleanup sites should know, 3 years ago, 7 years ago, it was accelerated cleanup. Now it is more risk-based and other types of things, and we keep seeing changes in policies.

We want to see some consistency and some things that get these sites cleaned up and I think we are willing to put the resources in to clean them up, as long as we have some consistency, and we are willing to do what is necessary at Hanford to clean it up.

Everyone on this committee understands the challenges there and the difficulty. That is a tough site.

Mr. RISPOLI. Yes, sir.

Mr. SIMPSON. And when you say we can't afford to leave that waste in those tanks until 2076, the problem is it won't stay in those tanks. It will be in the river, and we have got to get that site cleaned up.

So I appreciate, actually, your attention that you are focusing on Hanford and these other places, even though I hope you understand that our job is also oversight and to make sure things are done with the taxpayers' dollars that we can justify.

Mr. RISPOLI. Yes, sir.

FIXED PRICE REMEDIATION CONTRACTS

Mr. SIMPSON. One last question I have. This committee directed DOE to explore the use of guaranteed fixed price remediation contracts for some of your cleanup work.

Did you give us a report on that? Have you done any trials on that? What has been done to date?

Mr. RISPOLI. Yes, sir. I will get you the date of the report. The report was signed out to you all actually on September 29, 2006.

And we used a consultant who has done work for the DOD to help us with this report, because we learned, actually, from this committee staff that the DOD has been pretty successful.

They are called LRS Federal, LLC is the name of the company.

And we looked at a variety of places and, again, the ones—there were some that were ruled out right away. For example, Stanford's linear accelerator, there were just so many uncertainties. The university owns the property.

There are disagreements between us and the regulator and the state that we are working through and I think making good progress, but the consultant said that is just a nonstarter. There is way too much risk there.

And then they eventually came down and we focused in on, again, a couple of reactors at Brookhaven. The SEFOR reactor, we believe, would be a good candidate that was added by EPACT–2005.

And there are two gun sites, Savannah River site, that are not nuclear contaminated. They are basically hazardous waste contaminated, and we believe one of the two would be a viable candidate.

And what we said to you in our letter was that we would pick this up again once we finished the C.R. Well, now that we have a stable appropriation for 2008, we look at our budget for 2009 and we realize that, from a risk reduction perspective, SEFOR, Brookhaven reactors, where we have obviously cut the budget, are just not at the level that we can begin doing this.

We could begin doing something with any of those at this point. It is a matter of the fact that they fall at the lower end of the risk priority.

Mr. SIMPSON. Appreciate it. Thank you very much.

Mr. Chairman, one of the things that I would like to see, quite frankly, as we develop this budget is I think it would be a good idea, when we talk about penalties, that we are paying on, so I would like to see a line item in there somewhere that the DOE has for penalties, because I hate to see us appropriating money for a cleanup site and part of that money is going to pay penalties instead of cleanup.

And I would like it separated out somehow so we know pretty much what we are appropriating for penalties.

Mr. VISCLOSKY. And it would evidence part of the price you are paying because of——

Mr. SIMPSON. Right, exactly.

Mr. VISCLOSKY. Not all of them, but——

Mr. SIMPSON. Somehow, we ought to be able to do a better job of that so that we have some idea of it, because obviously the budget level does have some impact on the penalties you are going to pay.

Appreciate it. Thank you, Mr. Chairman.

Mr. VISCLOSKY. And I do appreciate a couple of things. One is the illustration that was provided to me earlier today. I was confused between PIT disassembly and MOX, and some people were very concerned about this afternoon's hearing, and appreciate that. I still got a bit confused myself, anyway.

But, also, Mr. Simpson, appreciate your attendance. Mike does take his responsibilities very seriously.

And I appreciate the fact that we didn't vote this afternoon and that he stayed in attendance. And while he and I are desperately trying to come back next year, both gentlemen here at the table may not be with us and I do want to take this opportunity, Mr. Rispoli and Mr. Owen, to thank you very much for your service and for your diligence and hard work.

Again, as I said in my opening statement, I know you are trying your best. It is just very frustrating when you refer back 10 years and it is just the same tune.

Mr. RISPOLI. Yes, sir.

Mr. STUPAK. So wish you well and would encourage you, in your last year, to just keep plugging away as hard as you can. And if we can be of any assistance, too, I would ask that you let us know.

Mr. RISPOLI. Well, if I may, I would like to, again, thank this committee and this committee's staff for the very, very strong interest in supporting our program, and we know that you really endeavor to understand it and we appreciate that.

We understand that and we appreciate it. And we thank you. It has been, for me, personally, very rewarding to work with all of you on this committee.

Mr. VISCLOSKY. Good. We are adjourned. Thank you very much.

Mr. OWEN. And I thank you for allowing me to rest my vocal cords.

[Questions and answers for the record follow:]

ENVIROMENTAL MANAGEMENT'S (EM) BUDGET DOES NOT MEET REGULATORY COMPLIANCE AGREEMENT

Chairman Visclosky. Mr. Rispoli, according to the Secretary's testimony on February 28, 2008, EM's FY 2009 budget request of $5.528 billion "would not meet some of the milestones and obligations contained in all of the environmental agreements that have been negotiated over many years with regulators."

How much more does EM need in FY 2009 to be legally compliant with all enforceable agreements?

Mr. Rispoli. There can be a number of reasons why compliance obligations are in jeopardy, including unanticipated or especially complex technical challenges. Until those challenges are solved, no amount of funding would guarantee that the Department can maintain compliance with all of its regulatory commitments. In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people. In determining these priorities, the Department works closely with federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with DOE.

Chairman Visclosky. Of the milestones and obligations the Environmental Management program will miss – Are any subject the DOE to fines and penalties as the result of being missed? If so, how many, and for how much?

Mr. Rispoli. Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated downward before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. Who pays for the missed milestones? Are contractors reimbursed?

Mr. Rispoli. Once imposed, who pays a fine or penalty depends on whose actions are responsible for missing the milestone. In the past, some fines for missed milestones have been paid by the Department, others by contractors. In some instances, the Department reimburses the contractor, in others not, again depending on whose actions caused the delay as well as the terms of the underlying contract.

Chairman Visclosky. Are missed milestones subject to the availability of appropriations? Have you requested any funds in FY 2009 to pay for fines and penalties?

Mr. Rispoli. No, liability for fines and penalties for missed milestones is not subject to the availability of appropriations. As a general policy, we do not make a separate request for funds to pay fines and penalties in our budgets. Any fines or penalties for which the Department is ultimately responsible would be paid out of appropriated funds.

Chairman Visclosky. Quantify for us how many of these missed milestones and obligations are due to lack of funding, and how many are due to other reasons, and what are those reasons?

Mr. Rispoli. The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the approximately 120 compliance milestones scheduled for completion in FY 2009, EM anticipates that 32 are at risk based on the program's expected performance through FY 2008.

Chairman Visclosky. The Waste Isolation Pilot Plant (WIPP) FY 2009 budget request is $211.4 million – a decrease of -$23 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? Since it is a disposal facility, are there other sites that will miss milestones due to the level of funding proposed for WIPP? At this funding level are there any fines and penalties associated with the missed milestones?

Mr. Rispoli. The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading.

However, WIPP does not have any enforceable milestones and we do not currently anticipate missing disposal milestones at any of our sites because of activities at WIPP. Therefore, there is no potential for fines or penalties at the proposed funding levels.

Chairman Visclosky. The Idaho National Laboratory (INL) FY 2009 budget request is $447.4 million, a decrease of -$76.1 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones?

Mr. Rispoli. The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 4 Idaho National Laboratory compliance milestones scheduled for completion in FY 2009, EM anticipates meeting all of them based on expected progress through FY 2008. Therefore, there should be no fines or penalties.

Chairman Visclosky. The total Oak Ridge FY 2009 budget request is $464.9 million, a decrease of -$40.4 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Federal Facilities Agreement and will you meet transuranic waste milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 12 Oak Ridge compliance milestones scheduled for completion in FY 2009, EM anticipates that 9 are at risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Richland FY 2009 budget request is $980.0 million, a decrease of -$48 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Tri-Party Agreement? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 31 Richland compliance milestones scheduled for completion in FY 2009, EM anticipates that 11 are at risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Office of River Protection FY 2009 budget request is $1 billion, an increase of +$9.8 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Tri-Party Agreement? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 9 Office of River Protection compliance milestones scheduled for completion in FY 2009, EM anticipates that 3 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Savannah River Site FY 2009 budget request is $1.39 billion, an increase of +$63 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 19 Savannah River compliance milestones scheduled for completion in FY 2009, EM anticipates that 5 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total request for cleanup activities at Los Alamos National Laboratory is $162.5 million, an increase of +$10.4 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 7 Los Alamos National Lab compliance milestones scheduled for completion in FY 2009, EM anticipates that 3 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $1,000 for the first thirty days of non-compliance and $3,000 per day thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total request for cleanup activities at Nevada is $65.5 million, a decrease of -$14.8 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 14 Nevada compliance milestones scheduled for completion in FY 2009, EM anticipates meeting all of them based on the program's expected performance through FY 2008. Therefore, there should be no fines or penalties.

Chairman Visclosky. The total West Valley site FY 2009 budget request is $59.0 million, an increase of +$3.5 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. However, West Valley does not have any compliance milestones scheduled for completion in FY 2009. Therefore, there are no milestones at risk of being missed and there should be no fines or penalties.

Chairman Visclosky. The total request for cleanup activities at Brookhaven National Laboratory is $8.4 million, a decrease of -$19.9 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. However, Brookhaven National Lab does not have any compliance milestones scheduled for completion in FY 2009. Therefore, there are no milestones at-risk of being missed at Brookhaven and there should be no fines or penalties.

Chairman Visclosky. The total request for cleanup activities for the Stanford Linear Accelerator Center is $4.8 million, a decrease of -$1.0 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli: The budget request of $5.5 billion could have been allocated in such a manner that milestones would potentially be at risk only due to reasons other than funding. However, the Environmental Management program has proposed an allocation approach recognizing that the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 4 Stanford Linear Accelerator Center compliance milestones scheduled for completion in FY 2009, EM anticipates that 1 is at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Moab site FY 2009 budget request is $30.5 million, an increase of +$6.8 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. The Environmental Management program is a complicated cleanup project impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other challenges. Consequently, isolating funding as the only issue placing the Department's cleanup milestones in jeopardy given the other compounding factors can be inaccurate and misleading.

The Moab site does not have any enforceable milestones; therefore, there is no potential for fines or penalties.

Chairman Visclosky. If you need to "renegotiate" these missed milestones and obligations—how will the Congress know you are doing so in a fiscally responsible manner? Meaning, it's convenient to kick the can down the road and tie up the next Administration and Congress to future commitments – how does Congress know the extent of these new financial liabilities before you sign up to them?

Mr. Rispoli. Negotiations with the Department's regulators generally provide for stakeholder and public input before agreements are finalized. Given the openness and duration of the process, Congress will have ample opportunity to conduct oversight.

EM PROJECT MANAGEMENT

The May 2007 GAO report on DOE project management says that despite considerable efforts to improve, such as training for federal managers, and having contractors implement earned value management systems, overall performance on DOE's projects has not substantially improved. The Department's performance goals for line-item construction projects were met only one third of the time.

Starting in February 2004, DOE began reporting performance information separately for EM cleanup activities funded from "operating" funds, rather than as individual line item construction projects. Prior to this time, these "operating" projects were included with the line item construction projects.

Since February 2004, these "operating" projects met cost and schedule performance goals only about 21 percent of the time.

Chairman Visclosky. Can you give us some examples of EM Operating Projects and their costs?

Mr. Rispoli. Cost estimates for Operating Projects are calculated for both a 50 percent and 80 percent confidence level.

The following table provides examples of EM Operating Projects and their costs:

| Site Name | Project Number | Project Name | Total Low Range ($M) | Total High Range ($M) |
|---|---|---|---|---|
| Richland | RL-0011 | Nuclear Materials Stabilization and Disposition-PFP | $2,179.0 | $2,203.0 |
| Richland | RL-0012 | Spent Nuclear Fuel Stabilization and Disposition | $956.6 | $983.5 |
| Richland | RL-0013C | Solid Waste Stabilization and Disposition-200 Area-2035 | $12,131.2 | $13,431.2 |
| Savannah River Site | SR-0014C | Radioactive Liquid Tank Waste Stabilization and Disposition-2035 | $16,251.0 | $24,742.0 |
| Idaho | ID-0040B | Nuclear Facility Decontamination and Decommissioning-2012 | $2,533.0 | $2,723.0 |
| Oak Ridge | OR-0041 | Nuclear Facility Decontamination and Decommissioning-Y-12 | $818.5 | $853.0 |

Chairman Visclosky. What level of confidence do you have in these cost estimates? 50 percent? 80 percent?

Mr. Rispoli. Confidence is a statistical analysis of the likelihood that a project will be completed within estimated cost and schedule. For example, a project at an 80 percent confidence level has an 80 percent chance of being completed within budget and schedule and a 20 percent chance of exceeding budget and schedule. Thus contingency to ensure this confidence is higher at 80 percent confidence than at 50 percent confidence.

EM assesses project confidence using an industry standard process of identifying project risks and then determining both their likelihood of occurrence and the potential impact should the risk occur. The EM baselines are estimated at the 80 percent confidence level. The baselines are calculated using a Monte Carlo statistical analysis based, in large part, on very specific risks associated with a project.

Chairman Visclosky. How can you effectively manage contractor performance when project baselines vary so often?

Mr. Rispoli. The Office of Environmental Management (EM) has instituted a rigorous project management process for all projects to ensure effective management of contractor performance. This includes certification of Federal Project Directors with line management authority and responsibility for direct oversight of the contractors as well as certification of the contractor's Earned Value Management Systems to ensure compliance with the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748 Standard for EVMS. The project baselines describe the plan for completing the work within a specified cost and schedule. It is reasonable to expect some variation in the project baselines as the work is executed in the field. EM maintains a "continuous review" of contractor performance including evaluation by the Federal Project Directors, monthly assessments by the Field Office Managers, and quarterly reviews by EM Headquarters including the Assistant Secretary. When deviations to the baseline are identified, a rigorous configuration control system is in place to review and take action on the proposed changes, following DOE requirements.

Chairman Visclosky. So, in 2004, you (or someone else?) decided that "operating" funded projects would not be "reported" along with construction projects – so what does this mean? We know that the Secretary and DOE senior management get reports on the construction projects – do they not see the performance on the operating projects as well?

Mr. Rispoli. The Department's senior management receives reports on the performance of all Environmental Management (EM) projects, including the operating or cleanup projects. DOE Order 413.3A on Project Management in affect in 2004 required that only capital line item (construction) projects include monthly project performance reporting. EM issued a "protocol" in June 2005, and updated in April of 2007, to require that the project management directives apply to all EM projects (including operating and cleanup) not just capital projects.

Project performance is evaluated by both EM and the Office of Engineering and Construction Management. The performance of all projects is reviewed monthly and the performance is evaluated based on current project risk, use of management reserve and contingency, and earned value management performance. Corrective actions for projects exhibiting poor performance and/or those showing a negative or downward trend in performance are further reviewed by EM's Chief Operating Officer on a monthly basis with the cognizant Field Office Managers and Federal Project Directors. In addition, the Assistant Secretary conducts a project review for each EM Project each quarter.

Chairman Visclosky. Are EM Operating Projects managed according to DOE Order 413.3A, like construction projects? Any other guidance?

Mr. Rispoli. All Environmental Management's (EM) Operating Projects are managed according to DOE Order 413.3A. Over the past four years, EM has issued guidance regarding: baseline configuration management and project change control; policies for operating project performance baselines and development of Federal risk management plans; direction for development of Federal lifecycle project baselines; and an Environmental Management contingency policy. DOE field offices are continually monitoring project performance through earned value management as well as assessing project risks, contingency, and safety. Senior management at EM Headquarters conducts quarterly reviews of all projects to further ensure effective management and oversight. EM is currently working with the Office of Engineering and Construction Management to more specifically tailor the requirements of DOE Order 413.3A to the unique nature of operating projects, especially with regard to effective management of project risk and project contingency requirements.

VALIDATION OF EM COST AND SCHEDULE BASELINES

Chairman Visclosky. Are EM Operating Projects tracked in the contractor's Earned Value Management systems (EVMS)?

Mr. Rispoli. Yes, all Environmental Management (EM) Cleanup Projects are tracked in the contractor's Earned Value Management System (EVMS) and reported to the Department. At this time, all EM sites that have EVMS surveillance plans in place are: Savannah River Site, Richland Operations, Oak Ridge Operations, Idaho Operations, and the Office of River Protection Tank Farms Project. The Secretary of Energy recently certified the contractor EVMS for the Office of River Protection Waste Treatment Plant Project. EM is continuing its efforts to certify all contractor EVMS systems for compliance with American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748 Standard for EVMS. EM and the National Nuclear Security Administration are also working together to develop a single EVMS surveillance plan for each site. Other sites will develop surveillance plans once the contractor EVMS is certified by the Office of Engineering and Construction Management.

EM PROJECT MANAGEMENT

The EM major operating projects have experienced significant cost increases and schedule delays over the past several years. Because EM underestimated the true cost of these projects and defers significant amounts of work scope, DOE potentially breaches commitments to Congress and regulators regarding the amount of work scope it will accomplish within a given schedule.

Chairman Visclosky. What strategy do you envision for future management of the Office of Environmental Management's portfolio of major operating projects for correcting past cost and schedule estimating problems?

Mr. Rispoli. The Office of Environmental Management (EM) will continue to emphasize strict adherence to DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, in the management of operating or cleanup projects to minimize cost and schedule estimating problems. This includes strict adherence to the Critical Decision process to ensure the project meets all applicable Departmental mission, design, security and safety requirements, more effective and realistic assessment and control of project risks, continued emphasis on accurate cost estimating and development of independent government cost estimates, and effective incorporation of lessons-learned into project planning activities. EM will also continue to emphasize effective Federal line management responsibility for the performance of all projects and renewed emphasis on contractor accountability. In addition, EM has recently completed certification of the project baselines to maintain a more realistic assessment of future project costs and schedules. The process of baseline certification, using external independent review teams, will continue. This will provide an added level of confidence in the accuracy of the cost and schedule estimates.

Chairman Visclosky. Given the Office of Environmental Management's past inability to prepare credible project cost and schedule estimates, how do you plan to minimize future risk of regulatory non-compliance that could result in fines and to reduce any inefficiency that might result from work scope deferral?

Mr. Rispoli. The Department has recently put in place independently reviewed and certified baselines. To the extent possible, in partnership with our regulators we plan to realign existing compliance requirements to be consistent with these baselines to avoid future instances of non-compliance. We would factor the baselines into any new compliance milestones before agreeing to them.

DOE's Office of Engineering and Construction Management is responsible for independently validating that EM cost and schedule baselines can be successfully accomplished. DOE's FY 2009 budget request explains that each site has undergone an independent review and that all near-term baselines are on track to be reviewed and approved in 2008.

Chairman Visclosky. Given that the Subcommittee continues to hear about cost increases and schedule delays within the EM program, what assurances can you provide to the subcommittee that these external independent reviews conducted by OECM are having the desired effect?

Mr. Rispoli. At this time, I believe that the Environmental Management program has prepared and approved a very realistic series of project baselines. My approval of these baselines is based in part on the recommendation from the Office of Engineering and Construction Management (OECM) that the identified scope can be accomplished within the stated cost and that the lifecycle cost and schedule is reasonable. Should future project conditions necessitate cost and schedule revisions, the baselines are acceptable as a point from which to control future change. In many instances, it was necessary to include additional contingency in order to address risks identified in the risk management plans within the projects to resolve issues identified by OECM. In this regard, I believe that the external independent reviews conducted by OECM and the project management rigor that EM has placed on this effort have had the desired effect resulting in realistic project baselines and life-cycle cost ranges.

Chairman Visclosky. Can you provide examples to the Subcommittee of findings by these reviews that resulted in any significant changes to the cost and schedule baselines of your operating projects?

Mr. Rispoli. The baseline for the Office of River Protection Tank Farm Project underwent an external independent review prior to validation. A finding from the external independent review recommended that the project contingency should be increased from 10 percent to 20 percent, given the current stage of the project and the fact that the project was using existing technologies to manage the tank farm cleanup. In response to the finding, Environmental Management (EM) increased the project contingency for fiscal years (FY) 2011 and 2012 by $11 million and further increased project contingency by an additional $48 million for period FY 2013 through 2042.

Chairman Visclosky. Any examples related to the "major" operating projects?

Mr. Rispoli. The Office of River Protection Tank Farm Project, mentioned above, is a "major" operating project.

Chairman Visclosky. Any examples of where an external independent review has been conducted and the baseline did not change?

Mr. Rispoli. At this time, EM does not have any examples of an external independent review that did not result in some type of baseline change.

EM PROJECTS: TECHNOLOGY READINESS

GAO recommended in 2007 that DOE adopt the use of technology readiness assessments to ensure that the critical technologies within its major projects are successfully demonstrated before proceeding with construction. DOE's FY09 budget request explains that DOE conducted eight technology readiness assessments in FY07 and developed policy and guidance for conducting readiness assessments based on lessons learned from the FY07 assessments.

Chairman Visclosky. Mr. Rispoli, can you share with the Subcommittee the lessons learned from these technology assessments and whether you have incorporated your new policy and guidance on technology assessments into DOE project management order?

Mr. Rispoli. The Department of Energy's Office of Environmental Management (DOE-EM) is implementing the Technical Readiness Assessment (TRA) process that was originally developed by the National Aeronautics and Space Administration, used by the Department of Defense, and recommended by the Government Accountability Office (GAO) since 1999. GAO recommended the use of TRAs in its recent (March 2007) assessment of the Department's projects. To date, eight TRAs have been completed covering several projects at both the Hanford and Savannah River sites.

Our year-long pilot of the TRA process has shown it to be structured, criteria-based, and clearly documented. It also identifies specific actions to reduce risk; is a useful tool for comparing candidate technologies; promotes decision-making discipline; and improves technical communication.

Environmental Management has issued a Technology Readiness Assessment/Technology Maturation Plan Guide dated March 31, 2008. This document provides guidance on how to conduct a TRA and how the TRA process interfaces with the project management process described in DOE Order 413.3 and other guidance. In the coming year, we plan on accumulating additional experience with TRAs, introducing the concept more broadly in the Department and determining whether changes to project management requirements are appropriate.

Chairman Visclosky. DOE has begun to address contamination that is entering the Columbia River at the Hanford site, but still little about the contamination in the vadose zone in other parts of the site. What is DOE's plan to better understand vadose zone contamination and treatment?

Mr. Rispoli. DOE has recently received approval from the regulators on a supplemental work plan to characterize vadose zone contamination in the Central Plateau at the Hanford Site. DOE is also working with the regulators, tribes and stakeholders to formalize a plan to deploy technologies to remediate contamination deep in the vadose zone. An initial draft has been provided to the regulators, and DOE will be working with the tribes and stakeholders this spring to finalize the plan and initiate planned activities starting this summer. The plan calls for laboratory tests on some technologies and field

verification tests on other technologies. This plan will require 5-7 years to implement due to the technical difficulty of evaluating the effectiveness of technologies applied to contamination occurring 200 feet below the surface.

GROUNDWATER CONTAMINATION AT THE HANFORD SITE

Chairman Visclosky. DOE has begun to address contamination that is entering the Columbia River at the Hanford site, but still little about the contamination in the vadose zone in other parts of the site.

What level does DOE plan to cleanup groundwater at the Hanford site?

Mr. Rispoli. The Department of Energy is striving to meet groundwater cleanup requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We also strive to meet the cleanup standards set by the State of Washington under its Resource Conservation and Recovery Act (RCRA) authority. Groundwater treatment systems are currently being upgraded and expanded to clean up groundwater to their beneficial uses (drinking water standards), within the time frame consistent with the overall Hanford cleanup schedule, to the extent practicable with current and emerging technologies.

GROUNDWATER CONTAMINATION: HANFORD VS. OAK RIDGE

Chairman Visclosky. After several years of Congress "earmarking" funds for groundwater remediation at Hanford, the FY 2009 budget request finally includes additional funds to address this important programmatic matter. However, at the East Tennessee Technology Park, where 2,200 acres of the 5,000 administrative acres contain contamination including known groundwater contaminant plumes from former burial grounds and contaminated soils --- funds for these activities were reduced in the FY 2009 budget request by nearly -$90 million. Mr. Rispoli, why is there increased funding for groundwater issues at Hanford, while groundwater remediation activities are cut at Oak Ridge?

Mr. Rispoli. The Department considers groundwater at all sites to be a high priority. The increased funding for groundwater issues at Hanford was primarily needed to construct a pump and treatment facility, increase in-situ remediation activities, and to increase characterization drilling and work plan implementation along the Columbia River. The majority of the funding at East Tennessee Technology Park is directed toward decontamination and decommissioning of above-ground structures. It is anticipated that it will be several years before a record of decision for remedy of groundwater contamination at East Tennessee Technology Park is issued. In the meantime, groundwater monitoring is ongoing to ensure that contamination at East Tennessee Technology Park is not migrating offsite.

WIPP AVAILABLE FOR HANFORD WASTE

Mr. Visclosky. I have been informed that DOE believes that about 20 of its 177 underground tanks at Hanford contain transuranic (TRANZ-URANIC) waste that can be dried, repackaged, and sent to the Waste Isolation Pilot Plant (WIPP) for permanent disposal at a cost savings compared to vitrifying this waste. However, this waste does not meet WIPP waste acceptance criteria. Even if WIPP accepts this waste, will there be capacity at WIPP for this waste?

Mr. Rispoli. The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act (Public Law 102-579, as amended) limits the WIPP repository disposal volume to 6.2 million cubic feet (approximately 175,000 cubic meters) of transuranic waste (TRU) generated by defense activities. The Department believes it will be able to accommodate TRU waste targeted to be disposed at WIPP within its available capacity.

Mr. Visclosky. Does DOE still consider this a viable disposal alternative or has this opportunity for cost savings passed?

Mr. Rispoli. The Department considers this a viable disposal alternative provided the waste meets the definition of TRU waste under the Waste Isolation Pilot Plant Land Withdrawal Act (P.L. 102-579, as amended), satisfies the WIPP Waste Acceptance Criteria, and receives regulatory approval under 40 CFR 191 and RCRA for disposal at WIPP.

Mr. Visclosky. If so, what is DOE's strategy for obtaining the assurance that WIPP's acceptance criteria can be revised to accept this waste?

Mr. Rispoli. There are no current plans to change WIPP's acceptance criteria. Waste can only be accepted at WIPP if it is determined to be defense-related transuranic waste, as specified in the Waste Isolation Pilot Plant Land Withdrawal Act (P.L. 102-579, as amended) and receives regulatory approval for disposal at WIPP.

Mr. Visclosky. What is DOE's strategy for addressing this waste if WIPP does not revise its acceptance criteria?

Mr. Rispoli. If the waste is determined not to be eligible for disposal at WIPP, the Department will further evaluate the nature and characteristics of the waste and will develop an appropriate disposition path, based on this analysis and available disposal options.

SAFETY INCIDENTS AT HANFORD

Chairman Visclosky. Hanford, like other DOE sites, has experienced safety incidents. For example, a 2004 investigation found that workers at Hanford had been exposed to radioactive vapors from underground waste storage tanks. In July 2007, more than 80 gallons of radioactive and hazardous waste spilled onto the ground as it was being pumped between underground tanks at the Hanford site. Up to 12 workers later reported health problems from their exposure to the spilled waste. In addition, work emptying the tanks ceased for more than 6 months. What steps, if any, has DOE taken to improve safety performance at the Hanford site?

Mr. Rispoli. The protection of our workers, the public, and the environment are paramount to the Department's cleanup mission at Hanford. When incidents do occur, the Department takes immediate action to protect human health and the environment, undertake in-depth analyses to understand the root causes, and develop corrective actions.

The Department is using a number of tools to keep workers safe and improve safety performance at sites such as Hanford. Integrated Safety Management is the basis of our safety program across the Department's sites. It involves the integration of safety awareness and practices into all aspects of work performance. Integrated Safety Management provides a formal process where workers plan, perform, assess, and improve the safe conduct of work, down to each and every task.

Recently, as part of our ongoing effort to continuously improve safety performance, and in response to our Environmental Management initiative to strengthen safety, Hanford senior management implemented a Human Performance Initiative (HPI) pilot that included DOE and its prime contractors. HPI is a tool that has been very successful in reducing the occurrence of events in the commercial power industry. Results of the pilot indicate that the effort and resources expended to implement HPI tools are worthwhile, improve operational performance, and improve Integrated Safety Management implementation.

The Hanford injury rates have substantially improvement over several years. For example, the Hanford Total Recordable Case (TRC) incidence rate for 2006 was 1.0 case per 200,000 work hours and for 2007 it was 0.8. The rate of injury cases that include lost time for 2006 was 0.5, while the rate in 2007 was 0.3. These Hanford injury rates are significantly below the comparable national construction and waste disposal industry injury rates. The comparative 2006 TRC rates for the construction and waste disposal industries were 5.9 and 6.5, respectively, while the lost time injury rates for these industries were 3.2 and 3.9. National industry injury rates are not yet available for 2007.

Oversight of the contractor's operations has been enhanced through the selective hiring of technical expertise in individual critical areas of nuclear operations called Safety System Oversight experts (SSOs), increased numbers of Facility Representatives that perform daily safety oversight in the field and an increase in radiological conduct of operations personnel that view how the contractor's performance meets verbatim compliance with their Radiological Protection Program. Combined, the process of Integrated Safety Management, changing human performance through the Human Performance Initiative and increased oversight expertise is leading to an improved safe work environment at the Hanford Site.

CLEANUP PROJECTS AT THE HANFORD SITE

Chairman Visclosky. DOE's Hanford site has 177 underground tanks that store nearly 57 million gallons of radioactive and hazardous waste byproducts from plutonium production. DOE has not met current milestones laid out in the Tri-Party Agreement and new milestones are currently being renegotiated. All told, the costs of DOE's current strategy to treat and permanently dispose of this waste could total $70 billion or more and the timeframes for completion may be 2050 or later.

Given DOE's failure to meet past cost and schedule commitments for dealing with this waste, what assurance does the Congress have that DOE will actually meet new cost and schedule commitments?

Mr. Rispoli. While the Department has successfully met many Tri-Party Agreement (TPA) milestones, there were others that could not be met. Reasons include seismic and other technical issues encountered during the design and construction of the Waste Treatment and Immobilization Plant (WTP), a first of its kind facility designed to treat all of the high-level radioactive waste in Hanford tanks, as well as challenges experienced when removing difficult waste forms from the single-shell tanks to the extent required by the TPA. The Department has addressed these issues with resolve, drawing upon some of the best seismic, process design, and waste management experts in the nation.

The Environmental Management program has made a concerted effort during the past several years to bring its project and contract management capabilities up to "best in class." As part of this effort, we have now put in place, independently reviewed, and validated cost and schedule baselines for the tank farms and WTP projects at Hanford, and have certified earned value management systems (EVMS) in place for these projects, in particular the WTP. We have put in place a Manager and Deputy Manager of the Office of River Protection with strong management credentials, particularly in the areas of safety and construction, and have hired additional project management, technical, procurement, and financial management staff. With these capabilities in place, we have enhanced project and technical oversight, and have instituted strong project control and management principles.

Chairman Visclosky. The radioactive waste contained in Hanford's underground tanks is naturally decaying over time. In less than 100 years, the concentrations of radioactivity for the vast majority of the two primary radioactive waste constituents and their decay products will have decrease by 90 percent. Given (a) the mounting costs and ever-lengthening timeframes for completing the treatment and disposal of Hanford's tank waste and (b) the natural reduction of radioactivity over time:

Are there other waste treatment options that would be more cost-effective?

Mr. Rispoli. In addition to the two major fission products (cesium and strontium) referenced in your question, Hanford's tank wastes also contain other long-lived radionuclides such as technetium-99, with a half-life of 211,000 years, and plutonium-239, with a half-life of 24,000 years. Consequently, although the primary fission products decay to low levels during the first few hundred years, certain waste constituents will remain hazardous for tens of thousands of years.

Because of the high cost and limited space available in the national repository, the Department's strategy calls for separating the large mass of low activity wastes (LAW) in Hanford's tank waste from the bulk of the radionuclides. This separation process will reduce the volume of high-level radioactive waste (HLW) disposed of at the repository by a factor of ten and result in more than ninety percent of the tank waste volume (but only a small percentage of the radioactivity) being disposed of on-site at Hanford as LAW. The Department is evaluating options for optimizing the treatment of the LAW fraction. Options being evaluated in that study include enhancing the WTP LAW Vitrification Facility to enhance the throughput of the vitrification process, developing an interim pretreatment system to enable WTP LAW vitrification to occur several years in advance of full WTP startup, and the potential use of non-WTP LAW immobilization technologies such as bulk vitrification, steam reforming, or a cement-based cast stone to increase LAW immobilization capability.

The Department believes that this strategy (separating the waste into high-level and low-activity waste fractions for disposal off-site and on-site, respectively) is sound and its analyses of options are limited to exploring opportunities within this strategic framework.

CONTRACTOR PERFORMANCE

Chairman Visclosky. The Office of Science recently released a "report card" on the performance of its ten laboratories. It is useful to have this information publicly available, and to be able to compare contractor performance with contractor fees earned. This enables everyone, both in Congress and the public, to understand how DOE contractors are performing and how that performance relates to their compensation. Why doesn't the Office of Environmental Management issue a similar "report card" on the performance of all of its major cleanup contractors?

Mr. Rispoli. EM will evaluate the Office of Science procedures and practices for contractor performance reporting and determine if it would be beneficial in developing an EM specific fee performance reporting system.

DOE DEFENSE WASTE

Chairman Visclosky. As currently authorized, what fraction of the EM high-level waste can go into the Yucca Mountain repository?

Mr. Rispoli. The Yucca Mountain Repository is authorized to accept 70,000 metric tons of heavy metal (MTHM) of spent nuclear fuel (SNF) and high-level waste (HLW). Ten percent, or 7,000 MTHM, of the authorized limit is allocated to defense-related HLW and SNF. Of this capacity, 4,667 MTHM is planned for the disposal of HLW in canisters and 2,333 MTHM for DOE SNF. Using the standard estimate, each canister of HLW is equivalent to 0.5 MTHM; therefore, 9,334 canisters of HLW (or 40 percent) of a total of 22,600 canisters projected to be produced, can be disposed of in the repository. It should be emphasized that these canister projections are based on current management plans and treatment technologies. Also, the Administration has submitted legislation to Congress which, among other items, would remove the 70,000 MTHM cap on Yucca Mountain. As HLW immobilization activities are implemented at Department sites, as few as 16,700 canisters and as many as 33,100 canisters could be produced.

ADDITIONAL CLEANUP RESPONSIBILITIES

Chairman Visclosky. The NNSA has a plan for consolidating the footprints t the Y-12 plant and disposing of excess facilities. Similarly, the Oak Ridge National Lab also has a plan to modernize its central campus, which will require the disposal of excess facilities. Some of these facilities are just old, but especially at Y-12 there may be facilities with significant radioactive contamination. In the absence of a five-year plan, we see no evidence that Environmental Management is prepared to receive a major influx of contaminated facilities from these other programs. Does your internal outyear planning assume the transfer of facilities from Y-12 and ORNL to EM?

Mr. Rispoli. Our current baselines do not assume transfer of additional facilities at Y-12 and ORNL. However, the Oak Ridge Operations Office is leading a diverse team with representatives of the Office of Science, the National Nuclear Security Administration (NNSA) and the Environmental Management (EM) program to develop an integrated approach for this extensive and challenging work to address not only excess facilities but contaminated soil, ground and surface waters.

Chairman Visclosky. What is the estimated cost to EM for the cleanup of these facilities?

Mr. Rispoli. Consistent with DOE Order 413.3A, the cost range will be established upon approval of Critical Decision 1 by the Secretarial Acquisition Executive.

Chairman Visclosky. What other sites, laboratories, or program offices are contemplating significant shifts of facilities to be handed off to EM for cleanup and disposal?

Mr. Rispoli. In addition to the facilities discussed on the Oak Ridge Reservation, more than 75 additional facilities have been nominated by NNSA, Science and the Office of Nuclear Energy (NE) at Argonne National Laboratory, Brookhaven National Laboratory, Stanford Linear Accelerator Center, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Idaho National Laboratory, and Savannah River Site.

Chairman Visclosky. What is the DOE guidance or process used to decide which facilities should be cleaned up by the parent program offices and which should be transferred to Environmental Management?

Mr. Rispoli. The Deputy Secretary recognized EM's expertise in the area of decommissioning and directed me in the FY 2008 budget decisions to renew planning for excess facilities from other program offices. To that end, the Department is using the process outlined in DOE Order 430.1B, *Real Property Asset Management*, and its associated guidance, which outlines the acceptance criteria for transferring facilities from one DOE program to another. In summary, EM has expertise in decommissioning contaminated facilities and is to plan for an orderly transfer of those facilities. The Assistant Secretary requested nominations of excess facilities for the first time in several years in December 2007. Inputs have been received from NNSA, Science and NE. We are in the process of evaluating those nominations for adherence to the acceptance criteria, and evaluating how much it will cost and when those facilities might be scheduled for transfer and decommissioning.

HANFORD

Chairman Visclosky. Is the cleanup of groundwater contamination now the top priority for the State and Federal regulators at the Hanford site?

Mr. Rispoli: Our understanding, based on discussions with the State of Washington and the U. S. Environmental Protection Agency is that the cleanup of groundwater contamination is one of their top priorities.

C hairman Visclosky. Please explain why your budget request is still $690 million for the Waste Treatment Plant, despite the performance problems for this project and the shift in regulator priorities?

Mr. Rispoli. With regard to regulators priorities, the Department's understanding with Washington State and the U.S. Environmental Protection Agency (EPA) is that they still consider construction of the Waste Treatment and Immobilization Plant (WTP) and tank waste cleanup as among the top priorities for the Hanford Site.

The $690 million in annual funding for the WTP is based on the independently reviewed, validated, and approved baseline for that project, and is necessary to ensure the plant will be constructed, tested, and ready to begin treatment of Hanford's tank waste in 2019. The WTP is the cornerstone of the Department's strategy to retrieve and immobilize the highly radioactive waste stored in Hanford's aging underground tanks.

The Department has successfully addressed or is currently addressing several technical and management issues, such as seismic design criteria, that previously impacted the WTP schedule. The Department is on course for starting the WTP in 2019. To stay on that schedule, the independently validated baseline requires $690 million in annual WTP funding.

Chairman Visclosky. This Committee has no interest in appropriating more than $2 billion per year to the Hanford site. If groundwater remediation is growing in importance, what other lower-priority work will be displaced?

Mr. Rispoli. In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people. In determining these priorities, the Department works closely with federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with DOE.

The 2009 Budget proposes $1.9 billion for the Hanford site including $690 million for the Waste Treatment Plant and $170 million (an increase of $65 million) for groundwater remediation. The proposed funding reflects the prioritization discussed above and we hope the Committee will support the requested funding.

H-CANYON ACTIVITIES AT SAVANNAH RIVER

Chairman Visclosky. I want you to be very clear about something with the Committee. The Department proposes to ship aluminum-clad spent fuel from Idaho to Savannah River in preparation for processing that fuel at H-Canyon in FY2009. Is that correct?

Mr. Rispoli. Yes, consistent with existing DOE public decisions pursuant to the National Environmental Policy Act, all aluminum-clad spent fuel is to be consolidated at the Savannah River Site, while non-aluminum-clad spent fuel is to be consolidated at Idaho. Shipments of spent fuel from the two sites could begin as early as late FY 2009.

Chairman Visclosky. Is it also correct that DOE will use chemical processes to separate out plutonium and other radioisotopes from this spent fuel?

Mr. Rispoli. Yes, the highly radioactive fission products and the very small amount of plutonium in the spent fuel will be chemically separated from the uranium and transferred to the radioactive liquid waste system for ultimate stabilization. The uranium in the spent fuel will be recovered, blended down to a low enrichment, and sold to an end user for use in manufacturing fuel for commercial nuclear reactors.

Chairman Visclosky. Given the political sensitivity regarding reprocessing of spent fuel, will you agree that these H-Canyon activities constitute reprocessing?

Mr. Rispoli. With respect to spent fuel, during the Cold War years the term "reprocessing" generally meant the separation of the fission products from the uranium, and then recovering the uranium for the purpose of using it to manufacture new fuel for reactors that were being used to irradiate target material to transmute it into plutonium that would subsequently be recovered and used in weapons.

The activities being conducted today in the H-Canyon facilities are for an entirely different purpose. Although processing the spent fuel in H-Canyon will separate the uranium from the fission products and plutonium, the uranium in the spent fuel will be recovered for use in civilian reactors to generate electricity, not as part of some weapons production activity. It is important to note that blending down the recovered uranium makes it no longer weapons-usable, and supports U.S. nonproliferation objectives. The fission products and plutonium resulting from processing the spent fuel will be discarded as high activity waste to the liquid waste tanks for eventual vitrification in the Defense Waste Processing Facility. This will have the benefit of significantly reducing the volume of waste generated, realizing the energy production value of the material, and supporting our nation's nonproliferation objectives.

Chairman Visclosky. Are there any other places in the DOE complex that are engaged in reprocessing at any greater than the laboratory "bench scale"?

Mr. Rispoli. No. H-Canyon is the last production-size chemical separation facility in the United States, and therefore is an invaluable asset in our nuclear material disposition and threat and risk reduction efforts.

IDAHO CLEANUP

Chairman Visclosky. Will DOE meet its regulatory milestones to have all of the tanks empty by 2012? If not, what are the consequences of missing that milestone?

Mr. Rispoli. The Department is evaluating the impact of a possible delay in construction of the Sodium Bearing Waste Facility. The tanks storing the waste to be treated at the Sodium Bearing Waste Facility are continually monitored and are in very good condition. Consequently, the Department is evaluating redirecting funding to greater risk-reduction projects, such as retrieval of buried waste at the Idaho National Laboratory (INL) Subsurface Disposal Area. This evaluation includes identification of savings opportunities, as well as schedule impacts to operations. A full 24-month delay would likely result in emptying the tanks six to twelve months after the 1995 Settlement Agreement milestone date of December 31, 2012.

If the Department fails to satisfy the requirements in the agreement, shipments of Environmental Management (EM) spent fuel to INL could be suspended until the tanks are emptied and the contents are treated. This potential suspension could affect EM and Office of Nuclear Energy fuel receipts, but not the Navy since its activities under the 1995 Settlement Agreement are unaffected by EM's failure to comply with the Settlement Agreement.

FUNDING AT NNSA SITES

Chairman Visclosky. DOE is requesting approximately one-quarter of a billion dollars for cleanup activities at NNSA sites. How does the risk at these sites compare to other non-NNSA sites?

Mr. Rispoli. The overall risks at NNSA sites are comparable to non-NNSA sites based on the types of waste and environmental contamination that are present. At Los Alamos National Laboratory, for instance, there are significant inventories of transuranic waste in close proximity to the public as well as soil and groundwater remediation issues near the Rio Grande and other offsite receptors.

LOS ALAMOS BASELINE

Chairman Visclosky. What is the status of the baseline for cleanup activities at Los Alamos — is it as reliable as those developed for other sites? Why is that the case for Los Alamos?

Mr. Rispoli. The Department developed the Los Alamos baseline using assumptions that may not be achievable, such as improved productivity from the new management and operations contractor at the site. EM recognizes the need to update the baseline and will make every effort to maximize risk reduction and compliance requirements as it continues to pursue cleanup goals at Los Alamos.

FIXED-PRICE REMEDIATION CONTRACTS

Chairman Visclosky. This Committee directed DOE to explore the use of guaranteed fixed-price remediation contracts for some of your cleanup work. Please explain the results of any trials you have conducted to date.

Mr. Rispoli. Throughout the mid-to latter-part of fiscal year (FY) 2007, the Department's Office of Environmental Management introduced and investigated the feasibility of implementing guaranteed fixed-price remediation (GFPR) contracting in the Department of Energy (DOE) complex. GFPR contracts work best for sites that have adequate site characterization data, well-defined regulatory closure requirements and no final decision on remedy selection. Based on these criteria, four potential GFPR Pilot Projects were identified and extensive assessments of the work scope at these sites were conducted to determine their suitability for the GFPR platform. As a result of a more detailed viability assessment, the four projects proved unsuitable for the GFPR contracting methodology for a variety of reasons. The following summarizes the details regarding EM's GFPR Candidate Projects and their viability assessments:

At the Stanford Linear Accelerator Center (SLAC) the cleanup standards for remediation of contaminated soils and groundwater are currently too uncertain.

- At the Brookhaven National Laboratory (BNL) there were no regulatory drivers for the demolition of a reactor fan house and the remediation of proximate soils; therefore, there were no opportunities for process efficiencies for cost and schedule savings.
- At the Separations Process Research Unit (SPRU) at the Knolls Atomic Power Laboratory there were no unique alternatives for the soils and groundwater remediation, other than soil removal, and there was a risk that soil removal volumes could not be adequately estimated.
- At the Savannah River Site - Gun-Site 012 and Gun-Site 218 remediation project, characterization results showed only background and incidental contamination at these sites.

In the course of the last year, the environmental insurance companies that underwrite GFPR contracts have also changed their procedures dramatically. When the Department began its GFPR consideration, the environmental insurance carriers were underwriting remediation projects for up to 100% of the firm fixed price (FFP) of the contracts. Over time, the policies of the insurance companies have changed as a result of losses the companies were experiencing from natural disasters and other GFPR contracts due to contractor claims. As a result, the insurance industry has increasingly become discriminatory in its underwriting practices to the point where GFPR policies are only offered to a specific dollar value and are increasingly restrictive, limiting possible applications to our projects.

Nonetheless, EM is continuing efforts to identify new GFPR candidates and resume the viability assessments. The renewed search will commence under the knowledge and scrutiny of the assessments that have preceded it and in light of the changing dynamics of the environmental insurance industry.

EM CONTRACTING STRATEGIES

Chairman Visclosky. The DOE cleanup budget has been getting squeezed the past six years. The Administration has been leaving it up to the Congress to add funding to continue progress on legally driven clean up responsibilities at DOE sites across the complex. On the ground the outcome of the budget cuts is an even greater proportional reduction in actual cleanup. The DOE sites have to pay for the basic operating expenses in order to keep the lights on and execute the basic safety programs so those activities continue to get funded. What gets delayed, pushed out and not done is actual cleanup progress?

Mr. Rispoli. The safety of our workforce and the communities surrounding our sites takes first precedence in funding decisions. After that, we direct funding to reduce the greatest risks as we continue to make progress in cleanup at DOE sites. We also continue to challenge our contractors, who are our cleanup partners, to be creative and think out of the box in their approach to cleanup issues to identify more innovative, cost-effective solutions.

EM CONTRACTING STRATEGIES

Chairman Visclosky. Mr. Rispoli, what programmatic or contracting strategies are you pursuing that ensure you have the most efficient, cost-effective operations at the sites in order to realize cost savings that can then be used for actual clean up activities?

Mr. Rispoli. The Office of Environmental Management (EM) is pursuing efficiencies on several fronts, including contract approaches, implementation of innovative technologies, and technical strategies. The Department's cleanup contracts are performance-based, where fee is earned based on measureable results. We incentivize the contractor by means of "stretch" performance incentives, where the contractor will get increased fee by producing above and beyond target amounts. For example, at a given cleanup site, if the contractor prepares more than the target number of drums for disposal of transuranic waste each year, additional fee can be earned for going beyond the target amount. Some incentives built into contracts have the Government sharing cost savings with the contractor. We are also incentivizing schedule reductions. If those milestones are achieved earlier than agreed, the contractor may earn additional fee for early finish dates. Whatever the funding level each year, we look to our contractors as partners in being creative and innovative to maximize their performance.

EM recently issued its Engineering and Technology Roadmap, which details strategic initiatives aimed at reducing project technical risk and uncertainty. The Roadmap seeks to build on EM's previous successes in technological innovation, which have contributed greatly to the enhanced safety, effectiveness, and efficiency of our projects. The Roadmap will guide the development of an increasingly strong and responsive applied research and engineering program. Specifically, the Roadmap consists of thirteen strategic initiatives that address anticipated technical risks and uncertainties in the following six areas: waste processing; groundwater and soil remediation; deactivation and decommissioning and facility engineering; spent nuclear fuel; challenging materials; and integration and cross-cutting initiatives. These initiatives will help ensure continued success in completing the cleanup of contaminated nuclear weapons manufacturing and testing sites across the United States.

EM is evaluating strategies for reducing the EM footprint across the complex to lower fixed landlord costs and maximize return on investment by reallocating those costs to actual cleanup activities. The approach balances EM's priorities of regulatory compliance, best business practices, and shared stakeholder vision. Some strategies being considered include bringing forward in the baseline schedules decontamination and decommissioning and small site completions, and developing and implementing alternative approaches to processing surplus nuclear materials, spent fuel, and tank waste. EM has been developing analytical building blocks (ABBs) linked to each site's certified baseline at the sub-PBS level. This lower level breakdown of EM's work scope allows us to build scenarios and conduct alternative analyses for the purpose of demonstrating ways to lower EM's risk sooner and achieve cost savings.

Enviromental Management's (EM) Budget Does Not Meet Regulatory Compliance Agreement

Chairman Visclosky. Mr. Rispoli, according to the Secretary's testimony on February 28, 2008, EM's FY 2009 budget request of $5.528 billion "would not meet some of the milestones and obligations contained in all of the environmental agreements that have been negotiated over many years with regulators."

How much more does EM need in FY 2009 to be legally compliant with all enforceable agreements?

Mr. Rispoli. There can be a number of reasons why compliance obligations are in jeopardy, including unanticipated or especially complex technical challenges. Until those challenges are solved, no amount of funding would guarantee that the Department can maintain compliance with all of its regulatory commitments. In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people. In determining these priorities, the Department works closely with federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with DOE.

Chairman Visclosky. Of the milestones and obligations the Environmental Management program will miss – Are any subject the DOE to fines and penalties as the result of being missed? If so, how many, and for how much?

Mr. Rispoli. Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated downward before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. Who pays for the missed milestones? Are contractors reimbursed?

Mr. Rispoli. Once imposed, who pays a fine or penalty depends on whose actions are responsible for missing the milestone. In the past, some fines for missed milestones have been paid by the Department, others by contractors. In some instances, the Department reimburses the contractor, in others not, again depending on whose actions caused the delay as well as the terms of the underlying contract.

Chairman Visclosky. Are missed milestones subject to the availability of appropriations? Have you requested any funds in FY 2009 to pay for fines and penalties?

Mr. Rispoli. No, liability for fines and penalties for missed milestones is not subject to the availability of appropriations. As a general policy, we do not make a separate request for funds to pay fines and penalties in our budgets. Any fines or penalties for which the Department is ultimately responsible would be paid out of appropriated funds.

Chairman Visclosky. Quantify for us how many of these missed milestones and obligations are due to lack of funding, and how many are due to other reasons, and what are those reasons?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the approximately 120 compliance milestones scheduled for completion in FY 2009, EM anticipates that 32 are at risk based on the program's expected performance through FY 2008.

Chairman Visclosky. The Waste Isolation Pilot Plant (WIPP) FY 2009 budget request is $211.4 million – a decrease of -$23 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? Since it is a disposal facility, are there other sites that will miss milestones due to the level of funding proposed for WIPP? At this funding level are there any fines and penalties associated with the missed milestones?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. However, WIPP does not have any enforceable milestones and we do not currently anticipate missing disposal milestones at any of our sites because of activities at WIPP. Therefore, there is no potential for fines or penalties at the proposed funding levels.

Chairman Visclosky. The Idaho National Laboratory (INL) FY 2009 budget request is $447.4 million, a decrease of -$76.1 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level you are deferring the decontamination and decommissioning of buildings and slowing buried waste retrievals – are there any missed milestones as a result? At this funding level are there any fines and penalties associated with the missed milestones?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 4 Idaho National Laboratory compliance milestones scheduled for completion in FY 2009, EM anticipates meeting all of them based on expected progress through FY 2008. Therefore, there should be no fines or penalties.

Chairman Visclosky. The total Oak Ridge FY 2009 budget request is $464.9 million, a decrease of -$40.4 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Federal Facilities Agreement and will you meet transuranic waste milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 12 Oak Ridge compliance milestones scheduled for completion in FY 2009, EM anticipates that 9 are at risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Richland FY 2009 budget request is $980.0 million, a decrease of -$48 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Tri-Party Agreement? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 31 Richland compliance milestones scheduled for completion in FY 2009, EM anticipates that 11 are at risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Office of River Protection FY 2009 budget request is $1 billion, an increase of +$9.8 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are you in compliance with the Tri-Party Agreement? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 9 Office of River Protection compliance milestones scheduled for completion in FY 2009, EM anticipates that 3 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Savannah River Site FY 2009 budget request is $1.39 billion, an increase of +$63 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 19 Savannah River compliance milestones scheduled for completion in FY 2009, EM anticipates that 5 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total request for cleanup activities at Los Alamos National Laboratory is $162.5 million, an increase of +$10.4 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 7 Los Alamos National Lab compliance milestones scheduled for completion in FY 2009, EM anticipates that 3 are at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $1,000 for the first thirty days of non-compliance and $3,000 per day thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total request for cleanup activities at Nevada is $65.5 million, a decrease of -$14.8 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 14 Nevada compliance milestones scheduled for completion in FY 2009, EM anticipates meeting all of them based on the program's expected performance through FY 2008. Therefore, there should be no fines or penalties.

Chairman Visclosky. The total West Valley site FY 2009 budget request is $59.0 million, an increase of +$3.5 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. However, West Valley does not have any compliance milestones scheduled for completion in FY 2009. Therefore, there are no milestones at risk of being missed and there should be no fines or penalties.

Chairman Visclosky. The total request for cleanup activities at Brookhaven National Laboratory is $8.4 million, a decrease of -$19.9 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. However, Brookhaven National Lab does not have any compliance milestones scheduled for completion in FY 2009. Therefore, there are no milestones at-risk of being missed at Brookhaven and there should be no fines or penalties.

Chairman Visclosky. The total request for cleanup activities for the Stanford Linear Accelerator Center is $4.8 million, a decrease of -$1.0 million below the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones? At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading. Of the 4 Stanford Linear Accelerator Center compliance milestones scheduled for completion in FY 2009, EM anticipates that 1 is at-risk based on the program's expected performance through FY 2008.

Many of our regulatory agreements contain a provision that addresses non-compliance with enforceable milestones under which the parties may agree to renegotiate the due date for at-risk milestones. Where fines and penalties are issued, the governing statute or regulatory agreement usually establishes the maximum fine or penalty that can be imposed – for instance, $5,000 for the first week of non-compliance and $10,000 for each week thereafter. However, our regulators retain the discretion to impose no fines or lesser fines than the maximum allowable, so it is impossible to predict what actual fines will be until they are imposed, and even then they may be negotiated before they are paid. When we have faced fines and penalties in the past, we have sometimes been able to negotiate an agreement by which the Department performs a supplemental environmental project in lieu of paying a fine to the regulators, thus ensuring that the money contributes to the Department's mission of protecting and enhancing the environment.

Chairman Visclosky. The total Moab site FY 2009 budget request is $30.5 million, an increase of +$6.8 million over the FY 2008 enacted level. At this funding level, will you be missing any compliance milestones?

Chairman Visclosky. At this funding level are there any fines and penalties associated with the missed milestones? How many violations and at what cost?

Mr. Rispoli. It is important to recognize that some milestones and obligations would have been missed regardless of the budgetary approach and the level of funding that was chosen. This is primarily the result of the relevant agreements having been negotiated years ago with incomplete knowledge by any of the parties of the technical complexity and magnitude of costs that would be involved in attempting to meet the requirements. Moreover, the cleanup program continues to be impacted by various safety, contract administration, project management, regulatory, legal, technical, economic, and other significant challenges. Consequently, isolating funding as the only issue placing some of the Department's cleanup milestones in jeopardy given the other confounding factors would be inaccurate and misleading.

The Moab site does not have any enforceable milestones; therefore, there is no potential for fines or penalties.

Chairman Visclosky. If you need to "renegotiate" these missed milestones and obligations—how will the Congress know you are doing so in a fiscally responsible manner? Meaning, it's convenient to kick the can down the road and tie up the next Administration and Congress to future commitments – how does Congress know the extent of these new financial liabilities before you sign up to them?

Mr. Rispoli. Negotiations with the Department's regulators generally provide for stakeholder and public input before agreements are finalized. Given the openness and duration of the process, Congress will have ample opportunity to conduct oversight.

EM PROJECT MANAGEMENT

The May 2007 GAO report on DOE project management says that despite considerable efforts to improve, such as training for federal managers, and having contractors implement earned value management systems, overall performance on DOE's projects has not substantially improved. The Department's performance goals for line-item construction projects were met only one third of the time.

Starting in February 2004, DOE began reporting performance information separately for EM cleanup activities funded from "operating" funds, rather than as individual line item construction projects. Prior to this time, these "operating" projects were included with the line item construction projects.

Since February 2004, these "operating" projects met cost and schedule performance goals only about 21 percent of the time.

Chairman Visclosky. Can you give us some examples of EM Operating Projects and their costs?

Mr. Rispoli. Cost estimates for Operating Projects are calculated for both a 50 percent and 80 percent confidence level.

The following table provides examples of EM Operating Projects and their costs:

| Site Name | Project Number | Project Name | Total Low Range ($M) | Total High Range ($M) |
|---|---|---|---|---|
| Richland | RL-0011 | Nuclear Materials Stabilization and Disposition-PFP | $2,179.0 | $2,203.0 |
| Richland | RL-0012 | Spent Nuclear Fuel Stabilization and Disposition | $956.6 | $983.5 |
| Richland | RL-0013C | Solid Waste Stabilization and Disposition-200 Area-2035 | $12,131.2 | $13,431.2 |
| Savannah River Site | SR-0014C | Radioactive Liquid Tank Waste Stabilization and Disposition-2035 | $16,251.0 | $24,742.0 |
| Idaho | ID-0040B | Nuclear Facility Decontamination and Decommissioning-2012 | $2,533.0 | $2,723.0 |
| Oak Ridge | OR-0041 | Nuclear Facility Decontamination and Decommissioning-Y-12 | $818.5 | $853.0 |

Chairman Visclosky. What level of confidence do you have in these cost estimates? 50 percent? 80 percent?

Mr. Rispoli. Confidence is a statistical analysis of the likelihood that a project will be completed within estimated cost and schedule. For example, a project at an 80 percent confidence level has an 80 percent chance of being completed within budget and schedule and a 20 percent chance of exceeding budget and schedule. Thus contingency to ensure this confidence is higher at 80 percent confidence than at 50 percent confidence.

EM assesses project confidence using an industry standard process of identifying project risks and then determining both their likelihood of occurrence and the potential impact should the risk occur. The EM baselines are estimated at the 80 percent confidence level. The baselines are calculated using a Monte Carlo statistical analysis based, in large part, on very specific risks associated with a project.

Chairman Visclosky. How can you effectively manage contractor performance when project baselines vary so often?

Mr. Rispoli. The Office of Environmental Management (EM) has instituted a rigorous project management process for all projects to ensure effective management of contractor performance. This includes certification of Federal Project Directors with line management authority and responsibility for direct oversight of the contractors as well as certification of the contractor's Earned Value Management Systems to ensure compliance with the American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748 Standard for EVMS. The project baselines describe the plan for completing the work within a specified cost and schedule. It is reasonable to expect some variation in the project baselines as the work is executed in the field. EM maintains a "continuous review" of contractor performance including evaluation by the Federal Project Directors, monthly assessments by the Field Office Managers, and quarterly reviews by EM Headquarters including the Assistant Secretary. When deviations to the baseline are identified, a rigorous configuration control system is in place to review and take action on the proposed changes, following DOE requirements.

Chairman Visclosky. So, in 2004, you (or someone else?) decided that "operating" funded projects would not be "reported" along with construction projects – so what does this mean? We know that the Secretary and DOE senior management get reports on the construction projects – do they not see the performance on the operating projects as well?

Mr. Rispoli. The Department's senior management receives reports on the performance of all Environmental Management (EM) projects, including the operating or cleanup projects. DOE Order 413.3A on Project Management in affect in 2004 required that only capital line item (construction) projects include monthly project performance reporting. EM issued a "protocol" in June 2005, and updated in April of 2007, to require that the project management directives apply to all EM projects (including operating and cleanup) not just capital projects.

Project performance is evaluated by both EM and the Office of Engineering and Construction Management. The performance of all projects is reviewed monthly and the performance is evaluated based on current project risk, use of management reserve and contingency, and earned value management performance. Corrective actions for projects exhibiting poor performance and/or those showing a negative or downward trend in performance are further reviewed by EM's Chief Operating Officer on a monthly basis with the cognizant Field Office Managers and Federal Project Directors. In addition, the Assistant Secretary conducts a project review for each EM Project each quarter.

Chairman Visclosky. Are EM Operating Projects managed according to DOE Order 413.3A, like construction projects? Any other guidance?

Mr. Rispoli. All Environmental Management's (EM) Operating Projects are managed according to DOE Order 413.3A. Over the past four years, EM has issued guidance regarding: baseline configuration management and project change control; policies for operating project performance baselines and development of Federal risk management plans; direction for development of Federal lifecycle project baselines; and an Environmental Management contingency policy. DOE field offices are continually monitoring project performance through earned value management as well as assessing project risks, contingency, and safety. Senior management at EM Headquarters conducts quarterly reviews of all projects to further ensure effective management and oversight. EM is currently working with the Office of Engineering and Construction Management to more specifically tailor the requirements of DOE Order 413.3A to the unique nature of operating projects, especially with regard to effective management of project risk and project contingency requirements.

VALIDATION OF EM COST AND SCHEDULE BASELINES

Chairman Visclosky. Are EM Operating Projects tracked in the contractor's Earned Value Management systems (EVMS)?

Mr. Rispoli. Yes, all Environmental Management (EM) Cleanup Projects are tracked in the contractor's Earned Value Management System (EVMS) and reported to the Department. At this time, all EM sites that have EVMS surveillance plans in place are: Savannah River Site, Richland Operations, Oak Ridge Operations, Idaho Operations, and the Office of River Protection Tank Farms Project. The Secretary of Energy recently certified the contractor EVMS for the Office of River Protection Waste Treatment Plant Project. EM is continuing its efforts to certify all contractor EVMS systems for compliance with American National Standards Institute/Electronic Industries Alliance (ANSI/EIA)-748 Standard for EVMS. EM and the National Nuclear Security Administration are also working together to develop a single EVMS surveillance plan for each site. Other sites will develop surveillance plans once the contractor EVMS is certified by the Office of Engineering and Construction Management.

EM Project Management

The EM major operating projects have experienced significant cost increases and schedule delays over the past several years. Because EM underestimated the true cost of these projects and defers significant amounts of work scope, DOE potentially breaches commitments to Congress and regulators regarding the amount of work scope it will accomplish within a given schedule.

Chairman Visclosky. What strategy do you envision for future management of the Office of Environmental Management's portfolio of major operating projects for correcting past cost and schedule estimating problems?

Mr. Rispoli. The Office of Environmental Management (EM) will continue to emphasize strict adherence to DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, in the management of operating or cleanup projects to minimize cost and schedule estimating problems. This includes strict adherence to the Critical Decision process to ensure the project meets all applicable Departmental mission, design, security and safety requirements, more effective and realistic assessment and control of project risks, continued emphasis on accurate cost estimating and development of independent government cost estimates, and effective incorporation of lessons-learned into project planning activities. EM will also continue to emphasize effective Federal line management responsibility for the performance of all projects and renewed emphasis on contractor accountability. In addition, EM has recently completed certification of the project baselines to maintain a more realistic assessment of future project costs and schedules. The process of baseline certification, using external independent review teams, will continue. This will provide an added level of confidence in the accuracy of the cost and schedule estimates.

Chairman Visclosky. Given the Office of Environmental Management's past inability to prepare credible project cost and schedule estimates, how do you plan to minimize future risk of regulatory non-compliance that could result in fines and to reduce any inefficiency that might result from work scope deferral?

Mr. Rispoli. The Department has recently put in place independently reviewed and certified baselines. To the extent possible, in partnership with our regulators we plan to realign existing compliance requirements to be consistent with these baselines to avoid future instances of non-compliance. We would factor the baselines into any new compliance milestones before agreeing to them.

DOE's Office of Engineering and Construction Management is responsible for independently validating that EM cost and schedule baselines can be successfully accomplished. DOE's FY 2009 budget request explains that each site has undergone an independent review and that all near-term baselines are on track to be reviewed and approved in 2008.

Chairman Visclosky. Given that the Subcommittee continues to hear about cost increases and schedule delays within the EM program, what assurances can you provide to the subcommittee that these external independent reviews conducted by OECM are having the desired effect?

Mr. Rispoli. At this time, I believe that the Environmental Management program has prepared and approved a very realistic series of project baselines. My approval of these baselines is based in part on the recommendation from the Office of Engineering and Construction Management (OECM) that the identified scope can be accomplished within the stated cost and that the lifecycle cost and schedule is reasonable. Should future project conditions necessitate cost and schedule revisions, the baselines are acceptable as a point from which to control future change. In many instances, it was necessary to include additional contingency in order to address risks identified in the risk management plans within the projects to resolve issues identified by OECM. In this regard, I believe that the external independent reviews conducted by OECM and the project management rigor that EM has placed on this effort have had the desired effect resulting in realistic project baselines and life-cycle cost ranges.

Chairman Visclosky. Can you provide examples to the Subcommittee of findings by these reviews that resulted in any significant changes to the cost and schedule baselines of your operating projects?

Mr. Rispoli. The baseline for the Office of River Protection Tank Farm Project underwent an external independent review prior to validation. A finding from the external independent review recommended that the project contingency should be increased from 10 percent to 20 percent, given the current stage of the project and the fact that the project was using existing technologies to manage the tank farm cleanup. In response to the finding, Environmental Management (EM) increased the project contingency for fiscal years (FY) 2011 and 2012 by $11 million and further increased project contingency by an additional $48 million for period FY 2013 through 2042.

Chairman Visclosky. Any examples related to the "major" operating projects?

Mr. Rispoli. The Office of River Protection Tank Farm Project, mentioned above, is a "major" operating project.

Chairman Visclosky. Any examples of where an external independent review has been conducted and the baseline did not change?

Mr. Rispoli. At this time, EM does not have any examples of an external independent review that did not result in some type of baseline change.

EM PROJECTS: TECHNOLOGY READINESS

GAO recommended in 2007 that DOE adopt the use of technology readiness assessments to ensure that the critical technologies within its major projects are successfully demonstrated before proceeding with construction. DOE's FY09 budget request explains that DOE conducted eight technology readiness assessments in FY07 and developed policy and guidance for conducting readiness assessments based on lessons learned from the FY07 assessments.

Chairman Visclosky. Mr. Rispoli, can you share with the Subcommittee the lessons learned from these technology assessments and whether you have incorporated your new policy and guidance on technology assessments into DOE project management order?

Mr. Rispoli. The Department of Energy's Office of Environmental Management (DOE-EM) is implementing the Technical Readiness Assessment (TRA) process that was originally developed by the National Aeronautics and Space Administration, used by the Department of Defense, and recommended by the Government Accountability Office (GAO) since 1999. GAO recommended the use of TRAs in its recent (March 2007) assessment of the Department's projects. To date, eight TRAs have been completed covering several projects at both the Hanford and Savannah River sites.

Our year-long pilot of the TRA process has shown it to be structured, criteria-based, and clearly documented. It also identifies specific actions to reduce risk; is a useful tool for comparing candidate technologies; promotes decision-making discipline; and improves technical communication.

Environmental Management has issued a Technology Readiness Assessment/Technology Maturation Plan Guide dated March 31, 2008. This document provides guidance on how to conduct a TRA and how the TRA process interfaces with the project management process described in DOE Order 413.3 and other guidance. In the coming year, we plan on accumulating additional experience with TRAs, introducing the concept more broadly in the Department and determining whether changes to project management requirements are appropriate.

Chairman Visclosky. DOE has begun to address contamination that is entering the Columbia River at the Hanford site, but still little about the contamination in the vadose zone in other parts of the site. What is DOE's plan to better understand vadose zone contamination and treatment?

Mr. Rispoli. DOE has recently received approval from the regulators on a supplemental work plan to characterize vadose zone contamination in the Central Plateau at the Hanford Site. DOE is also working with the regulators, tribes and stakeholders to formalize a plan to deploy technologies to remediate contamination deep in the vadose zone. An initial draft has been provided to the regulators, and DOE will be working with the tribes and stakeholders this spring to finalize the plan and initiate planned activities starting this summer. The plan calls for laboratory tests on some technologies and field verification tests on other technologies. This plan will require 5-7 years to implement due to the technical difficulty of evaluating the effectiveness of technologies applied to contamination occurring 200 feet below the surface.

GROUNDWATER CONTAMINATION AT THE HANFORD SITE

Chairman Visclosky. DOE has begun to address contamination that is entering the Columbia River at the Hanford site, but still little about the contamination in the vadose zone in other parts of the site.

What level does DOE plan to cleanup groundwater at the Hanford site?

Mr. Rispoli. The Department of Energy is striving to meet groundwater cleanup requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). We also strive to meet the cleanup standards set by the State of Washington under its Resource Conservation and Recovery Act (RCRA) authority. Groundwater treatment systems are currently being upgraded and expanded to clean up groundwater to their beneficial uses (drinking water standards), within the time frame consistent with the overall Hanford cleanup schedule, to the extent practicable with current and emerging technologies.

GROUNDWATER CONTAMINATION: HANFORD VS. OAK RIDGE

Chairman Visclosky. After several years of Congress "earmarking" funds for groundwater remediation at Hanford, the FY 2009 budget request finally includes additional funds to address this important programmatic matter. However, at the East Tennessee Technology Park, where 2,200 acres of the 5,000 administrative acres contain contamination including known groundwater contaminant plumes from former burial grounds and contaminated soils --- funds for these activities were reduced in the FY 2009 budget request by nearly -$90 million. Mr. Rispoli, why is there increased funding for groundwater issues at Hanford, while groundwater remediation activities are cut at Oak Ridge?

Mr. Rispoli. The Department considers groundwater at all sites to be a high priority. The increased funding for groundwater issues at Hanford was primarily needed to construct a pump and treatment facility, increase in-situ remediation activities, and to increase characterization drilling and work plan implementation along the Columbia River. The majority of the funding at East Tennessee Technology Park is directed toward decontamination and decommissioning of above-ground structures. It is anticipated that it will be several years before a record of decision for remedy of groundwater contamination at East Tennessee Technology Park is issued. In the meantime, groundwater monitoring is ongoing to ensure that contamination at East Tennessee Technology Park is not migrating offsite.

WIPP AVAILABLE FOR HANFORD WASTE

Mr. Visclosky. I have been informed that DOE believes that about 20 of its 177 underground tanks at Hanford contain transuranic (TRANZ-URANIC) waste that can be dried, repackaged, and sent to the Waste Isolation Pilot Plant (WIPP) for permanent disposal at a cost savings compared to vitrifying this waste. However, this waste does not meet WIPP waste acceptance criteria. Even if WIPP accepts this waste, will there be capacity at WIPP for this waste?

Mr. Rispoli. The Waste Isolation Pilot Plant (WIPP) Land Withdrawal Act (Public Law 102-579, as amended) limits the WIPP repository disposal volume to 6.2 million cubic feet (approximately 175,000 cubic meters) of transuranic waste (TRU) generated by defense activities. The Department believes it will be able to accommodate TRU waste targeted to be disposed at WIPP within its available capacity.

Mr. Visclosky. Does DOE still consider this a viable disposal alternative or has this opportunity for cost savings passed?

Mr. Rispoli. The Department considers this a viable disposal alternative provided the waste meets the definition of TRU waste under the Waste Isolation Pilot Plant Land Withdrawal Act (P.L. 102-579, as amended), satisfies the WIPP Waste Acceptance Criteria, and receives regulatory approval under 40 CFR 191 and RCRA for disposal at WIPP.

Mr. Visclosky. If so, what is DOE's strategy for obtaining the assurance that WIPP's acceptance criteria can be revised to accept this waste?

Mr. Rispoli. There are no current plans to change WIPP's acceptance criteria. Waste can only be accepted at WIPP if it is determined to be defense-related transuranic waste, as specified in the Waste Isolation Pilot Plant Land Withdrawal Act (P.L. 102-579, as amended) and receives regulatory approval for disposal at WIPP.

Mr. Visclosky. What is DOE's strategy for addressing this waste if WIPP does not revise its acceptance criteria?

Mr. Rispoli. If the waste is determined not to be eligible for disposal at WIPP, the Department will further evaluate the nature and characteristics of the waste and will develop an appropriate disposition path, based on this analysis and available disposal options.

SAFETY INCIDENTS AT HANFORD

Chairman Visclosky. Hanford, like other DOE sites, has experienced safety incidents. For example, a 2004 investigation found that workers at Hanford had been exposed to radioactive vapors from underground waste storage tanks. In July 2007, more than 80 gallons of radioactive and hazardous waste spilled onto the ground as it was being pumped between underground tanks at the Hanford site. Up to 12 workers later reported health problems from their exposure to the spilled waste. In addition, work emptying the tanks ceased for more than 6 months. What steps, if any, has DOE taken to improve safety performance at the Hanford site?

Mr. Rispoli: The protection of our workers, the public, and the environment are paramount to the Department's cleanup mission at Hanford. When incidents do occur, the Department takes immediate action to protect human health and the environment, undertake in-depth analyses to understand the root causes, and develop corrective actions.

The Department is using a number of tools to keep workers safe and improve safety performance at sites such as Hanford. Integrated Safety Management is the basis of our safety program across the Department's sites. It involves the integration of safety awareness and practices into all aspects of work performance. Integrated Safety Management provides a formal process where workers plan, perform, assess, and improve the safe conduct of work, down to each and every task.

Recently, as part of our ongoing effort to continuously improve safety performance, and in response to our Environmental Management initiative to strengthen safety, Hanford senior management implemented a Human Performance Initiative (HPI) pilot that included DOE and its prime contractors. HPI is a tool that has been very successful in reducing the occurrence of events in the commercial power industry. Results of the pilot indicate that the effort and resources expended to implement HPI tools are worthwhile, improve operational performance, and improve Integrated Safety Management implementation.

The Hanford injury rates have substantially improvement over several years. For example, the Hanford Total Recordable Case (TRC) incidence rate for 2006 was 1.0 case per 200,000 workhours and for 2007 it was 0.8. The rate of injury cases that include lost time for 2006 was 0.5, while the rate in 2007 was 0.3. These Hanford injury rates are significantly below the comparable national construction and waste disposal industry injury rates. The comparative 2006 TRC rates for the construction and waste disposal industries were 5.9 and 6.5, respectively, while the lost time injury rates for these industries were 3.2 and 3.9. National industry injury rates are not yet available for 2007.

Oversight of the contractor's operations has been enhanced through the selective hiring of technical expertise in individual critical areas of nuclear operations called Safety System Oversight experts (SSOs), increased numbers of Facility Representatives that perform daily safety oversight in the field and an increase in radiological conduct of operations personnel that view how the contractor's performance meets verbatim compliance with their Radiological Protection Program. Combined, the process of Integrated Safety Management, changing human performance through the Human Performance Initiative and increased oversight expertise is leading to an improved safe work environment at the Hanford Site.

CLEANUP PROJECTS AT THE HANFORD SITE

Chairman Visclosky. DOE's Hanford site has 177 underground tanks that store nearly 57 million gallons of radioactive and hazardous waste byproducts from plutonium production. DOE has not met current milestones laid out in the Tri-Party Agreement and new milestones are currently being renegotiated. All told, the costs of DOE's current strategy to treat and permanently dispose of this waste could total $70 billion or more and the timeframes for completion may be 2050 or later.

Given DOE's failure to meet past cost and schedule commitments for dealing with this waste, what assurance does the Congress have that DOE will actually meet new cost and schedule commitments?

Mr. Rispoli. While the Department has successfully met many Tri-Party Agreement (TPA) milestones, there were others that could not be met. Reasons include seismic and other technical issues encountered during the design and construction of the Waste Treatment and Immobilization Plant (WTP), a first of its kind facility designed to treat all of the high-level radioactive waste in Hanford tanks, as well as challenges experienced when removing difficult waste forms from the single-shell tanks to the extent required by the TPA. The Department has addressed these issues with resolve, drawing upon some of the best seismic, process design, and waste management experts in the nation.

The Environmental Management program has made a concerted effort during the past several years to bring its project and contract management capabilities up to "best in class." As part of this effort, we have now put in place, independently reviewed, and validated cost and schedule baselines for the tank farms and WTP projects at Hanford, and have certified earned value management systems (EVMS) in place for these projects, in particular the WTP. We have put in place a Manager and Deputy Manager of the Office of River Protection with strong management credentials, particularly in the areas of safety and construction, and have hired additional project management, technical, procurement, and financial management staff. With these capabilities in place, we have enhanced project and technical oversight, and have instituted strong project control and management principles.

Chairman Visclosky. The radioactive waste contained in Hanford's underground tanks is naturally decaying over time. In less than 100 years, the concentrations of radioactivity for the vast majority of the two primary radioactive waste constituents and their decay products will have decrease by 90 percent. Given (a) the mounting costs and ever-lengthening timeframes for completing the treatment and disposal of Hanford's tank waste and (b) the natural reduction of radioactivity over time:

Are there other waste treatment options that would be more cost-effective?

Mr. Rispoli. In addition to the two major fission products (cesium and strontium) referenced in your question, Hanford's tank wastes also contain other long-lived radionuclides such as technetium-99, with a half-life of 211,000 years, and plutonium-239, with a half-life of 24,000 years. Consequently, although the primary fission products decay to low levels during the first few hundred years, certain waste constituents will remain hazardous for tens of thousands of years.

Because of the high cost and limited space available in the national repository, the Department's strategy calls for separating the large mass of low activity wastes (LAW) in Hanford's tank waste from the bulk of the radionuclides. This separation process will reduce the volume of high-level radioactive waste (HLW) disposed of at the repository by a factor of ten and result in more than ninety percent of the tank waste volume (but only a small percentage of the radioactivity) being disposed of on-site at Hanford as LAW. The Department is evaluating options for optimizing the treatment of the LAW fraction. Options being evaluated in that study include enhancing the WTP LAW Vitrification Facility to enhance the throughput of the vitrification process, developing an interim pretreatment system to enable WTP LAW vitrification to occur several years in advance of full WTP startup, and the potential use of non-WTP LAW immobilization technologies such as bulk vitrification, steam reforming, or a cement-based cast stone to increase LAW immobilization capability.

The Department believes that this strategy (separating the waste into high-level and low-activity waste fractions for disposal off-site and on-site, respectively) is sound and its analyses of options are limited to exploring opportunities within this strategic framework.

CONTRACTOR PERFORMANCE

Chairman Visclosky. The Office of Science recently released a "report card" on the performance of its ten laboratories. It is useful to have this information publicly available, and to be able to compare contractor performance with contractor fees earned. This enables everyone, both in Congress and the public, to understand how DOE contractors are performing and how that performance relates to their compensation. Why doesn't the Office of Environmental Management issue a similar "report card" on the performance of all of its major cleanup contractors?

Mr. Rispoli. EM will evaluate the Office of Science procedures and practices for contractor performance reporting and determine if it would be beneficial in developing an EM specific fee performance reporting system.

DOE DEFENSE WASTE

Chairman Visclosky. As currently authorized, what fraction of the EM high-level waste can go into the Yucca Mountain repository?

Mr. Rispoli. The Yucca Mountain Repository is authorized to accept 70,000 metric tons of heavy metal (MTHM) of spent nuclear fuel (SNF) and high-level waste (HLW). Ten percent, or 7,000 MTHM, of the authorized limit is allocated to defense-related HLW and SNF. Of this capacity, 4,667 MTHM is planned for the disposal of HLW in canisters and 2,333 MTHM for DOE SNF. Using the standard estimate, each canister of HLW is equivalent to 0.5 MTHM; therefore, 9,334 canisters of HLW (or 40 percent) of a total of 22,600 canisters projected to be produced, can be disposed of in the repository. It should be emphasized that these canister projections are based on current management plans and treatment technologies. Also, the Administration has submitted legislation to Congress which, among other items, would remove the 70,000 MTHM cap on Yucca Mountain. As HLW immobilization activities are implemented at Department sites, as few as 16,700 canisters and as many as 33,100 canisters could be produced.

ADDITIONAL CLEANUP RESPONSIBILITIES

Chairman Visclosky. The NNSA has a plan for consolidating the footprints t the Y-12 plant and disposing of excess facilities. Similarly, the Oak Ridge National Lab also has a plan to modernize its central campus, which will require the disposal of excess facilities. Some of these facilities are just old, but especially at Y-12 there may be facilities with significant radioactive contamination. In the absence of a five-year plan, we see no evidence that Environmental Management is prepared to receive a major influx of contaminated facilities from these other programs. Does your internal outyear planning assume the transfer of facilities from Y-12 and ORNL to EM?

Mr. Rispoli. Our current baselines do not assume transfer of additional facilities at Y-12 and ORNL. However,. the Oak Ridge Operations Office is leading a diverse team with representatives of the Office of Science, the National Nuclear Security Administration (NNSA) and the Environmental Management (EM) program to develop an integrated approach for this extensive and challenging work to address not only excess facilities but contaminated soil, ground and surface waters.

Chairman Visclosky. What is the estimated cost to EM for the cleanup of these facilities?

Mr. Rispoli. Consistent with DOE Order 413.3A, the cost range will be established upon approval of Critical Decision 1 by the Secretarial Acquisition Executive.

Chairman Visclosky. What other sites, laboratories, or program offices are contemplating significant shifts of facilities to be handed off to EM for cleanup and disposal?

Mr. Rispoli. In addition to the facilities discussed on the Oak Ridge Reservation, more than 75 additional facilities have been nominated by NNSA, Science and the Office of Nuclear Energy (NE) at Argonne National Laboratory, Brookhaven National Laboratory, Stanford Linear Accelerator Center, Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Idaho National Laboratory, and Savannah River Site.

Chairman Visclosky. What is the DOE guidance or process used to decide which facilities should be cleaned up by the parent program offices and which should be transferred to Environmental Management?

Mr. Rispoli. The Deputy Secretary recognized EM's expertise in the area of decommissioning and directed me in the FY 2008 budget decisions to renew planning for excess facilities from other program offices. To that end, the Department is using the process outlined in DOE Order 430.1B, *Real Property Asset Management*, and its associated guidance, which outlines the acceptance criteria for transferring facilities from one DOE program to another. In summary, EM has expertise in decommissioning contaminated facilities and is to plan for an orderly transfer of those facilities. The Assistant Secretary requested nominations of excess facilities for the first time in several years in December 2007. Inputs have been received from NNSA, Science and NE. We are in the process of evaluating those nominations for adherence to the acceptance criteria, and evaluating how much it will cost and when those facilities might be scheduled for transfer and decommissioning.

HANFORD

Chairman Visclosky. Is the cleanup of groundwater contamination now the top priority for the State and Federal regulators at the Hanford site?

Mr. Rispoli: Our understanding, based on discussions with the State of Washington and the U. S. Environmental Protection Agency is that the cleanup of groundwater contamination is one of their top priorities.

Chairman Visclosky. Please explain why your budget request is still $690 million for the Waste Treatment Plant, despite the performance problems for this project and the shift in regulator priorities?

Mr. Rispoli. With regard to regulators priorities, the Department's understanding with Washington State and the U.S. Environmental Protection Agency (EPA) is that they still consider construction of the Waste Treatment and Immobilization Plant (WTP) and tank waste cleanup as among the top priorities for the Hanford Site.

The $690 million in annual funding for the WTP is based on the independently reviewed, validated, and approved baseline for that project, and is necessary to ensure the plant will be constructed, tested, and ready to begin treatment of Hanford's tank waste in 2019. The WTP is the cornerstone of the Department's strategy to retrieve and immobilize the highly radioactive waste stored in Hanford's aging underground tanks.

The Department has successfully addressed or is currently addressing several technical and management issues, such as seismic design criteria, that previously impacted the WTP schedule. The Department is on course for starting the WTP in 2019. To stay on that schedule, the independently validated baseline requires $690 million in annual WTP funding.

Chairman Visclosky. This Committee has no interest in appropriating more than $2 billion per year to the Hanford site. If groundwater remediation is growing in importance, what other lower-priority work will be displaced?

Mr. Rispoli. In planning its environmental cleanup efforts and developing the budget for those activities, the Department seeks to focus on work that will produce the greatest environmental benefit and the largest amount of risk reduction. The Department strongly believes that setting priorities and establishing work plans in this way is the most effective use of taxpayer funds and will have the greatest benefit, at the earliest possible time, to the largest number of people. In determining these priorities, the Department works closely with federal and state regulators, and will seek the cooperation of those entities in helping evaluate needs and focus work on the highest environmental priorities based on current knowledge, particularly where doing so necessitates modification of cleanup milestones embodied in prior agreements with DOE.

The 2009 Budget proposes $1.9 billion for the Hanford site including $690 million for the Waste Treatment Plant and $170 million (an increase of $65 million) for groundwater remediation. The proposed funding reflects the prioritization discussed above and we hope the Committee will support the requested funding.

H-CANYON ACTIVITIES AT SAVANNAH RIVER

Chairman Visclosky. I want you to be very clear about something with the Committee. The Department proposes to ship aluminum-clad spent fuel from Idaho to Savannah River in preparation for processing that fuel at H-Canyon in FY2009. Is that correct?

Mr. Rispoli. Yes, consistent with existing DOE public decisions pursuant to the National Environmental Policy Act, all aluminum-clad spent fuel is to be consolidated at the Savannah River Site, while non-aluminum-clad spent fuel is to be consolidated at Idaho. Shipments of spent fuel from the two sites could begin as early as late FY 2009.

Chairman Visclosky. Is it also correct that DOE will use chemical processes to separate out plutonium and other radioisotopes from this spent fuel?

Mr. Rispoli. Yes, the highly radioactive fission products and the very small amount of plutonium in the spent fuel will be chemically separated from the uranium and transferred to the radioactive liquid waste system for ultimate stabilization. The uranium in the spent fuel will be recovered, blended down to a low enrichment, and sold to an end user for use in manufacturing fuel for commercial nuclear reactors.

Chairman Visclosky. Given the political sensitivity regarding reprocessing of spent fuel, will you agree that these H-Canyon activities constitute reprocessing?

Mr. Rispoli. With respect to spent fuel, during the Cold War years the term "reprocessing" generally meant the separation of the fission products from the uranium, and then recovering the uranium for the purpose of using it to manufacture new fuel for reactors that were being used to irradiate target material to transmute it into plutonium that would subsequently be recovered and used in weapons.

The activities being conducted today in the H-Canyon facilities are for an entirely different purpose. Although processing the spent fuel in H-Canyon will separate the uranium from the fission products and plutonium, the uranium in the spent fuel will be recovered for use in civilian reactors to generate electricity, not as part of some weapons production activity. It is important to note that blending down the recovered uranium makes it no longer weapons-usable, and supports U.S. nonproliferation objectives. The fission products and plutonium resulting from processing the spent fuel will be discarded as high activity waste to the liquid waste tanks for eventual vitrification in the Defense Waste Processing Facility. This will have the benefit of significantly reducing the volume of waste generated, realizing the energy production value of the material, and supporting our nation's nonproliferation objectives.

Chairman Visclosky. Are there any other places in the DOE complex that are engaged in reprocessing at any greater than the laboratory "bench scale"?

Mr. Rispoli. No. H-Canyon is the last production-size chemical separation facility in the United States, and therefore is an invaluable asset in our nuclear material disposition and threat and risk reduction efforts.

IDAHO CLEANUP

Chairman Visclosky. Will DOE meet its regulatory milestones to have all of the tanks empty by 2012? If not, what are the consequences of missing that milestone?

Mr. Rispoli. The Department is evaluating the impact of a possible delay in construction of the Sodium Bearing Waste Facility. The tanks storing the waste to be treated at the Sodium Bearing Waste Facility are continually monitored and are in very good condition. Consequently, the Department is evaluating redirecting funding to greater risk-reduction projects, such as retrieval of buried waste at the Idaho National Laboratory (INL) Subsurface Disposal Area. This evaluation includes identification of savings opportunities, as well as schedule impacts to operations. A full 24-month delay would likely result in emptying the tanks six to twelve months after the 1995 Settlement Agreement milestone date of December 31, 2012.

If the Department fails to satisfy the requirements in the agreement, shipments of Environmental Management (EM) spent fuel to INL could be suspended until the tanks are emptied and the contents are treated. This potential suspension could affect EM and Office of Nuclear Energy fuel receipts, but not the Navy since its activities under the 1995 Settlement Agreement are unaffected by EM's failure to comply with the Settlement Agreement.

FUNDING AT NNSA SITES

Chairman Visclosky. DOE is requesting approximately one-quarter of a billion dollars for cleanup activities at NNSA sites. How does the risk at these sites compare to other non-NNSA sites?

Mr. Rispoli. The overall risks at NNSA sites are comparable to non-NNSA sites based on the types of waste and environmental contamination that are present. At Los Alamos National Laboratory, for instance, there are significant inventories of transuranic waste in close proximity to the public as well as soil and groundwater remediation issues near the Rio Grande and other offsite receptors.

LOS ALAMOS BASELINE

Chairman Visclosky. What is the status of the baseline for cleanup activities at Los Alamos — is it as reliable as those developed for other sites? Why is that the case for Los Alamos?

Mr. Rispoli. The Department developed the Los Alamos baseline using assumptions that may not be achievable, such as improved productivity from the new management and operations contractor at the site. EM recognizes the need to update the baseline and will make every effort to maximize risk reduction and compliance requirements as it continues to pursue cleanup goals at Los Alamos.

FIXED-PRICE REMEDIATION CONTRACTS

Chairman Visclosky. This Committee directed DOE to explore the use of guaranteed fixed-price remediation contracts for some of your cleanup work. Please explain the results of any trials you have conducted to date.

Mr. Rispoli. Throughout the mid-to latter-part of fiscal year (FY) 2007, the Department's Office of Environmental Management introduced and investigated the feasibility of implementing guaranteed fixed-price remediation (GFPR) contracting in the Department of Energy (DOE) complex. GFPR contracts work best for sites that have adequate site characterization data, well-defined regulatory closure requirements and no final decision on remedy selection. Based on these criteria, four potential GFPR Pilot Projects were identified and extensive assessments of the work scope at these sites were conducted to determine their suitability for the GFPR platform. As a result of a more detailed viability assessment, the four projects proved unsuitable for the GFPR contracting methodology for a variety of reasons. The following summarizes the details regarding EM's GFPR Candidate Projects and their viability assessments:

At the Stanford Linear Accelerator Center (SLAC) the cleanup standards for remediation of contaminated soils and groundwater are currently too uncertain.

- At the Brookhaven National Laboratory (BNL) there were no regulatory drivers for the demolition of a reactor fan house and the remediation of proximate soils; therefore, there were no opportunities for process efficiencies for cost and schedule savings.
- At the Separations Process Research Unit (SPRU) at the Knolls Atomic Power Laboratory there were no unique alternatives for the soils and groundwater remediation, other than soil removal, and there was a risk that soil removal volumes could not be adequately estimated.
- At the Savannah River Site - Gun-Site 012 and Gun-Site 218 remediation project, characterization results showed only background and incidental contamination at these sites.

In the course of the last year, the environmental insurance companies that underwrite GFPR contracts have also changed their procedures dramatically. When the Department began its GFPR consideration, the environmental insurance carriers were underwriting remediation projects for up to 100% of the firm fixed price (FFP) of the contracts. Over time, the policies of the insurance companies have changed as a result of losses the companies were experiencing from natural disasters and other GFPR contracts due to contractor claims. As a result, the insurance industry has increasingly become discriminatory in its underwriting practices to the point where GFPR policies are only offered to a specific dollar value and are increasingly restrictive, limiting possible applications to our projects.

Nonetheless, EM is continuing efforts to identify new GFPR candidates and resume the viability assessments. The renewed search will commence under the knowledge and scrutiny of the assessments that have preceded it and in light of the changing dynamics of the environmental insurance industry.

EM CONTRACTING STRATEGIES

Chairman Visclosky. The DOE cleanup budget has been getting squeezed the past six years. The Administration has been leaving it up to the Congress to add funding to continue progress on legally driven clean up responsibilities at DOE sites across the complex. On the ground the outcome of the budget cuts is an even greater proportional reduction in actual cleanup. The DOE sites have to pay for the basic operating expenses in order to keep the lights on and execute the basic safety programs so those activities continue to get funded. What gets delayed, pushed out and not done is actual cleanup progress?

Mr. Rispoli. The safety of our workforce and the communities surrounding our sites takes first precedence in funding decisions. After that, we direct funding to reduce the greatest risks as we continue to make progress in cleanup at DOE sites. We also continue to challenge our contractors, who are our cleanup partners, to be creative and think out of the box in their approach to cleanup issues to identify more innovative, cost-effective solutions.

EM CONTRACTING STRATEGIES

Chairman Visclosky. Mr. Rispoli, what programmatic or contracting strategies are you pursuing that ensure you have the most efficient, cost-effective operations at the sites in order to realize cost savings that can then be used for actual clean up activities?

Mr. Rispoli. The Office of Environmental Management (EM) is pursuing efficiencies on several fronts, including contract approaches, implementation of innovative technologies, and technical strategies. The Department's cleanup contracts are performance-based, where fee is earned based on measureable results. We incentivize the contractor by means of "stretch" performance incentives, where the contractor will get increased fee by producing above and beyond target amounts. For example, at a given cleanup site, if the contractor prepares more than the target number of drums for disposal of transuranic waste each year, additional fee can be earned for going beyond the target amount. Some incentives built into contracts have the Government sharing cost savings with the contractor. We are also incentivizing schedule reductions. If those milestones are achieved earlier than agreed, the contractor may earn additional fee for early finish dates. Whatever the funding level each year, we look to our contractors as partners in being creative and innovative to maximize their performance.

EM recently issued its Engineering and Technology Roadmap, which details strategic initiatives aimed at reducing project technical risk and uncertainty. The Roadmap seeks to build on EM's previous successes in technological innovation, which have contributed greatly to the enhanced safety, effectiveness, and efficiency of our projects. The Roadmap will guide the development of an increasingly strong and responsive applied research and engineering program. Specifically, the Roadmap consists of thirteen strategic initiatives that address anticipated technical risks and uncertainties in the following six areas: waste processing; groundwater and soil remediation; deactivation and decommissioning and facility engineering; spent nuclear fuel; challenging materials; and integration and cross-cutting initiatives. These initiatives will help ensure continued success in completing the cleanup of contaminated nuclear weapons manufacturing and testing sites across the United States.

EM is evaluating strategies for reducing the EM footprint across the complex to lower fixed landlord costs and maximize return on investment by reallocating those costs to actual cleanup activities. The approach balances EM's priorities of regulatory compliance, best business practices, and shared stakeholder vision. Some strategies being considered include bringing forward in the baseline schedules decontamination and decommissioning and small site completions, and developing and implementing alternative approaches to processing surplus nuclear materials, spent fuel, and tank waste. EM has been developing analytical building blocks (ABBs) linked to each site's certified baseline at the sub-PBS level. This lower level breakdown of EM's work scope allows us to build scenarios and conduct alternative analyses for the purpose of demonstrating ways to lower EM's risk sooner and achieve cost savings.

THURSDAY, MARCH 13, 2008.

## DEPARTMENT OF ENERGY—SCIENCE RESEARCH

### WITNESS

**RAYMOND L. ORBACH, UNDER SECRETARY FOR SCIENCE**

CHAIRMAN VISCLOSKY'S OPENING REMARKS

Mr. VISCLOSKY [presiding]. I want to bring the hearing to order.

And, first of all, I certainly want to acknowledge the presence of Dixon Butler, who is making what apparently is a great recovery.

It is good to see you here, Dixon.

Give him a round of applause. [Applause.]

And on another, personal note, Shari Davenport, who is just coming in the door now, worked strenuously all week and yesterday, completely through her birthday. But the reason I note that is, last night, we were at a dinner, and the waiter asked for her ID before he served her a glass of wine at the reception. [Laughter.]

And so, it was a——

Mr. HOBSON. That doesn't happen to me anymore. [Laughter.]

Mr. VISCLOSKY. So I just wanted to note that for the record, if we could.

Good morning, Dr. Orbach. Thank you for appearing before us to discuss the fiscal year 2009 budget request for the Office of Science.

Your office is something of an anomaly in the Department of Energy. You do your best to deliver on promises made to this committee and to follow the law of the land, a philosophy that other programs within DOE should adopt.

Without your competent management, I would dismiss out of hand the 19 percent increase for Science, given that the President's request savages other energy and water programs under the subcommittee's jurisdiction.

Before we get into the details of the budget request, I would like to highlight some of the bright spots in your program. The U.S. continues to lead scientific advancements in many areas. The Joint Dark Energy Mission is moving forward. You have proposed the Energy Frontier Research Centers initiative, an outgrowth of workshops held to identify key basic research obstacles to technological progress in critical energy issues. And the integration of research and development across the Department of Energy.

And, Dr. Orbach, I know this has been a difficult year for the Office of Science, but I confess I am at a loss when confronted with people who accuse this committee of cutting the Office of Science.

In fiscal year 2007, Science received a $200 million increase in funding in the continuing resolution over fiscal year 2006. I would point out that that was one of the very few adjustments this com-

mittee made across the government at a very difficult time in the C.R.

In the fiscal year 2008 House bill, the office received an increase of $717 million more than 2007. However, given a less generous funding level in the other body and multiple threats of a veto from President Bush, this subcommittee had to integrate House and Senate priorities with a much smaller allocation. As a result, the Office of Science received an increase of only $220 million over fiscal year 2007.

I am not a logician, and therefore, when looking forward to 2009, I fail to comprehend the President's logic in requesting a huge increase for Science while cutting funding for Energy Efficiency and Renewable Energy programs by $467 million. I fail to comprehend the reason behind requesting a huge increase in Science while decimating the DOE environmental cleanup accounts and the water programs under our jurisdiction by more than $1 billion.

From my perspective, floods kill people. The lack of navigation facilities impedes commerce and the economy. People's health is in danger if their drinking water is not clean. Contamination at DOE facilities poses immediate health risks. These and many other programs under our jurisdiction now also require attention.

Dr. Orbach, I do look forward to discussing with you the choices made in fiscal year 2008 execution and priorities in the Office of Science fiscal year 2009 budget request for out-year planning and overall management.

We are under serious time constraints, as you probably know, and certainly would ask that, between yourself, your office and OMB, for not only the requests made as far as questions today but those for the record, that responses be provided to the committee within 4 weeks.

And I would ask members for any additional questions and comments they have, if they could get those to the committee by close of business today.

But, with that, I would like to yield to Mr. Hobson for any opening remarks that he has.

## MR. HOBSON'S OPENING STATEMENT

Mr. HOBSON. Thank you, Mr. Chairman.

Good morning, Dr. Orbach. It is always a pleasure to have you before the committee.

Dr. Orbach, you were sworn in as director of the Office of Science back in March of 2002 and were promoted to Under Secretary of Science in 2006.

It is hard to imagine that we have been working with you for 6 years now. Some people tell me that time just seems to pass by faster for more mature folks like you and me. And I prefer to stick with the explanation that time really does fly by when you are having fun. Maybe not today, but——

[Laughter.]

Mr. HOBSON. Seriously, Dr. Orbach, you are one of the few senior managers at the department that has earned the trust and respect of members on both sides of this subcommittee.

I believe that what you have accomplished in the Office of Science will live on long after the end of your tenure in this job.

The advances we are making in high-end scientific computing alone will make your 6 years worthwhile. We are far ahead of what we all thought was possible just a few years ago when you and I talked.

We also value your long-term vision for the Science program and the Science labs and your willingness to understand congressional concerns and to work with the committee to address those concerns. It is too bad that some otherwise smart people at the department can't figure out the most basic principles of getting along with Congress. And I won't name names. But I should. [Laughter.]

You have been a strong advocate for increased investment in basic science research at the Department of Energy, and it is unfortunate that politics last fall between the White House and Congress led to less funding than you had hoped for in fiscal year 2008.

I hope you believe me when I say that the funding outcome last year is not a reflection on you or on this committee's view of the Office of Science. As Chairman Visclosky very eloquently explained, we have to balance many competing priorities—a challenge that becomes nearly impossible when we are constrained by artificially low budget requests for our energy and water programs.

I hope the next administration will recognize the need to spend enough money to take care of this nation's pressing energy and water needs. And to whomever is in the White House next year, I wish them luck in finding a replacement for you at DOE. Yours will be hard shoes to fill.

Before I end, I also want to welcome back Dixon Butler today. It is great to see him up and about again. And we wish him well in his recovery. He didn't want to miss this Science hearing for anything, and he really worked to come back for this hearing.

And it is nice to see you, Dixon.

Thank you, Mr. Chairman.

And welcome, Ray.

Mr. VISCLOSKY. Dr. Orbach.

## DR. ORBACH'S OPENING STATEMENT

Dr. ORBACH. Thank you, Chairman Visclosky, Ranking Member Hobson, for your wonderful remarks. They are very kind. And I, too, am thrilled to see Dixon Butler back with us.

Members of the committee, I am pleased to be able to appear before your committee for what I do expect to be my final budget presentation for the Department of Energy's Office of Science. I would like to thank the committee for your support for the Office of Science during my tenure—strong support.

The president's budget request for fiscal year 2009 continues his strong and clear support for science in this country, expressed through his American Competitiveness Initiative and Advanced Energy Initiative, both announced in 2006.

Congress has shown strong bipartisan support for an aggressive innovation and energy security agenda through the Energy Policy Act in 2005 and the America COMPETES Act and the Energy Independence and Security Act in 2007.

And we are grateful to the Committee on Science and Technology for its very recent views and estimates, fiscal year 2009 report, which states, "The fiscal year 2009 budget for the DOE Office of

Science of $4.7 billion is a step forward in addressing our near- and long-term needs. Strong support for basic energy research is needed to achieve major breakthroughs in technologies that will enable our country to secure the energy supplies we need for the future while addressing the challenges of climate change."

The president's fiscal year 2009 request to Congress for the Office of Science creates a bipartisan platform for long-term economic health, energy security and the intellectual strength of our country.

Just a few examples.

We are introducing the concept of Energy Frontier Research Centers to accelerate scientific breakthroughs and innovations essential to the development of advanced energy technologies in the 21st century.

We are providing $100 million in fiscal year 2009 to award grants of $2 million to $5 million per year, on a competitive basis, to groups of researchers in universities, laboratories, industry and other institutions for an initial 5-year period.

We seek to engage the nation's finest intellectual and creative talent to tackle the scientific grand challenges associated with how nature works to direct and control matter at the quantum, atomic and molecular levels and to harness this new knowledge and capability for some of our most critical energy challenges.

Another example is ITER. While the fiscal year 2008 appropriation for ITER was reduced to R&D, the president's 2009 request calls for the full $214 million required to fully engage in this crucial experiment. It is high-risk, but the potential for energy security is immense. ITER will directly benefit U.S. domestic industries, creating an American workforce knowledgeable in R&D and in the production of high-tech components for the fusion industry.

My last example is high-energy physics. The president's request firmly places this critical field back on track for U.S. world leadership.

Former Princeton University president Harold Shapiro led the recent National Academy of Sciences' study on elementary particle physics in the 21st century. He stated, "The United States has been at the forefront of elementary particle physics for more than half a century. Particle physics inspires U.S. students, attracts talent from around the world, and drives critical intellectual and technological advances in many other fields. The United States has an unprecedented opportunity, as a leader of nations, to undertake this profound scientific challenge."

President Shapiro's last sentence applies equally across the frontiers of basic research in science. The Office of Science has prioritized its investment to maintain U.S. global scientific leadership. The president's fiscal year 2009 request to Congress gives us the chance to be a leader of nations. I urge this committee to give our country and its citizens that opportunity.

I thank you for your strong support for the Office of Science and for basic research, and I look forward to answering your questions.

[Statement of Dr. Raymond L. Orbach:]

**Statement of Dr. Raymond L. Orbach**
**Under Secretary for Science**
**U.S. Department of Energy**

**Before the**
**Subcommittee on Energy and Water Development**
**House Committee on Appropriations**

**Regarding FY 2009 Research**
**and Development Budget Proposal**

**March 13, 2008**

Thank you Mr. Chairman, Ranking Member Hobson, and Members of the Committee. I am pleased to appear before your Committee for what I expect to be my final budget presentation for the Department of Energy's Office of Science. I would like to thank the Committee for your strong support for the Office of Science during my tenure. This support has enabled the Office of Science to make investments in basic research and advanced research capabilities that have and will continue to improve U.S. global competitiveness, energy security, the environment, and our fundamental understanding of the universe around us.

Our Nation continues to face significant challenges in energy security and in our ability to maintain the scientific leadership and innovation that assures our continued economic security. These challenges are addressed by the President in his American Competitiveness Initiative and Advanced Energy Initiative announced in 2006. In this year's State of the Union address, the President again called our attention to the importance of harnessing the creative genius of American researchers and entrepreneurs in developing the next generation of clean energy technologies and in keeping our Nation at the forefront of basic research in the physical sciences. The budget request for FY 2009 demonstrates his forceful, continued commitment to these important initiatives. The Congress has also spoken and expressed strong, bipartisan support for an aggressive innovation and energy security agenda in passing the Energy Policy Act (EPAct) of 2005 and in following up with both the America COMPETES Act and the Energy Independence and Security Act (EISA) in 2007.

EPAct and the COMPETES Act both recognize the pivotal role of the Office of Science in securing the advantages that basic research as well as science, math, and engineering education can bring to the Nation. EISA's provisions are intended to reduce America's dependence on oil, improve efficiency, and cut emissions. Technology development proceeds fastest where there is a strong grounding in scientific understanding, but we will not meet the targets with solely incremental improvements in current technologies. We need the breakthroughs that will result only from transformational basic research.

Here are a few examples. EISA mandates the use of at least 36 billion gallons of biofuels by 2022. Without transformational breakthroughs in deriving fuels from plant cellulose materials, we reduce our chances of reaching these aggressive goals. Even though conventional approaches, such as sugar-based and corn-based ethanol, can be modestly energy positive—although this is still debated—they consume large quantities of food and feed grain. Increasing use of these feedstocks raises environmental concerns associated with land use changes and impacts on atmospheric concentrations of carbon dioxide. Biofuels derived from cellulose, and in particular feedstock crops such as switchgrass that can be grown on marginal land with minimal water and nutrient requirements, can provide the basis for a sustainable biofuels economy in the U.S. while benefiting the American farmer. Breakthroughs in science are essential for the development of more efficient and cost-effective processes for deriving fuels from cellulose and for developing dedicated feedstock crops. The approaches to cellulosic ethanol deployed in many pilot and demonstration bioethanol plants across the United States rely on niche feedstocks and conversion technologies that are not yet cost competitive. New scientific discoveries supported by the Office of Science will speed revolutionary gains in production efficiencies and cost reduction – and in some cases may be the only way to meet our goals.

The transformational basic research undertaken by the Office of Science's Bioenergy Research Centers is one way the Department is addressing the difficulties of cost-effective bioethanol production with minimal environmental footprint, by using plant and microbial genomics and other novel approaches.

EISA also mandates a national fuel economy standard of at least 35 miles per gallon by 2020—an increase in fuel economy of some 40 percent that will save billions of gallons of fuel. Automobile manufacturers will need to employ numerous conventional and advanced engine and vehicle technologies to reach this goal. Office of Science basic research will be critical in the development of cost effective advanced engine and vehicle technologies through research in areas such as high-strength, low-weight materials; electrical energy storage; hydrogen production, use, and storage; fuel cell materials; catalysts, combustion processes, and materials under extreme environments.

In FY 2009 the Office of Science will initiate Energy Frontier Research Centers. They will pursue innovative basic research to accelerate the scientific breakthroughs needed to create advanced energy technologies for the 21st century. These Centers will pursue fundamental basic research areas mentioned above as well as solar energy utilization; geosciences related to long-term storage of nuclear waste and carbon dioxide; advanced nuclear energy systems; solid state lighting; and superconductivity.

The Office of Science seeks to engage the Nation's intellectual and creative talent to address scientific grand challenges. These are the necessary transformational discoveries which will fundamentally alter our approaches to energy production and use, and they will come from the next generation of scientists, mathematicians, and engineers. If our FY 2009 request is approved, the Office of Science will be able to directly support the research of more than 4,300 graduate students – and many more who are supported by other agencies will use our world-leadership scientific research facilities in their dissertation research.

The Office of Science is accelerating the pace of discovery and innovation to address the Nation's energy needs through our multifaceted research portfolio. Your confidence in the Office of Science is based on a number of demonstrated successes in our mission areas, and your support for the Office of Science has enabled us to assess the basic research needs and engage the scientific community to respond aggressively. We routinely assess and update these research opportunities and priorities with an eye to our mission and with an ear to the research community, whether at a national laboratory, a university, or in industry. Since we build and operate large-scale, long-term, and, by necessity, cost-effective scientific research facilities, and because our mission is so important, we take these assessments seriously. We cannot afford to go in a wrong direction; we need the most complete and robust analysis of scientific opportunity, mission need, cost, and benefit.

A large part of this assessment effort in recent years has been accomplished through a series of Basic Research Needs workshops and other workshops led by our science programs in partnership with the Department's technology programs. These workshops have brought together subject experts with diverse views from the broader basic and applied research community to discuss and identify areas of focus for DOE's basic research efforts. These efforts

have enabled the Office of Science to stay informed of research needs and new opportunity areas, as well as scientific and technological roadblocks, and have enabled us to create a prioritized and comprehensive research portfolio within our available funding.

While these workshops are critical to building and balancing our research portfolio, we also have a number of planning and advisory resources at our disposal to inform our long-term research portfolio planning. The National Academy of Sciences, our Federal Advisory Committees, informal and formal communication with the international scientific community, OSTP, OMB, the Congress, and our in-house Office of Science personnel all play important roles. Our programs are strong because our research portfolio and facilities are internally and externally assessed regularly and because our research and facilities are awarded through a competitive merit review process.

We have established effective processes for assessing basic research needs, and we have also developed the capacity to respond quickly with highly leveraged investments in scientific facilities and research at the national laboratories and universities. This informed, rapid response provides the world-class research results that will help solve some of our most intractable energy supply and environmental challenges, while keeping our Nation's scientific enterprise and industry at the forefront.

I think the best way to bring my statement into sharp focus is to discuss some examples of how your investments in the Office of Science have brought quick and remarkable results, and what we plan to do with the funding requested for FY 2009 to enhance the U.S. scientific and innovation enterprise and ensure the best possible return to the taxpayer.

Perhaps the best example of this aggressive and nimble approach is the response by the Office of Science to the challenge of High Performance Computing (HPC). In 2002 the Japanese announced the Earth Simulator, a high performance computer for open science which combined unprecedented performance and efficiency. Congress responded by dramatically increasing HPC funding, and making the Office of Science the lead in an effort to surpass the Earth Simulator. I am pleased to report that your confidence in us has already resulted in the U.S. attaining world leadership in open scientific computing—by the end of this year we will achieve peak capacity of one petaflop at our Leadership Computing Facility in Oak Ridge. This exceptional capability is helping us model such phenomena as turbulent flows related to combustion and to model and simulate complex climate processes that will inform decision makers on climate change, mitigation, and adaptation.

The benefits of Office of Science HPC capabilities extend well beyond DOE. We provide access to these resources to other Federal agencies, universities, laboratories, and industry. We have been involved in modeling and simulation runs as diverse as determining hurricane effects to save lives, and modeling aircraft engines and airframes to improve energy efficiency and reduce time-to-market. We use the Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program to openly compete access to these world-leading HPC resources. The Office of Science created INCITE for the purpose of bringing the capabilities of terascale computing to the community in order to transform the conduct of science and bring scientific simulation through computational modeling to parity with theory and experiment as a scientific

tool. As a result, HPC modeling and simulation is now seen as a potent tool in the scientific toolbox; one that will potentially save lives, increases our energy and national security, and propels us to a competitive edge.

Another accomplishment of the past year is the successful competition and award of three Bioenergy Research Centers. These Centers will each take different approaches to discovering fundamentally new solutions and solving critical roadblocks on the path to energy security—how will we meet the new requirement to produce 36 million gallons of biofuels by 2022 from renewable plant sources that don't compete with the food supply? In authorizing and funding the Bioenergy Research Centers, Congress expressed its confidence in the ability of the Office of Science to tap the talent of our national laboratories and universities to tackle our fuels challenge, and these Centers are up and running well.

U.S. leadership in science and technology depends on the continued availability of the most advanced scientific tools and facilities for our researchers. The suite of research capabilities operated by the Office of Science and used annually by 20,000 researchers from industry, academia and government labs are still the envy of the world. And over the past several years, with your support, we have delivered new facilities and have achieved remarkable technical milestones with existing facilities, enabling the U.S. to work at the cutting-edge of many scientific disciplines. The Spallation Neutron Source, which came on line in 2006, is the world's forefront neutron scattering facility providing more neutrons, by a factor of ten, than any other neutron source in the world for research of materials and biological complexes. Let me give you just one example of why neutrons are so important. Neutrons are the only way to peer inside an operating fuel cell to view water forming and moving throughout the cell. In a fuel cell, water is formed as a by-product of the reaction between hydrogen and oxygen. If the water does not drain quickly and efficiently, then fuel cells will not work properly.

The Linac Coherent Light Source currently under construction will produce x-rays 10 billion times more intense than any existing x-ray source in the world when it comes on line in FY 2010. It will have the capabilities for structural studies of nanoscale particles and single molecules and for probing chemical reactions in real time. All five Office of Science Nanoscale Science Research Centers are now in operation, providing unparalleled resources to the scientific community for synthesis, fabrication, and analysis of nanoparticles and nanomaterials. The Tevatron at Fermilab currently remains the world's most powerful particle collider for high energy physics. New records for performance in peak luminosity were achieved in 2006, enabling the observation of the rare single top quark and bringing researchers closer to understanding the basic constituents of matter and the laws of nature at high energies.

On October 24, 2007, the international ITER Agreement went into force. The ITER experiment will demonstrate for the first time that a reactor can create and sustain a burning plasma. The implications of this research are far-reaching. The world faces a series of tough choices in meeting our energy needs over the next century. While no silver bullet may exist, fusion appears to be the closest. Fusion energy provides the real possibility of abundant, economical, and environmentally benign energy, starting around mid-century. Our investments today will have huge pay-offs for our children and grandchildren. We are part of an international consortium

that is sharing the cost and the risk of the project and will have full access to all experimental research data.

The Office of Science is aggressively pursuing a range of research areas that will provide answers critical to our future energy security, as the material that follows will show—and we also continue to plan for the future, seeking to identify opportunities within available resources and to update our priorities appropriately. An example of this is the *'Facilities for the Future of Science: A 20-Year Outlook'* report, which was released in November 2003 and updated last year. The Outlook contained a prioritized list of facilities to underpin our major research thrusts over the next 20 years and beyond. These facilities are designed to be world class and adaptable to evolving basic research needs to ensure that U.S. taxpayers get the most value for their money. These facilities also allow researchers access to the full array of physical and biological science large-scale resources, creating an all-important balance and 'unity' of science within the Office of Science. I ask the Members during this appropriations cycle especially to consider the lasting value of the basic energy research done in the Office of Science to our Nation's well-being and economic prowess.

The following programs are supported in the FY 2009 budget request: Basic Energy Sciences, Advanced Scientific Computing Research, Biological and Environmental Research, Fusion Energy Sciences, High Energy Physics, Nuclear Physics, Workforce Development for Teachers and Scientists, Science Laboratories Infrastructure, Science Program Direction, and Safeguards and Security.

**OFFICE OF SCIENCE**
**FY 2009 PRESIDENT'S REQUEST**
**SUMMARY BY PROGRAM**

(dollars in thousands)

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 | |
|---|---|---|---|---|---|
| Basic Energy Sciences | 1,221,380 | 1,269,902 | 1,568,160 | +298,258 | +23.5% |
| Advanced Scientific Computing Research | 275,734 | 351,173 | 368,820 | +17,647 | +5.0% |
| Biological and Environmental Research | 480,104 | 544,397 | 568,540 | +24,143 | +4.4% |
| High Energy Physics | 732,434 | 689,331 | 804,960 | +115,629 | +16.8% |
| Nuclear Physics | 412,330 | 432,726 | 510,080 | +77,354 | +17.9% |
| Fusion Energy Sciences | 311,664 | 286,548 | 493,050 | +206,502 | +72.1% |
| Science Laboratories Infrastructure | 41,986 | 66,861 | 110,260 | +43,399 | +64.9% |
| Science Program Direction | 166,469 | 177,779 | 203,913 | +26,134 | +14.7% |
| Workforce Dev. for Teachers & Scientists | 7,952 | 8,044 | 13,583 | +5,539 | +68.9% |
| Safeguards and Security (gross) | 75,830 | 75,946 | 80,603 | +4,657 | +6.1% |
| SBIR/STTR (SC funding) | 86,936 | —— | —— | —— | —— |
| Subtotal, Office of Science | 3,812,819 | 3,902,707 | 4,721,969 | +819,262 | +21.0% |
| Adjustments[1] | 23,794 | 70,435 | —— | -70,435 | -100.0% |
| Total, Office of Science | 3,836,613 | 3,973,142 | 4,721,969 | +748,827 | +18.8% |

[1] Adjustments include SBIR/STTR funding transferred from other DOE offices ($39,319,000 in FY 2007), a charge to reimbursable customers for their share of safeguards and security costs (-$5,605,000 in each of FY 2007 and FY 2008), Congressionally-directed projects ($123,623,000 in FY 2008), a rescission of a prior year Congressionally-directed project (-$44,569,000 in FY 2008), and offsets for the use of prior year balances to fund current year activities (-$9,920,000 in FY 2007 and -$3,014,000 in FY 2008).

**BASIC AND APPLIED RESEARCH & DEVELOPMENT COORDINATION**

I would also like to highlight the fact that the Office of Science continues to coordinate basic research efforts in several areas with the Department's applied technology offices through collaborative processes established over the last several years. These areas include biofuels derived from biomass, solar energy, hydrogen, solid-state lighting and other building technologies, the Advanced Fuel Cycle, Generation IV Nuclear Energy Systems, vehicle technologies, and improving efficiencies in industrial processes. The Department's July 2006 report to Congress *DOE Strategic Research Portfolio Analysis and Coordination Plan* identified 21 additional areas of opportunity for coordination that have great potential to increase mission success. The Office of Science supports basic research that underpins nearly all 21 areas; and six areas are highlighted in the FY 2009 Office of Science budget request for enhanced R&D coordination: Advanced Mathematics for Optimization of Complex Systems, Control Theory, and Risk Assessment; Electrical Energy Storage; Carbon Dioxide Capture and Storage; Characterization of Radioactive Waste; Predicting High Level Waste System Performance over Extreme Time Horizons; and High Energy Density Laboratory Plasmas. The Office of Science has sponsored scientific workshops corresponding to these focus areas in collaboration with related DOE applied technology program offices. The workshop reports identified high priority basic research areas necessary for improved understanding and revolutionary breakthroughs.

*Advanced Mathematics for Optimization of Complex Systems, Control Theory, and Risk Assessment*: The Advanced Scientific Computing Research (ASCR) program supports basic research in advanced mathematics for optimization of complex systems, control theory, and risk assessment. A recommendation from the workshop focused on this subject indicated additional research emphasis in advanced mathematics could benefit the optimization of fossil fuel power generation; the nuclear fuel lifecycle; and power grid control. Such research could increase the likelihood for success in DOE strategic initiatives including integrated gasification combined cycle coal-fired power plants and modernization of the electric power grid.

*Electrical Energy Storage*: About 15 percent of the Basic Energy Sciences (BES) program funding requested to support basic research in electrical energy storage (EES) is targeted for a formally coordinated program with DOE applied technology program offices. The workshop report on this focus area noted that revolutionary breakthroughs in EES have been singled out as perhaps the most crucial need for this Nation's secure energy future. The report concluded that the breakthroughs required for tomorrow's energy storage needs can be realized with fundamental research to understand the underlying processes involved in EES. The knowledge gained will in turn enable the development of novel EES concepts that incorporate revolutionary new materials and chemical processes. Such research will accelerate advances in developing novel battery concepts for hybrid and electric cars and will also help facilitate successful utilization and integration of intermittent renewable power sources such as solar, wind, and wave energy into the utility sector, making these energy sources competitive for base-load supply.

*Carbon Dioxide Capture and Storage*: BES, ASCR and the Biological and Environmental Research (BER) program support basic research in carbon dioxide capture and storage. The storage portion of this R&D coordination focus area was a subject of a BES workshop on Basic Research Needs for Geosciences in February 2007 that focused on the research challenges posed

by carbon dioxide storage in deep porous saline geological formations. The workshop report noted that the chemical and geological processes involved in the storage of carbon dioxide are highly complex and would require an interdisciplinary approach strongly coupling experiments with theory, modeling, and computation bridging multiple length and time scales. The BES effort supports fundamental research to understand the underlying chemical, geochemical, and geophysical processes involved in subsurface sequestration sites. The BER research effort focuses on understanding, modeling, and predicting the processes that control the fate of carbon dioxide injected into geologic formations, subsurface carbon storage, and the role of microbes and plants in carbon sequestration in both marine and terrestrial environments. These aspects of this focus area were also the subject of additional SC workshops that identified basic research areas in carbon dioxide capture and storage that could benefit the optimization of fossil fuel power generation and the development of carbon neutral fuels. The ASCR research effort supports two Scientific Discovery through Accelerated Computing (SciDAC) partnerships with BER to advance modeling of subsurface reactive transport of contaminants; an area that has been identified as directly relevant to carbon sequestration research efforts.

*Characterization of Radioactive Waste*: BES, BER, and the Nuclear Physics (NP) program support research in radioactive waste characterization. This R&D coordination focus area was the subject of six Office of Science workshops, including three BES workshops. The workshop reports noted that the materials and chemical processes involved in radioactive waste disposal are highly complex and their characterization requires an interdisciplinary approach that strongly couples experiments with theory, modeling, and computation bridging multiple length and time scales. The BES effort will focus on research relating to the underlying physical and chemical processes that occur under the conditions of radioactive waste storage, including extremes of temperature, pressure, radiation flux, and multiple complex phases. The BER research effort addresses processes that control the mobility of radiological waste in the environment. The NP research effort is focused on characterization of radioactive waste through the advanced fuel cycle activities. The NP program areas are structured as scientific disciplines with goals to understand the nuclear cross sections important for advanced fuel cycle reprocessing. A small portion of on-going research is relevant to the issues involved with radioactive waste and related advanced fuel cycles. The knowledge gained from this research will lead to enhanced understandings of radioactive waste characterization, which would make nuclear power a far more attractive component in primary energy usage.

*Predicting High Level Waste System Performance over Extreme Time Horizons*: BES supports basic research in predicting high-level waste system performance over extreme time horizons. This R&D coordination focus area was a subject of a BES workshop on Basic Research Needs for Geosciences in February 2007, which focused on research challenges posed by geological repositories for high level waste. The workshop report identified major research priorities in the areas of computational thermodynamics of complex fluids and solids, nanoparticulate and colloid physics and chemistry, biogeochemistry in extreme and perturbed environments, highly reactive subsurface materials and environments, and simulation of complex multi-scale systems for ultra-long times.

*High Energy Density Laboratory Plasmas*: The Fusion Energy Sciences (FES) program supports basic reach in high energy density laboratory plasmas. In May 2007, Office of Science and the

National Nuclear Security Administration (NNSA) jointly sponsored a workshop to update the high energy density laboratory plasmas (HEDLP) scientific research agenda. Three scientific themes emerged from the workshop: enabling the grand challenge of fusion energy by high energy density laboratory plasmas; creating, probing, and controlling new states of high energy densities; and catching reactions in the act by ultra-fast dynamics. In FY 2009, the FES request expands existing HEDLP research in response to the research opportunities identified in the workshop.

**BASIC AND APPLIED R&D COLLABORATION FUNDING SUMMARY**

(dollars in thousands)

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 | |
|---|---|---|---|---|---|
| Advanced Mathematics for Optimization of Complex Systems, Control Theory, & Risk Assessment | | | | | |
| Science | | | | | |
| Advanced scientific computing research | —— | 1,900 | 2,000 | +100 | +5.3% |
| Energy Efficiency and Renewable Energy | —— | —— | 500 | +500 | —— |
| Nuclear Energy | 10,000 | 19,410 | 55,000 | +35,590 | +183.4% |
| Total, Advanced Mathematics | 10,000 | 21,310 | 57,500 | +36,190 | +169.8% |
| Electrical Energy Storage | | | | | |
| Science | | | | | |
| Basic energy sciences | —— | —— | 33,938 | +33,938 | —— |
| Energy Efficiency and Renewable Energy | —— | —— | 2,000 | +2,000 | —— |
| Electricity Delivery and Energy Reliability | —— | —— | 13,403 | +13,403 | —— |
| Total, Electric Energy Storage | —— | —— | 49,341 | +49,341 | —— |
| Carbon Dioxide Capture and Storage | | | | | |
| Science | | | | | |
| Basic energy sciences | 5,915 | 5,915 | 10,915 | +5,000 | +84.5% |
| Advanced scientific computing research | —— | 976 | 976 | —— | —— |
| Biological and environmental research | 16,841 | 16,874 | 17,374 | +500 | +3.0% |
| Total, Science | 22,756 | 23,765 | 29,265 | +5,500 | +23.1% |
| Fossil Energy | 97,228 | 118,908 | 149,132 | +30,224 | +25.4% |
| Total, Carbon Dioxide Capture and Storage | 119,984 | 142,673 | 178,397 | +35,724 | +25.0% |

| | (dollars in thousands) | | | | |
|---|---|---|---|---|---|
| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 | |
| Characterization of Radioactive Waste | | | | | |
| Science | | | | | |
| Basic energy sciences | — | — | 8,492 | +8,492 | — |
| Biological and environmental research | — | — | 1,500 | +1,500 | — |
| Nuclear physics | 200 | 200 | 6,603 | +6,403 | +3,202% |
| Total, Science | 200 | 200 | 16,595 | +16,395 | +8,198% |
| Nuclear Energy | 37,190 | 53,722 | 59,000 | +5,278 | +9.8% |
| Environmental Management | 2,100 | 2,100 | 9,500 | +7,400 | +352.4% |
| Total, Characterization of Radioactive Waste | 39,490 | 56,022 | 85,095 | +29,073 | +51.9% |
| Predicting High Level Waste System Performance Over Extreme Time Horizons | | | | | |
| Science | | | | | |
| Basic energy sciences | — | — | 8,492 | +8,492 | — |
| Environmental Management | 500 | 500 | 1,500 | +1,000 | +200.0% |
| Total, Predicting High Level Waste System Performance | 500 | 500 | 9,992 | +9,492 | +1,898% |
| High Energy Density Laboratory Plasmas | | | | | |
| Science | | | | | |
| Fusion energy sciences | 15,459 | 15,942 | 24,636 | +8,694 | +54.5% |
| National Nuclear Security Administration | 10,000 | 12,295 | 10,147 | -2,148 | -17.5% |
| Total, High Energy Density Laboratory Plasmas | 25,459 | 28,237 | 34,783 | +6,546 | +23.2% |
| Total, Basic and Applied Research Collaborations | 195,433 | 248,742 | 415,108 | 166,366 | +66.9% |

## CONCLUSION

I want to thank you, Mr. Chairman, for providing this opportunity to discuss the Office of Science research programs and our contributions to the Nation's scientific enterprise and global competitiveness. On behalf of DOE, I am pleased to present this FY 2009 budget request for the Office of Science.

This concludes my testimony. I would be pleased to answer any questions you might have.

Dr. Raymond L. Orbach
Under Secretary for Science
U.S. Department of Energy

Mr. VISCLOSKY. Thank you very much.

And I would like to recognize Mr. Wamp.

Mr. WAMP. Thank you so very much.

I am in an unusual position—I want to welcome Dixon back into the room first—but I am in an unusual position, because this is the most important subcommittee in my world, but I am the ranking member of another very important subcommittee. And when our hearings start at 10:30, they can't start until I get there. So I really appreciate the courtesy of the chairman and other members to jump ahead here.

And I will be very brief, because I want to echo, Dr. Orbach, what former Chairman Hobson said about your service. I think it has been exemplary and very unique. And you have got a skill set that—you understand the science, and you understand this business, which is kind of hard to do sometimes. And I really appreciate your service.

The one thing I want to raise is this issue of ITER. I think most members don't realize that we are caught in a very awkward position; you are sitting in an awkward position. Because, right now, this really should be, in a fair and responsible world, it should be an issue for the supplemental that is coming to the Congress. But then there is a desire to keep the supplemental very clean.

Because, if we are going to honor our international commitments here, we need to go ahead with a supplemental request for ITER and not wait until 2009, where you have made this full request, because we are not honoring our agreements and our commitments on ITER.

So I hope that the person you work for—that is, the Commander in Chief of our country—will allow a special title for this particular international obligation to come with the supplemental.

FUSION ENERGY

Most people wonder what this means. How many universities in our country are involved in fusion energy?

Dr. ORBACH. I don't know the precise number, but it is very common in almost every university curriculum.

Mr. WAMP. And how many laboratories are involved in either fusion energy or partnered in the ITER project?

Dr. ORBACH. The majority of our laboratories are involved.

Mr. WAMP. And how many U.S. companies are likely to be involved in the construction of ITER?

Dr. ORBACH. We would hope a major U.S. presence for construction.

Mr. WAMP. I understand that just pending right in front of us is a couple hundred million dollars' worth of contracts of hardware, actual manufacturing-related U.S. jobs associated with ITER. This is not sending money overseas. This is like, if we don't honor these obligations, we effectively outsource these jobs overseas. And this is the good stuff; this is the high-tech, R&D-type work.

And the Congress and the administration need to come together on this. And I just want to make a case that this is a big deal.

And we are fortunate, in Oak Ridge, to handle some of the management of this program, because we have managed other major projects on time and on budget, and, as a result, the Office of

Science saw fit for us to handle some of the management of this fusion project.

And I just want to raise ITER and fusion energy as a major challenge and priority for the Congress, but the executive branch is going to have to do its part, not just send over a 2009 budget request. There are funding problems right now that need to be addressed between here and there. That is the big issue.

I don't want to put you on the spot, but I asked you a few minutes ago what your number-one priority for the coming year was, and what did you tell me, Dr. Orbach?

Dr. ORBACH. ITER.

Mr. WAMP. I yield back. [Laughter.]

OUT-YEAR ASSUMPTIONS FOR SCIENCE

Mr. VISCLOSKY. Thank you, Mr. Wamp.

Dr. Orbach, in fiscal year 2007, you asked for an increase of $500 million for the Office of Science, and you received an increase of $200 million. In 2008, your request included an increase of $600 million for the Science budget, and you received an increase of $220 million.

This year's request is for an increase of $750 million for Science. Given recent history, it would seem to be unwise to make operating decisions for the Office of Science assuming that the President's request will not be changed.

The Office of Science request represents a 19 percent increase in funding over fiscal year 2008 enacted levels. In your view, is a comparable increase in the level of research manpower sustainable over the long term, given current fiscal pressures?

Dr. ORBACH. Mr. Chairman, first of all, I do appreciate the committee's support in fiscal year 2007 and fiscal year 2008. And I acknowledge the incremental increases that the Office of Science received in a very difficult budget environment. And so, I want you to know that I am appreciative.

I also have the responsibility of looking at the health and welfare of our country from the scientific perspective. And it is my view that the American Competitiveness Initiative, the trajectory that the president laid out in 2006 and that Congress has supported through the America COMPETES Act, recognize the importance of basic research for the health of our economy.

Scientific research in the physical sciences underpins not only our scientific programs but also our manufacturing and our economy. The request looks large but, in fact, follows a trajectory that both Congress and the president and have laid out for an increase for basic research.

You ask whether we have planned for less. We are very hopeful that the president's request and the America COMPETES Act authorization levels will be possible in this fiscal year, fiscal year 2009.

We are planning for operations of all of our facilities at optimum levels. We are planning for a modest but significant increase in research support for universities across the country. We are planning very carefully for prioritized large-scale facilities. We are also planning for infrastructure improvements in our laboratories. And

when these are bundled together, the president's request is the number that we work toward.

We are prepared to work with the committee and to do the best we can with the resources that the budget will allow. But I do firmly believe that this increase, which looks large because of past history, is on the trajectory that both Congress, the president and industry, have recognized as essential for the economy and well-being of our country.

U.S. LEADERSHIP IN SCIENCE

Mr. VISCLOSKY. Doctor, some scientists, probably those in particle physics, raise the issue of U.S. leadership when advocating for increased federal support. Could you delineate for us what areas of research sponsored by your office do you believe the U.S. is clearly a world leader in and which ones are not?

Dr. ORBACH. As I have stated in the past, my commitment to this committee, to our scientific community and to our country is to be a world leader in everything we do.

And we don't do everything. When we prioritized our facilities, it was for the future. It was on the basis of scientific leadership. And where we have found that we are not leaders, we either ask ourselves, "Why not?", and try and fix it or we leave that for someone else.

If you will look across the Office of Science, from high energy physics to nuclear physics to fusion energy to condensed matter physics to basic energy sciences, biology—every one of those programs are world leaders.

I think we are recognized internationally for that. Ranking Member Hobson referred to scientific computation. It was this committee that enabled us to become the world leader. There is no issue, when it comes to the open science on high-end computers, the United States is very far in front of any other country.

More or less, what I plan in our budget is to give us a decade of leadership over any other competition. This is important not just for the science, but also for industry and for our economy. And so, we will not support work that is not world-class.

Mr. VISCLOSKY. I can understand doing work in a world-class fashion. We all try to do that in our lives. But are there not any areas where someone else has an advantage on us?

You mentioned a computational power, and I actually remember, some years ago—and it was under Mr. Hobson's leadership that the funding was provided—that Japan was at the time considered a leader.

Are there not any of these slices, given the world competition, if you would, in science that we have fallen behind in?

Dr. ORBACH. I am worried the advent of the large hadron collider at CERN will mean an offshoring of the highest-energy physics machine in the world. And we have, up to this time, always had that leadership, and so it is a new world for us. We are going to have to try to maintain leadership while recognizing that the best machine, after the Tevatron is finished, is in CERN, in Switzerland.

ITER is another example, that will be built in France.

What we are attempting to do, as these large-scale facilities are found—actually, built in Tennessee but assembled in France——

[Laughter.]

Dr. ORBACH. We will ship the material. But, actually, we will have scientists in France too, in Cadarache.

It is a new experience for us. We have always had the biggest machines here in the United States. And we would welcome people from around the world to come and use them. And their intellect and their contributions has added to our own and given us tremendous advantages.

Now we are in the position, at least in two of our fields, of having to go somewhere else in the near future for that leadership. And it is tricky. In high energy physics, the advisory committee is, as we speak, considering how to maintain U.S. leadership under a situation where the biggest machine is in CERN. And I think you will see a similar situation for the fusion energy community.

To be honest, Mr. Chairman, I don't want that to happen in other areas. And so—at the light sources, we are moving hopefully to keep that decade of leadership.

You are quite right, the Japanese did assume that leadership with the Earth simulator in 2002. And that was an area where we had lost it but we felt that we could not afford to. And so, that is what I meant when I said we then stepped in and, thanks to you and Congressman Hobson, we were able to regain that leadership.

So there are some areas that we really feel, even though we may be behind, we have got to catch up. And that is an example of how we have done it.

Mr. VISCLOSKY. Now, for the record, I would make a note that, with the growth in the world economy—look at the size of the European community, and you discussed some of the facilities in Europe—whether or not it is practical, despite our desire, to maintain that leadership across the board, and whether or not there are some particular areas over and above those you have enumerated now that we should be, as a committee, very concerned about, as far as that funding is allocated.

So, for the record, if there is anything else in some prepared questions we have, I would appreciate that.

U.S. MAINTAINS WORLD-CLASS SCIENTIFIC LEADERSHIP

Our goal is to be world leading or among the world leaders in every aspect of our portfolio investments—advanced computing, x-ray and neutron scattering, nuclear physics, and high-energy physics. While we prioritize our work and the funding of our facilities based on scientific leadership, all of our facilities are world leading, and we are recognized internationally in these scientific communities. Our triennial Committees of Visitors, other independent reviews, and reports such as those from the National Academies help us set direction and gauge success. The Office of Science prioritizes within its research programs, as well, in the accompanying areas based on opportunities for world leadership.

In some cases, strategic partnerships are required to enable the U.S. to be among the world leaders. For example, the U.S. has supported an international team in developing the Large Hadron Collider (LHC) at CERN in Geneva, Switzerland, which will become the world's highest-energy particle accelerator when it turns on later this year. In particular, the U.S. has been involved in the design and construction of both the LHC experiment detectors and the accelerator magnets.

The U.S. is also playing a key role in the ITER international partnership. ITER, to be sited in Cadarache, France will demonstrate the scientific and technological feasibility of fusion energy, the power source of the sun and the stars. The U.S. is one of seven partners in ITER, which collectively represents more than half the world's population. Such international partnerships are expected to become more

common in the future as "big science" incorporates more disciplines into increasingly larger-scale, more costly projects.

Our strategic planning for both facilities and research programs is focused on identifying and investing in those areas of research most essential for U.S. scientific leadership over the next decade.

Mr. Israel.

NATIONAL SYNCHROTRON LIGHT SOURCE

Mr. ISRAEL. Thank you, Mr. Chairman.

Dr. Orbach, let me echo what has been said. I have a very high regard for you and very deeply appreciate your leadership, appreciate your visits to Brookhaven National Lab with me, which is a very significant priority of mine. And we will miss you.

I appreciate the department's commitment to the NSLS, National Synchotron Light Source. You mentioned before that you are trying to make sure that we at least retain our leadership for a decade on light sources. And it seems to me that NSLS is critical to maintaining that leadership for at least a decade.

I am pleased, once again, to see the commitment for funding for this project in fiscal year 2009. Of the $103.3 million budgeted, $93 million is slated for construction. And my first question is, can you give us an update on exactly what is happening with NSLS, the construction and related issues?

Dr. ORBACH. Yes. It is coming along quite well. This was an example of a machine that we didn't think could be built this decade. And the scientists at Brookhaven figured it out and proved us wrong, wonderfully. And so we moved to regain that leadership.

Every country that is interested in biotech or pharmaceuticals or areas like that is building a light source. We are seeing Diamond built in England, which is a beautiful machine, just built for biology. And so the question is, how do we regain leadership? Just exactly the question Chairman Visclosky asked.

And in this case, we didn't want to cede it. We felt that it is so important for biology, for materials, for the economic benefit of our country, we had to be the best. And so we designed it.

We took a small hit in 2008. There was about a 30 percent reduction of the amount we had put in for PED. But we can fix that with the 2009 request. We now have a firm figure for the baseline for NSLS–II. And if we are allowed to follow the construction profile, of which the $103 million is a first step in that profile, we will build it on time, on budget.

So we are, so far, on track. The technical issues, which were very sophisticated when you get down to that level of resolution, have been dealt with. And we have done review after review that the laboratory has surpassed beautifully.

Mr. ISRAEL. If we were to slip on the budget for NSLS, what countries are poised to move ahead of us within the next decade? You mentioned England?

Dr. ORBACH. Well, yes, Diamond, which is just coming online, as I say, is an exquisite machine.

You know, if we slip on the funding of NSLS–II, we are going to build it. But it will get more expensive. Because once you slip, you have escalation and inflation that hurts you. But one way or an-

other, the Office of Science is going to build NSLS–II. I have said that even in periods of budgetary stringency.

This was, again, related to the question that the chairman asked me: Can you maintain leadership given difficult budgets? And so we are cherry-picking those areas that we feel are critical to our country.

The Linac Coherent Light Source at SLAC in California and the NSLS–II will give us leadership in chemistry, in biology, in materials, that no other country can match. We are just going to do it. I just hope we can do it on time, on budget, if we get the money.

CONTINUING RESOLUTION

Mr. ISRAEL. How do we do it if we have a C.R. for 6 months, let's say? What are your plans?

I appreciate and fully support what you are saying; you know that. But the assumption must be, unfortunately, that we are going to have, not a 3-month C.R., but we could have a 6-month C.R., maybe even longer.

So what contingencies are you and your budget folks developing in that eventually, for, say, a 6-month C.R.?

Dr. ORBACH. Well, we could keep the R&D going, and we would use what funds we have on the C.R. at the fiscal year 2008 level that we could use for construction. But it would ultimately end up with an increase in cost and a lengthening of the schedule.

I want to indicate, it sounds easy just to lengthen the schedule, but these are machines that our communities are depending on. The Northeast, as you are well aware, is a wonderful economic generator of jobs, and pharmaceuticals are especially strong. And the NSLS–II will give us the ability to see the proteins and cell walls one at a time. They have never been seen before, because they don't crystallize. So, just think of what that means for pharmaceuticals, for drugs and so on.

We are going to build it. And if it takes longer, it will mean that our industries then have to take longer to develop their products.

Mr. ISRAEL. This will be my final question. Have you been able to project the amount of increased cost——

Dr. ORBACH. Oh, yes.

Mr. ISRAEL [continuing]. Or the added schedule? Could you share that with the subcommittee?

Dr. ORBACH. I would prefer to do that for the record——

Mr. ISRAEL. Yes, sure. Thank you very much.

Thank you, Mr. Chairman.

NATIONAL SYNCHROTRON LIGHT SOURCE–II (NSLS–II) PROJECT

The National Synchrotron Light Source–II (NSLS–II) project is currently on schedule and within budget. In the event of an up-to-three month Continuing Resolution (CR) in FY 2009, no impacts on the project's cost and schedule are anticipated, assuming that the language of the CR allows spending to continue at the FY 2008 level.

A CR lasting into the second quarter would, however, delay key project activities and reduce the project's schedule contingency. The project's spending rate would be reduced to roughly half the planned rate and would necesitate delays in critical experimental facilities R&D activities, in completion of the initial linac design activities, and in site preparation activities. Such delays would substantially increase the risk of cost and schedule overruns on the project.

A CR lasting longer than six months would seriously delay the start of construction and would certainly delay the schedule and increase the cost of the project.

Mr. VISCLOSKY. Mr. Rehberg.

Mr. REHBERG. Thank you, Mr. Chairman.

And welcome to the committee.

Dr. ORBACH. Thank you.

CARBON CAPTURE AND SEQUESTRATION

Mr. REHBERG. I have already said hello to Dixon, so I don't have to do that again. [Laughter.]

I don't know if you are doing a good job, because this is my first hearing with you.

My question has to do with FutureGen and a change of direction within the Department of Energy. And it is hard to have a sense of urgency in energy projects or research that takes 10, 15, 20 years to see to fruition. But one of the concerns that I have is, any time you change directions within an agency that affects both the agency and the private partners, it creates a delay in the technology actually coming to a commercial schedule.

And so, can you give me assurances that the decision that was made by the DOE is not going to delay the science of sequestration and/or carbon capture?

And, especially as it relates to your budget, are there changes that are having to be made within your budget to adjust for a change in direction within the Department of Energy?

Dr. ORBACH. That is a very fine question, and thank you for raising it.

The reason I say that is that I believe that carbon capture and sequestration is critical to the future of coal and of other fossil fuels for energy production. And, therefore, given that coal-fired power plants amount to 50 percent of our electricity, it is a major issue.

We have joined with Fossil Energy in a collaborative program—and, in fact, it is in the budget—for carbon capture and storage. And that was unaffected by the decision of the department for FutureGen.

We are working with Fossil Energy not just for FutureGen but also for the partnership for carbon sequestration, where they have seven sites across the country. And if you look at the budget, you will see that we have added $5 million to our already-robust program in sequestration so that we can be there, on the site, with our researchers, doing basic research, while the sequestration projects are being pursued.

And we work very closely with Fossil Energy developing a plan to make sure that we know where the carbon is, we can measure it and we know where it is going when it is stored underground in saline aquifers. So we have maintained and expanded our commitment for carbon capture and sequestration.

FutureGen referred as well to the front end, namely to the so-called combined cycle gasification. And that is an area where, actually, our high-end computers have played a role. We have been able to optimize the gasifiers by using simulations on the high-end computers, working with metal and fossil energy.

So we are beginning to see the integration of the basic science with the applications. And I share your view; this is a critical area for our country and, indeed, for the world.

Mr. REHBERG. I inherited an earmark from Senator Burns. He got earmarks in zero emissions before I got to Congress, and, now that he is gone, I have carried that forward. And we have what is called the Center for Zero Emissions Research Technology or ZERT, at Montana State University.

$CO_2$ MONITORING

But I am not familiar with other universities or other programs that are either within the Department of Energy or are congressionally mandated from within the existing larger budget. Do you know of any other university projects or congressionally mandated earmarks that are working on some of the monitoring?

That is what Montana State's project is. They have the capacity to monitor leakage and such. And they are working on—it is well beyond me. I have been there, I have seen it, and I still couldn't explain it to you. But it is pretty interesting.

Could you tell me of any others?

Dr. ORBACH. I don't know expressly, but I would be glad to answer for the record. We could check through it.

But I will say that that particular issue of monitoring is critical. We need to know where that $CO_2$ is and what its behavior is. There is only a single example on Earth, off the coast of Norway, where such experiments are being conducted.

But for us in the United States, we have lots of saline aquifers into which we can pump $CO_2$. And so, for us, we have a different kind of substructure than Norway has. It is critical that we understand that.

Predicting $CO_2$ retention and detecting possible leakage from a target formation are essential for effective geological sequestration. Zero Emissions Research and Technology (ZERT) Center is a collaborative effort of Montana State University along with West Virginia University and several national laboratories (Los Alamos National Laboratory, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory, Pacific Northwest National Laboratory, and National Energy Technology Laboratory). The project focuses on basic science and development needs for improving our understanding of $CO_2$ behavior in the subsurface. The ZERT partnership has developed a distinctive field site for testing and verifying shallow subsurface (vadose zone) and surface monitoring techniques. These near-surface monitoring and verification experiments test and improve the ability to detect, locate, and quantify the movement of $CO_2$ to the surface.

DOE's Sequestration Program in the Office of Fossil Energy is supporting research to monitor the fate of carbon dioxide injected into deep geologic formations. Over 40 universities and academic institutions are involved in the geologic characterization and monitoring of carbon dioxide within the Regional Carbon Sequestration Partnerships' small- and large-scale field tests. These universities are working in the laboratory, on simulations, and in the field to determine the fate of $CO_2$, ranging from miles under the earth to the surface. These activities are being coordinated by DOE and the Regional Partnerships at over 30 field test sites, evaluating the most promising storage formations throughout the United States.

The universities or university-affiliated institutions involved in the Sequestration Program's research of deep geologic formations include:

Arizona State University
Boise State University
California Institute for Energy and Environment
California State University at Bakersfield
Colorado School of Mines
Colorado State University
Columbia University
Diné College
Energy and Environmental Research Center (University of North Dakota)
Idaho State University
Massachusetts Institute of Technology
Mississippi Sate University
Montana State University
Montana Tech
New Mexico Institute of Mining and Technology
New Mexico State University
New York State Museum (program operated by The University of the State of New York)

North Dakota State University
Norwegian University of Science and Technology
Ohio State Univerity
Oklahaoma State University
Oregon State University
South Dakota School of Mines and Technology
Stanford University
Texas A&M University
University of Alaska Fairbanks
University of Alberta
University of California Berkley
University of California Davis
University of Idaho
University of Maryland
University of Oklahoma
University of Utah
University of Wyoming (EOR Institute, GIS Center, and Environment and Natural Resources)
University of Montana
Utah State University
Virginia Center for Coal and Energy Research
Wageningen University (Netherlands)
West Virginia University
Western Michigan University
Washington State University

Mr. REHBERG. They are certainly doing something, then, unique that you are not doing within your budget somewhere?

Dr. ORBACH. I am afraid that I am not familiar in detail with what they are doing. But——

Mr. REHBERG. I would like to know that, as well.

I am one of those who can go either way on earmarks. I don't want it to be a duplication if something else is going on within the department. But then I also think, on the other side—and the members of the committee have heard me say—in some situations, when it has been authorized and appropriated and the president doesn't put it into his budget, makes us earmark, then the question becomes, why not?

I mean, if it is, as you say, so important to the future of coal development to have carbon capture and sequestration and the ability to monitor, why do I have to keep coming to my colleagues every year to ask for a $6 million appropriation to Montana State to do something that you ought to just automatically do and give the money to Montana State?

Dr. ORBACH. Well, first of all, Montana State is a fine academic institution. And I am very familiar, actually, with the physics department there, which is excellent.

If you will allow me, I would like to take a closer look at what is actually being done, and then I will return to you.

Mr. REHBERG. Great. Thank you.

Thanks, Mr. Chairman.

Mr. VISCLOSKY. Mr. Olver.

BIOENERGY RESEARCH COMPETITION

Mr. OLVER. Thank you, Mr. Chairman.

I apologize. I don't get to hear with the other subcommittee, the one that I chair. This happens to be one of those days when my other two subcommittees are meeting simultaneously, but not my own. So I can be here. And I am pleased—I don't get much of a chance to talk with Mr. Orbach.

You arrived in 2002 and served as director of the Office of Science, which was then elevated to an assistant secretariat, or deputy secretary—undersecretary for science in 2006. It seems to me that you have made quite an impact here. And the way you express what you are trying to accomplish, it seems to me very exemplary, and I am very impressed by that.

However, let me—I am actually very pleased with the additional money that is being requested in the budget here, though I am somewhat concerned that a fair amount of that must be coming because the budget for EERE over in renewable energy sources has been substantially reduced. So maybe it has all just been rearranged, and I don't understand what has been rearranged, so that some of that that legitimately maybe should not have been there has been moved.

Under your leadership, there was an initiative in 2007, three new bioenergy research centers were created, each center having to do with a national lab and a series of universities. I don't know much about that. I suppose you have something specifically about that that I could have, to know exactly what those three are. But

it has been said that they were named, at a point. They have been named, they have been established, those consortia, essentially.

What are the areas in which—this is biofuels, basically, cellulosic ethanol and biofuels. Is that one of the areas that you think we are approaching world leadership? Are we there, in your view?

Dr. ORBACH. Well, that is an area where I believe we are the world leader. And it is a very difficult area. It is one of tremendous importance for energy and for the balance of carbon dioxide upon combustion.

We have three centers—actually, one of them is at a university, University of Wisconsin, which is allied with Michigan State. The other two are headed at laboratories. The three of them are very complementary. And it was a competition——

Mr. OLVER. It was competed?

Dr. ORBACH. Oh, absolutely.

Mr. OLVER. For the three of them? The three of them are——

Dr. ORBACH. We had enough money——

Mr. OLVER [continuing]. Competition.

Dr. ORBACH. Yes. It was a very tight competition, very exciting one, actually. And the competition ended up with the three. And they are very complementary, just coming out of the competition. The university one, at Wisconsin and Michigan State, focuses on sustainability. Can you take biomass and produce enough——

Mr. OLVER. So, not only are they in competition, but they are also in communication and collaboration.

Dr. ORBACH. Very closely.

Mr. OLVER. Very closely. And you are organizing that, as well? Although, in the scientific community, it is all pretty open, through the processes of publication and review and so forth.

Dr. ORBACH. Absolutely.

Mr. OLVER. The word was that their research activities were going to begin in the fiscal 2008 budget. Has that actually occurred? Obviously, these places had already been doing basic research that they had put together in different ways. But any new impetus from that would have started in 2008?

Dr. ORBACH. It actually began in 2007.

Mr. OLVER. Began in 2007.

Dr. ORBACH. We were able to take funds and, through Congress's approval, provide $30 million at the end of fiscal year 2007 to give each of those three bioenergy centers $10 million to start up. They are all under way now.

ENERGY FRONTIER RESEARCH CENTERS

Mr. OLVER. Okay. Now, all right, so that one is one where we have, actually, leadership, world leadership.

You have the other program that you mentioned earlier today of $100 million a year, to go out in $2 million to $5 million sums, which sounds likely to be anywhere from 20 to 50 such places. That sounds like a much more shotgun arrangement. I imagine they are going to be competed in some kind of a manner. I would be very curious about how that is going to go.

And what are the areas in which that is going to function?

Dr. ORBACH. Well, what we want to do—it will be competed in what we call a "funding opportunity announcement," which means it is wide open but it will be peer-reviewed.

Mr. OLVER. Is it one institution each, one of those $2 million to $5 million goes to one institution?

Dr. ORBACH. That is correct.

Mr. OLVER. And over what areas of science are those going to be focusing?

Dr. ORBACH. Well, we have given eight or nine suggestions.

Mr. OLVER. I see.

Dr. ORBACH. But, in fact, what we want to do is to really explore the frontiers. And so, we are going to allow groups to come together—we call it self-assembly—and tell us what areas of energy research they would like to address. We have given some examples.

Mr. OLVER. Okay, you have given them nine examples. But these, then, are ones where you think, from your range of scientific advisors and so forth, that there are opportunities in the future, rather than where we have identified something where we have world leadership or are trying to maintain world leadership. Would that be fair to say?

Dr. ORBACH. That is a very accurate description. We have had over a dozen workshops since 2002 trying to identify the opportunities for energy production.

Mr. OLVER. Have you provided the committee with the background and the format for how this is to function, how this is to be done?

Dr. ORBACH. We have discussed it with the staff on the committee. I would be pleased to provide all of the information. Also, all of these workshops are on our Web site, and the description of the Energy Frontier Research Centers is also on our Web site.

ENERGY FRONTIER RESEARCH CENTERS

The Energy Frontier Research Centers (EFRCs) are a means to attract the very best American scientists and engineers to address our country's energy needs. EFRC awards are expected to be in the $2 to $5 million range annually for a five year period. The magnitude of the funding and the five year minimum commitment will enable "self assembly" of our finest minds to address current fundamental roadblocks to U.S. energy security. The EFRCs will address energy and science "grand challenges" in a broad range of research areas, defined through a series of workshops conducted over the past five years. EFRC proposals will be solicited in an open competition among all researchers for the very best ideas to address the fundamental questions of how nature works and to help solve some of our most critical real-world challenges. Universities, DOE national laboratories, the private sector, or partnerships among these groups are eligible to apply. The selection of the initial 20 to 30 awards in FY 2009 will depend on the quality of the proposals received as determined by peer review.

There are two main criteria for research in the Energy Frontier Research Centers: the research must lie at the forefront of one of the science grand challenges described in the Basic Energy Sciences Advisory Committee (BESAC) report Directing Matter and Energy: Five Challenges for Science and the Imagination, and it must address one or more of the energy research challenges described in the ten Office of Science/Basic Energy Sciences workshop reports on Basic Research Needs series. These are: Advanced Nuclear Energy Systems, Catalysis for Energy, Clean and Efficient Combustion of 21st Century Transportation Fuels, Electrical Energy Storage, Geosciences: Facilitating 21st Century Energy Systems, The Hydrogen Economy, Materials under Extreme Environments, Solar Energy Utilization, Solid-State Lighting, and Superconductivity. All of these workshop reports are available on the Internet at *http://www.sc.doe.gov/bes/reports/list.html.*

Mr. OLVER. Well, I think it is great to actually be looking for things which we are not quite sure of. But that means you lay them out there, and if you put out 20 or 30 of these, whatever the number is that you happen to finally put out, you may get one or two that are actually the places that are going to go for major breakthroughs, and some of them are going to float along, and some of them are going to end up not producing much of anything, would be my guess. That is usually the way that research functions.

Dr. ORBACH. We hope they will all be successful, but you are also correct in your final analysis.

The basic research that will be done in all of these centers will be critical. Which ones transform, which ones are transformational in how we actually produce energy in our country remains to be seen.

But things like electrical energy storage, for example, which is critical if we are ever going to have baseload from intermittent sources; issues of biofuels, as we have already talked about—all of those are open.

And what we want to do is—there is so much enthusiasm in the research community to contribute to the energy problems facing it. These are human beings that pay the same price for gas that you do; they are concerned about it. And what we want to do is give them the opportunity to come together and create ideas and processes that will give us an advantage in the energy field.

Mr. OLVER. Thank you, Mr. Chairman. I am just preparing myself for the next round.

Mr. VISCLOSKY. Mr. Calvert.

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Mr. CALVERT. Thank you, Mr. Chairman.

And I am very pleased to be here today with Dr. Orbach. I have known the doctor for many years. He was the chancellor at the University of California-Riverside, which is in my congressional district, and has a great reputation in California, as well as here in Washington, D.C.

And welcome, Doctor. It is good to see you again.

And let's talk about ITER a little bit. Obviously, I have been very supportive of ITER for some time now. And I think that fusion is something that I guess some people describe as a silver bullet. If we could ever move in the direction in which we can prove that fusion is a viable energy source for the future of this country, then basically many of our energy problems are behind us.

And I would like to give you the opportunity to describe why progress on fusion research in this country is so dependent on our participation in this project, ITER.

Dr. ORBACH. Thank you, Congressman Calvert. And thank you for the compliment. I have enjoyed working with you; I look forward to continuing.

The issue for the world is energy in forms of production that are environmentally benign. And there is no other source that I know of that is capable of the magnitude of energy production without any impact on the environment besides fusion. It is the way the

sun works. It is the way the stars are fired. It is an opportunity for us to try to create on Earth that environment.

The difficulty is that the interior of stars exceed any kind of temperature that we have ever controlled on Earth before. And so, we now believe that magnetic confinement can work. It is a high risk, and I won't promise that it will work. But if it does, we want to be part of it, because the consequences for us and the world will be immense.

We have done very rough estimates that indicate that something like half of the extra energy that the world needs under a carbon limit could be produced by fusion by the end of this century. That is a huge amount of energy. And it is because the only thing that you need is deuterium from sea water and lithium, which is one of the most abundant elements on Earth.

So you are starting with elements that are abundant, and what you end up with is energy and helium gas. You don't like helium gas—it leaves the Earth because gravity is not strong enough to keep it. I just don't know of another source capable of that amount of energy which is clean. And so we are doing everything we can.

If we are not a part of ITER and it works, just think about the United States 30 years, 40 years from now, and the position we would be in. In my view, it is absolutely critical that we play a major role.

And our computational simulations, our experiments at MIT, at Princeton, at General Atomics, are the best in the world. The ITER design, the D-shaped design, is a consequence of our work at General Atomics.

So we have a huge stake in this. And it has been tough for us, but we are going to persevere. I have worked very hard to keep the project office alive in Tennessee, at Oak Ridge, because it is a wonderful group of people. It has attracted the very best people in our country, for all the reasons that I just outlined.

U.S. PARTICIPATION IN ITER PROGRAM

Mr. CALVERT. Just from a business point of view, since I came out of the business community, we have made a deal, we have made a deal with a number of international partners to go into a very risky endeavor. Obviously, these partners understand that risk, these countries, and they are putting money up.

And what would happen to us as a country, the United States, if we failed to participate, if we failed to meet our obligation within this agreement, with international partnerships in the future or deals that are going on this very day here in the United States?

Dr. ORBACH. Well, we have already lost some credibility, and we would lose all. Half the world's population is involved in building ITER, and I was criticized over and over again during the negotiations because, "We couldn't trust the Americans to stay with us."

I pushed back. I said we are as good as our word. We ended up signing it in November of 2006. It is now ratified and in place.

It would be tragic for our collaboration on an international scale, which I believe is essential for future large-scale scientific experiments. But also, I think we have a huge stake, here in our country, for our own self-interest in this program.

Mr. CALVERT. Thank you, Doctor.

Thank you.

Mr. VISCLOSKY. Thank you very much.

And I am going to recognize Mr. Pastor in just one moment. I just would also want to make the observation that it seems as though you have just an incredibly unfair advantage before this subcommittee, between Mr. Calvert, the fact that the new president of Purdue also held the position you did at U.C.-Riverside. In fact, Shari Davenport is from Riverside. It just seems as though this is not a fair fight, at this point.

I will now recognize Mr. Pastor.

BIOFUELS RESEARCH

Mr. PASTOR. Thank you, Mr. Chairman.

Good morning.

In your testimony, you talked about the biofuels, and you talk about the limitations and drawbacks of corn- and sugar-based biofuels. And I am sure you are aware, in various states, including in Arizona, I know that they are doing more research on algae as a possible feedstock for the biofuel.

Are you familiar with any of that research that is going on?

Dr. ORBACH. Yes, I am.

Mr. PASTOR. What various places are you aware of it?

Dr. ORBACH. Well, the research on algae, which is very promising, is focused on both fuels, and in particular fuels like Jp–8—is that the right one?—the jet fuel, but it is also possible to generate hydrogen from algae.

And different parts of our government are supporting different aspects of the research. DARPA has just issued an announcement, competition, for jet fuel.

We are looking at the hydrogen production; that is, can you actually treat algae by working with microbial genomics to produce hydrogen? It already does produce hydrogen, but can you actually make that commercial?

Mr. PASTOR. Commercial.

Dr. ORBACH. So, between the different programs in DOE and across the government agencies, we collaborate, we talk to one another. There is tremendous interest in algae.

Mr. PASTOR. In the omnibus bill that we passed, we have, as part of the omnibus bill, "The department is directed to include algae as a potential feedstock in its biomass research and development." So is it something you agree with or disagree with or——

Dr. ORBACH. Oh, yes, absolutely, and we thank you for that.

Mr. PASTOR. And, I guess, the real crux of the questioning is going to get to, how do you feel about earmarks? [Laughter.]

You heard about Montana State and the work they are doing. Do you think that it is something that is binding on your office, or is it advisory, or is it something you can look at and ignore?

Dr. ORBACH. No, we don't ignore—we follow congressional direction. And we have always, in my experience, done that. And we intend to continue.

SCIENCE AND ENERGY STORAGE

Mr. PASTOR. Oh, thank you. Because, I don't know, several weeks ago, we have the Secretary of Energy that probably was on the op-

posite side of your position, it seemed to me anyway. But I am glad to hear that you follow the mandated or at least the directed programs that Congress advises you to do.

Also, in your testimony, and you talk about it, is increasing the capacity of storing energy. And we had a panel about 2 weeks ago, and I came away with the impression that you can do the biofuel, you can do the hydrogen fuel cell, and you can do solar, et cetera, but if you don't have the capacity to store them, that seems to be the bottleneck in making it commercially profitable, without the capacity to store it.

And from that testimony, the impression is that we have the chemistry scientists, the people who understand it, but we are behind Korea and, I think, Japan and other countries because of the lack of manufacturing capacity. And as we force our auto industry to go into hydrogen fuel cells and other types of fuel, it seems like we are going to lag in the ability to design and manufacture the capacity to store that energy.

And I think I read in your testimony where that is an area that you are very much interested in getting involved in.

Dr. ORBACH. I think we are doing pretty well. The battery that plug-in hybrids need is one of our targets. The lithium ion battery, which most of the automobile manufacturers now are looking toward for plug-in hybrids, has been on our radar screen for quite a while.

In fact, the A–123 battery, which GM is using—actually, they had a car sitting out here last year, a little black car—that battery uses a phosphate electrode that was the result of one of our basic research programs.

So we are committed to electrical energy storage for all the reasons you said. We would like to go beyond what we have now. And so, we are also focusing on what we call transformational ways of storing electricity.

This takes us back 200 years. Batteries have single electron transfer. They haven't changed, literally, in centuries. But nature uses two electron transfer for photosynthesis. Is there any way that we can get multi-electron transfer in a battery? You can just see how that would increase the capacity of the battery.

And, finally, we now have, through nanotechnology, developed what we call supercapacitors. When I built radios a long time ago, we were talking about microfarads for a measure. We now have capacitors of the same size that can store farads.

Now, the problem is that there is a materials issue. If we can solve that materials issue, we may well use capacitors instead of batteries for storage of electricity.

So there are all kinds of ideas out there that we are working with and investing in to see which one would be most effective to go beyond what we are doing now.

Mr. PASTOR. How are you investing in some of those ideas?

Mr. ORBACH. Through basic research grants. We do that directly.

I mentioned the Energy Frontier Research Centers before, with Congressman Olver, and that is another way that we hope we can get people engaged.

But we are doing it through peer-reviewed basic research.

Mr. PASTOR. I thank you.

I thank the chairman.

Mr. VISCLOSKY. Thank you very much.

Mr. Simpson.

U.S. INVOLVEMENT IN INTERNATIONAL RESEARCH

Mr. SIMPSON. Thank you, Mr. Chairman.

We are all sitting over here kind of giggling because I certainly have always wondered, too, about electron transfers and whether——

[Laughter.]

Mr. SIMPSON. Representative Emerson asked me about microfarad, and I said it is a very small farad. [Laughter.]

So here we are asking you about sciences, which at least I don't understand most of it. I know what an electron is, but——

[Laughter.]

Mr. SIMPSON. I went to an accredited college. [Laughter.]

You said earlier, when you were talking to Representative Calvert, that you dealt with people from other countries that said you couldn't trust the Americans to stay with us. Do you find that a lot?

Dr. ORBACH. To be honest, yes.

Mr. SIMPSON. What do you think the genesis of that is?

Dr. ORBACH. In the science area, it has been a history of projects where we have been involved with foreign collaborators and then pulled out—the Superconducting Super Collider; we just did it again when we had to shut down BaBar at SLAC early; we have done it—I would prefer not to go through all of them in open session.

Mr. SIMPSON. Well, what do you think the cause is of that phenomenon?

Because that has been a concern, I think, of members of this committee, that, within the Department of Energy, we start down a path, then we change paths, and we are always going in different directions, and it seems like we never see anything through to completion. And so, consequently, we get very reluctant to be funding big, long-term projects, because we are never sure that that project is going to see a completion date ever.

Is it the political process that we have here that changes directions? Is it the fact that, you know, we change administrations so rapidly that priorities change? Is it that we don't select our investments, or where we ought to be investing, put enough thought into it beforehand? What do you think the phenomenon is that causes that?

Dr. ORBACH. That is a very difficult question to answer, and I am not too sure I know the answer.

I do know that we have been involved in projects where we have not thought through the cost of construction carefully enough. It is difficult, sometimes, because they are the first time they have been done.

I will say that, in my 5 years, we have stopped projects, hopefully before they began construction. But we did it because we felt that either the cost was too high or the timing was such that it made no sense to build it.

There was something called BTeV, which was in our 20-year facilities outlook, and we decided to abandon it. And that was because, by the time we would build it, there would be competition and we would not be a world leader.

We took RIA, the Rare Isotope Accelerator, and we cut that cost in half, because we found the Germans were going to invest very strongly in this area, and we thought we could do what we needed to do with less money.

So it is a complex set of reasons.

The reason it is important to maintain commitments when you have foreign involvement is that the involvement is not just user involvement. At BaBar, for example, the Italian government had invested in the experiment itself; they were actually the spokesmen of the experiment.

We profit enormously when other countries invest in us. And that is what I am worried about, is that the lack of continuity and commitment will discourage that investment. It is not dissimilar from other investments in our country, but I am focusing on the scientific side.

We have done everything we can, within the Office of Science, to maintain commitments. And, for example, for ITER, we are going to keep that project office alive, one way or the other. And it is just so important that we are going to do it. And we are going to use the resources we have to do it.

PRIVATE INDUSTRY INVESTMENT

Mr. SIMPSON. You talk about foreign country investment and so forth. What about private industry investment?

We are trying to make more of our facilities user-friendly and hopefully recover costs from users of our facilities; is that right?

Dr. ORBACH. Well, it depends on how the facilities are being used. If it is for open science, we don't charge. We treat industry the same way we treat the university researchers.

For example, on our computers, we have 17 companies that are using our leadership class facility. And as long as they agree to publish their results in the open literature, there is no charge. It is the same as for anybody else. On the other hand, they profit from that research.

If they use it for proprietary purposes, then that is another matter. Then they pay for the cost of operations.

Mr. SIMPSON. Do they pay the full cost of operations?

Dr. ORBACH. They certainly do, and we have that audited.

WORK FOR OTHERS

Mr. SIMPSON. Let me ask you a series of questions here. Your laboratories aggressively pursue and perform millions of dollars of work for other agencies every year, a practice known as, not surprisingly, "Work for Others."

We are all rightly proud of the expertise that our science facilities have developed, and we want to make sure that that expertise is available to the rest of the community when it doesn't detract from our core science mission.

We are concerned about whether the DOE bears a fair share of the cost for the expansion of lab capacities needed to perform work

for other customers. Are any of the funds that we appropriated to the labs to support DOE missions being used by the labs to market their services to other agencies or to lobby Congress for increased funding?

Dr. ORBACH. I hope not. The funds that you provide to the laboratories are for the purposes you have indicated and that we are pursuing. The work for others is supposed to pay its own way.

There is an issue of investment in the laboratory infrastructure. And there, we use the overhead charge for Work for Others for laboratory renewal. We call that the LDRD funding.

Whether that is sufficient or not is an interesting question, and I don't know the answer. But we do try to develop our laboratory capabilities that others then use in Work for Others through that overhead charge.

Mr. SIMPSON. When the laboratory accepts work for others, does it only do so when it has spare space and workforce? If not, do you ask the committee for additional up-front funding for additional facilities and to hire new workers?

Dr. ORBACH. No, we do not. And, yes, it must be something that the laboratory can do and not interfere with its core mission.

Mr. SIMPSON. Do the laboratory contracts impose any sort of ceiling on how many personnel each lab may employ?

Dr. ORBACH. Not that I know of.

Mr. SIMPSON. While I could understand why an individual laboratory may want to grow in the future, is it in the best interests of the department or the taxpayers to see these labs grow?

Dr. ORBACH. My belief is yes,—first of all, many of the others are federal agencies. And, in addition, I think they provide a service for our country. They are very, very sophisticated, and I think there is work that can only be done at the laboratories. But, as you said at the very beginning, the sine qua non is that their purpose fulfills the Department of Energy's mission.

Mr. SIMPSON. If the laboratory increases its staff to support work for other customers and then those staff are no longer needed, is DOE responsible for all of the severance costs associated with those employees?

Dr. ORBACH. I am sorry, I do not know the answer to that. If I could respond for the record, I would appreciate it.

WORK FOR OTHERS

When performing work for other Federal agencies, the Department is required to recover the full cost of that work. That full cost includes an overhead or indirect component that covers employee benefits, including severance costs. So, the cost of severance for laboratory employees is covered by all funding sponsors of the laboratory and not just DOE.

Mr. SIMPSON. I appreciate it. Thank you.

Thanks, Mr. Chairman.

Mr. VISCLOSKY. Thank you very much.

Mr. Berry.

Mr. BERRY. Thank you, Mr. Chairman.

Dr. Orbach, I am afraid we have just demonstrated to the entire world the need for more scientific education, particularly this committee. [Laughter.]

We appreciate your patience, and we certainly appreciate your straightforwardness in the way that you conduct this office.

Dr. ORBACH. Thank you.

CONGRESSIONAL DIRECTION

Mr. BERRY. I am almost afraid to try to ask you a question. [Laughter.]

Because Simpson is going to try to make it look like I am from Arkansas and I talk slow. [Laughter.]

When Mr. Hobson was the chairman of this committee—he is now the ranking member—he came to Arkansas and visited a water project that we were working on. And a reporter came up to him and said, "I understand that if you do this project, once it is completed it will still take 200 years to correct the problem that we are building this project to correct." And Mr. Hobson's response to the reporter was, "Well, if it is going to take 200 years, we had better get started." [Laughter.]

I thought that was a pretty good answer.

From what you have said this morning, I get the impression that maybe the Congress doesn't appreciate the urgency of these matters at times, that we are not proceeding—I know, during World War II and the Cold War, we put just about any amount of money that we needed to put in to develop the nuclear weapons that we used during World War II and to develop rockets and all of the war machines that we have built.

And I get the sense that the matter is just as urgent today. It may just be a little bit different characterization. Instead of building a war machine, we are building an energy machine, for lack of a better way to describe it.

Are we acting, as a Congress, as urgently and as in timely a manner as we need to be?

I am not trying to get you to ask for something that you are not supposed to ask for. But I feel like we are not investing in these matters as much as we should be.

Dr. ORBACH. Mr. Congressman, first of all, I think you do understand completely what the issues are. And I am grateful to this committee for its support. The fiscal year 2008, as the chairman indicated, fiscal year 2008 omnibus funded fully our program for our bioenergy research centers. The biology and environmental research program was actually given more than the president requested, and I believe that is because the committee felt strongly in its mission. And we appreciate that very much.

The magnitude of the problem that you described is something that I don't think our country has ever dealt with before. I just think we have had an atmosphere that somehow energy is available, it is plentiful, it is cheap, we don't have to worry about it. And so, frankly, we are now struggling with something that, frankly, I don't think any of us were prepared to deal with.

My belief is it is the most serious problem that our country will ever face. Because, without energy, our economy will collapse.

The trouble is that we have an environmental issue on top of everything else. And so what we are struggling to do is to come up with changes in the way we go about producing energy that will be both energy-productive and environmentally benign.

And it is my personal belief that our current technology is not capable. This means that we have got to invest in the future. And

so I am doing everything I can within our budgetary limits to do so.

I do think Congress understands this. I think that you have been supportive. And, as I said before, we are appreciative.

The scale of the problem is something that is quite staggering. My own belief is that we need a continuum of opportunities. We need something in what I will call the short near term, the next 2 to 3 years, that we can rely on. And there are bioenergy research centers. They are one of our main hopes.

But we also have to plan for the long term. And there, ITER is the long term. And we have things along the way that we hope will materialize. Electrical energy storage that Congressman Pastor was referring to, that is not going to happen, I don't believe—I hope it will, but I don't think it will happen quickly. But we need to make the investment so that it can happen.

So what we have tried to do in our budget is to look at a continuum, 2 or 3 years from now and on out till, say, 35, 40 years, at energy production that is environmentally benign. I can't promise you that we will be successful, but I can say that if we don't try it, then we are going to pay a heavy price.

Mr. BERRY. Thank you, sir.

Mr. VISCLOSKY. Thank you, Mr. Berry.

Doctor, what I am going to do is recognize Ms. Emerson for a line of questions. We have two votes, so it will be our intent to leave toward the end of the first and come back to continue, if that would be okay.

And before members leave too, I also just want to suggest that—I want to thank you and all the members.

I want to thank you very much for Uday Varadarajan, who is a detailee from your office. And while Mr. Berry would feign ignorance, Uday has done a terrific job in describing things like inertial confinement and its distinction between magnetic confinement. The problem I have, at 58, is retaining any of that information. [Laughter.]

But now I would recognize Mrs. Emerson.

RENEWABLE FUEL STANDARDS

Mrs. EMERSON. Thanks so much for being here, Dr. Orbach. We do love having you. And you are the most articulate physicist I have ever met. [Laughter.]

And my uncle was one, so, actually, I have a tiny bit of experience. But you, sort of, make the science come to life, and it is a great gift. And so we thank you for all you do.

Just because we have a constrained time limit, let me ask you one question on each of the subjects I wanted to ask you about. And I apologize, since I was late; I was in another committee.

On the renewable fuel standard, obviously you are aware of the energy bill that the Congress recently passed and the president signed that calls for us to meet a 36–billion-gallon renewable fuel standard goal by 2022. I think that is, from what I can tell, kind of a steep hill to climb.

But anyway, if you could elaborate a little bit on both the challenges we face and the strategies that are being developed to comply with this renewable fuel standard, I would be grateful.

Dr. ORBACH. Well, it is a steep hill. I think you understand perfectly.

I used to think that cellulosic ethanol from corn would be—pardon me—corn-based ethanol, the sugars from corn, would be limited to about 17 billion gallons, just on the basis of how much you could produce. I have been told by our farming community, no way, they could hit 30 billion gallons. And so——

Mrs. EMERSON. I don't think——

Dr. ORBACH. Well——

Mrs. EMERSON. I mean, we would have to plow up an awful lot of land. I think that is a little bit steep. And, believe me, I have a total agriculture district, so I will do anything the farmers say. I think that is a little bit high, though. Anyway, go ahead.

Dr. ORBACH. I would never argue with either you or the farmers.

Mrs. EMERSON. I don't argue with my farmers either.

Dr. ORBACH. But nevertheless there are problems, in terms of—it is exactly as you said—farm land. The cost of grain now is going through the roof. There is also the issue of carbon, because of the fertilizers and other products that are necessary for farming.

So my belief is that we will get to the 36 billion, but the pathway will be through cellulosic ethanol and cellulosic fuels.

I want to make clear that it is not just ethanol; that we are, in fact, at our bioenergy centers now looking at things like gasoline and diesel fuel from biomass. And it is not only feasible, I think that it is real. And you will be hearing more within the next couple of years, as we begin to learn how to add these additional carbons to the fuel.

It won't only be from fermentation. We are seeing some initial signs of really quite remarkable success from other ways of converting the sugars to fuel. They involve catalysis, with remarkable new catalytic structures.

I think there are some real surprises ahead. The next couple of years are going to be very exciting for fuel from biomass. We have enough biomass—our studies with USDA—and you and I have spoken about this—to replace roughly 30 percent of our fuels. The 36 billion represents something like 15 percent of what our fuel consumption would be in 2022. We have got more there. And I believe this is an investment well worth our interest and attention.

Mrs. EMERSON. You know, we actually have a—there is a company that is doing some experimental work in my hometown of Cape Girardeau that is actually taking biomass and converting it into gasoline. And it is, you know, kind of interesting. So, anyway, I appreciate that answer.

CAFE STANDARDS

Let me ask you one other question real quick, with regard to CAFE standards. You mention them in your written testimony. And is the Office of Science coordinating you all's research and development efforts with the auto manufacturers? Or is that happening somewhere else in DOE?

Dr. ORBACH. It is happening all across DOE. Our interface with the automobile manufacturers is at the basic research level. They have excellent researchers. And we are in close contact with them, and, in fact, they use our facilities.

And we are, for example, very much involved in the plug-in hybrid battery issue. I mentioned the lithium ion battery. And the fuel cell issue, we are involved with them. For hydrogen propulsion, hydrogen storage, we are working with them.

Mrs. EMERSON. This is a silly question, but do you all include consumer preferences or tendencies when you—you know, are those taken into account at all when you are developing vehicle technologies? I am just curious.

Dr. ORBACH. It is a very interesting question. We technically don't understand how to do that.

However, the noise issue for cars is something that I, as a consumer, and you also care about. And so we are working with General Motors to design the airfoil properties of cars to reduce noise. Toyota has done that. That is why some of the Japanese cars are quieter.

That is a consumer issue. It is also, actually, an energy issue. But we are actually using our computational facilities for that, but I am afraid that is not one of our great expertise areas.

Mrs. EMERSON. Just wondering. Just wondering.

I better stop there. I think we only have 4 minutes—3. Thank you so much.

Mr. VISCLOSKY. Doctor, we will return in a few minutes.

Dr. ORBACH. Thank you.

[Recess.]

ENERGY FRONTIER RESEARCH CENTERS

Mr. VISCLOSKY. We will go back into session.

Dr. Orbach, you have had a number of interchanges, particularly with Mr. Olver, on the Energy Frontier Research Centers in the Office of Basic Energy Sciences, and had a discussion generally about the proposal as well as the $100 million request.

The question I would have is, much of this funding is intended to support research envisioned for these centers. What is the value added by the centers themselves?

And also, is the funding for research, or is it for buildings and facilities to do research in? Because when you think of centers, you think of some physical place and structure. Is this for research at existing centers? Is this to build, from a construction standpoint, centers? How will the monies be used?

Because while $2 million to $5 million on one level is a lot of money, in this scenario it is not a great deal of money.

Dr. ORBACH. It would not be used for buildings. It would not be used for capital equipment. It would be used for research. There may well be research equipment that would be required, but it is meant for people.

And it would be used for groups, because we believe that there is an intermediate between the individual project grant and something as big as a laboratory that we have not explored before for this purpose.

And so we would hope that maybe half a dozen researchers would get together, say, at a university, and we would be interested in pursuing some of the aspects that would be helpful for energy purposes for our country—and would self-assemble and would create something that six individuals separately could not do and

they would work together. You might have people from different parts of a discipline who would work together collaboratively.

So it is meant to, sort of, fill in the middle between the individual project grant and these very large laboratories. And it would, we believe, bring into the energy sphere individuals who are very, very fine, who want to contribute but who have not been given the opportunity to do so.

The $2 million to $5 million would be exclusively for research and would be committed over a 5-year period. There are no matching requirements. There is nothing else associated with it. It is focused on energy.

And there would be reviews. But, after 5 years, if they were successful, the intention would be to renew.

Mr. VISCLOSKY. Would private-sector entities also be able to compete?

Dr. ORBACH. Yes.

Mr. VISCLOSKY. Okay. What is your plan in the out-years, for 2010, 2011, 2012? Will there be a commensurate request? Will there be follow-on monies on an annual basis then for this first 5-year period, or will there be additional competition for other centers, if you would?

Dr. ORBACH. The answer is yes.

What we are doing is working under the trajectory of the America COMPETES Act or the American Competitiveness Initiative. Both of them essentially track each other.

And what we would do—the $100 million would be there for 5 years in our budget. We would take a look after——

Mr. VISCLOSKY. So it all would not be expended in 2009?

Dr. ORBACH. It would all be expended in 2009.

Mr. VISCLOSKY. Okay.

Dr. ORBACH. Because it is $100 million in the first year, another $100 million in the second and so on. It is permanent.

Mr. VISCLOSKY. Okay, okay, I got you.

Dr. ORBACH. But what we would do is we would take a look, after a couple of years—we anticipate this is going to be very successful, but we will take a look, and if it is successful and if the trajectory that I just described can happen, then we would probably have a second round of competition, and continuing the first, so that we would add more of these groups to our energy issues.

It is hard to imagine 6 years out, but in some steady state I would like to see on the order of a hundred of these around the country. But we have to get there. And I can't promise that the trajectories will allow us to do it.

But we will keep the 20 to 30 funded at $100 million per year for 5 years. That is built into our base budget.

Mr. VISCLOSKY. Although I assume, with your annual review, if something is not being productive or someone takes a hard turn in the road, there is no guarantee in the out-years.

Dr. ORBACH. That is correct.

Mr. VISCLOSKY. Okay.

The committee and I, for one—and, again, I think I speak for the committee—really appreciate this initiative. It is an initiative of the office that strongly spurs competition, opening it up to additional entities. And we appreciate that.

We do endorse the open, competitive model being proposed for the centers, which feature head-to-head competition between national labs and universities to ensure the best proposals.

A concern I do have is for smaller universities and entities that still, nevertheless, given some of the larger institutions in this country, may be at a disadvantage in competing for these centers. How do you plan to address that issue in the competition?

Dr. ORBACH. Well, I happen to be from one of those small universities. And that is why the small group, say, half a dozen, is so important.

Small universities can be very strong in specific areas. A small institution cannot cover all the areas, but most universities of quality will focus on some area that they are strong in.

And I think the small institutions are going to do just fine, because we are not talking about the whole campus. And we hope they will seize upon this. We are trying to make it well-known. I spoke before an executive board, a very large cross-section of institutions from across the country, acquainting them with this opportunity.

I think the small institutions may do just fine.

APPLIED RESEARCH FUNDING

Mr. VISCLOSKY. Dr. Orbach, your request for the office does call for a significant increase. Other areas in the DOE's budget, as I mentioned in my opening statement, see reductions for energy technology programs, with the exception of the nuclear sector.

And with oil around $100 a barrel, you have mentioned, yourself, the issue of climate change and needing the best analysis, as far as a broad portfolio of energy options; and your tasking to advise the Secretary of Energy on scientific issues relative to all mission objectives, do you believe that the energy technology offices have adequate funding for applied science research in this budget, to make use of the scientific results of the basic research?

Dr. ORBACH. Mr. Chairman, I do. We work very closely with the applied programs—with Energy Efficiency and Renewable Energy. I mentioned Fossil Energy before. We also work with Nuclear Energy. We work across the board with the applied programs.

And what we try to do is to maintain the integrity of both, so that the basic research and the applied research maintain their identity, because that is, after all, what those programs are good at.

But we coordinate at the interface. And in our budget, for the first time, you will see six examples of that coordination. And we have worked, over this past year, very closely.

We sent to Congress, in the summer of 2006, 21 areas that we thought were ripe for collaborative research. And then, this year, over the years, we have worked to develop these relationships.

The Office of Science will put about, I think it is, $115 million of the 2009 budget into these coordinated research relationships. And it is something like $400 million, when you take the applied program contributions into account—roughly a two-to-one.

And the purpose of this is to help one another; to have the basic research in form be applied, but also we learn from the applica-

tions. It is a feed to the basic research area which has proven to be very effective.

So it is a true coordination. And I gave the example of carbon sequestration, where we would literally have our research scientists on the site of the partnerships. But there are other examples in electrical energy storage and others that are in the budget.

Mr. VISCLOSKY. And I would want to commend you for your efforts to integrate that R&D. That certainly is our impression.

But it would, then, be your belief that the budget provides sufficient funding for long-term applied science?

Dr. ORBACH. I would say so, yes, sir.

Mr. VISCLOSKY. Okay. And I did not ask, and I would for the record, getting back to the Energy Frontier Research Centers, staff has indicated that your office and yourself have talked to us about those. But you did indicate there were eight or nine areas. If you could, for the record, enumerate what those areas are.

Dr. ORBACH. Of course.

ENERGY FRONTIER RESEARCH CENTERS

The Energy Frontier Research Centers (EFRCs) program was formulated based on the series of Basic Research Needs workshops organized and run by the Office of Science in cooperation with DOE energy technology programs. These workshops engaged more than 1,500 participants from universities, industry, and DOE laboratories, who identified high priority research directions to address the most critical energy research and technology gaps. Workshop topic areas include the hydrogen economy; solar energy utilization; superconductivity; solid-state lighting; advanced nuclear energy systems; combustion of 21st century transportation fuels; electrical-energy storage; geoscience as it relates to the storage of carbon dioxide and spent nuclear fuel; materials under extreme environments; and catalysis for energy-related processes.

An EFRC must address one or more of the energy research challenges described in the Basic Research Needs workshop reports. Examples of scientific focus areas that would respond to the EFRC Funding Opportunity Announcement include: direct conversion of solar energy to electricity and chemical fuels; understanding how biological feedstocks are converted into portable fuels; a new generation of radiation-tolerant materials and chemical separation processes for fission applications; addressing fundamental knowledge gaps in energy storage; transforming energy utilization and transmission; and science-based geological carbon sequestration. The EFRC program is designed to allow maximum flexibility to support a broad spectrum of innovative basic research and to bring together lead scientists from one or more institutions. We are particularly interested in tapping the imagination and creativity of the scientific community to address the fundamental questions of how nature works and to harness this new knowledge to meet some of our most critical energy challenges. Universities, DOE national laboratories, the private sector, and partnerships among these groups are eligible to apply for EFRC awards.

Mr. VISCLOSKY. Mr. Ryan.

Mr. RYAN. Mr. Chairman, I am going to pass for a minute.

Mr. VISCLOSKY. Mr. Olver.

Mr. OLVER. Thank you, Mr. Chairman.

Again, I want to reiterate the words that were said by Mrs. Emerson previously. I think you have done a wonderful job. You must be a wonderful teacher on what can be very difficult material, and a wonderful lecturer and an explainer, obviously, of this to people. I did not hear, at any point in this testimony, a hint of speaking down to any question on the part of any person on this side of the table, and I very much appreciate that.

Mr. VISCLOSKY. It might have been tempting to do. [Laughter.]

Mr. OLVER. It might have been, I don't know.

Dr. ORBACH. You are being unfair to yourself.

ITER FUNDING

Mr. OLVER. And, of course, now I am going to ask some stupid question maybe, that it will be even more tempting, I don't know.

I wanted to ask you one more thing on ITER. How much of the budget increase is for our obligations under ITER?

Dr. ORBACH. It is quite a substantial part. We are asking for $214 million in the 2009 budget for our contribution to ITER.

Mr. OLVER. So, essentially, that is the whole of the budgetary increase? If I could find the damn budget.

Dr. ORBACH. Yes. It is a little less. The fusion budgetary increase, if my memory is right, is about $206 million. But buried in that is a $203 million increase for ITER. I think those are the right numbers.

Mr. OLVER. Well, I am having a hard time finding it again. I have made myself a bunch of little tabs.

Does that grow? Is that a steady growth over the years, from year to year, is that the expectation?

Dr. ORBACH. Yes. It is a construction profile. And so we would see that grow. In the out-years, I think the budget for fusion energy sciences reaches about $500 million because of the envelope.

Mr. OLVER. If we were not to do that, if we refused to do that—or even if we join in this cooperation, as I agree with you that we really must do, would you sense that we ought to do fusion by ourselves as well? Or would we commit ourselves to whatever is being done in fusion is going to be done through ITER?

Dr. ORBACH. We can't afford to do it ourselves. We pay 9 percent of the cost of construction for ITER, and we get 100 percent of its operations.

Mr. OLVER. And you made the comment that half of the world's population is involved in that. That must mean China and India are both involved in it.

Dr. ORBACH. That is correct.

Mr. OLVER. Okay, along with the other major industrial countries.

But you don't envision, at some point, that we would try to establish that world leadership on fusion by ourselves, separate from ITER, at any point? It would all be done on a worldwide basis.

Dr. ORBACH. It is a very important question, and it is a little tricky.

For the research on ITER, no, there is nothing that can replace it, because it is a question of scale. You have to produce a burning plasma of enough energy so you get more out than you put in.

Mr. OLVER. But that is, then, committing oneself to magnetic confinement.

Dr. ORBACH. That is correct.

Mr. OLVER. Are we certain, at this point, that that is to be the only route to breakthrough on fusion?

Dr. ORBACH. No——

Mr. OLVER. And you were talking about, earlier here, this being the silver bullet maybe by the middle of the century. Well, that is almost 42 years away. We used to talk about it being 50 years away.

Dr. ORBACH. We will know if ITER works probably much sooner than that. It is about an 8-year construction and then, say, 10 years of operations. We will know in about 15 years whether it works or not.

The other areas you are thinking about—for example, inertial fusion—have not shown the ignition properties yet that magnetic confinement has. NIF, which is being built at Lawrence Livermore, will be the first opportunity to see a fuel pellet actually ignite.

So the way I have looked at it—and it may not be the right way—is that their proof of principle will occur in 2010, 2011. We will see if they can actually get ignition.

Magnetic confinement has gotten ignition. We did it at Princeton initially, years ago. And they are doing it at a place called JET in England. So the proof of principle for magnetic confinement, in my view, has been demonstrated.

Mr. OLVER. Is ZETA pinch also a magnetic confinement?

Dr. ORBACH. Yes, but it hasn't reached the scale of ignition.

ENERGY STORAGE

Mr. OLVER. Okay. All right, look, I have got to go on to something else here, or my time will have to wait for another round.

On the battery issue, is the lithium ion battery—are you anticipating any of these $2 million to $5 million-type grants to go to some alternative to the lithium ion? Or are we convinced, at this point, that this is going to be our commitment as to what would be a battery going with hybrid vehicles?

Dr. ORBACH. Oh, I can't answer that question. It will depend on the competition. It certainly appears to be the best thing we have right now.

Mr. OLVER. At the moment.

Dr. ORBACH. At the moment. Whether it will continue to be remains to be seen.

Mr. OLVER. There is some worry about closing doors to research. And these kinds of research areas, there might be something that would come in that would pose a theoretically reasonable approach to another battery that would be as good or better.

Dr. ORBACH. Or a capacitor.

ENERGY FRONTIER RESEARCH CENTERS

Mr. OLVER. Well, all right, that raises the other issue. In an earlier lifetime of mine, I was an electrochemist. And I was sitting here thinking to myself, we wrote those electrochemical reactions often with two electron transfers. And, yes, I realized as you were explaining that to us that, yes, we viewed those as occurring one at a time. Although, by the time the equation is written, you have two—I don't remember any when it was necessary to write three or more into it. It usually was one or two.

But you have now pointed out that—and I never thought of it that way—that in photosynthesis you have two electrons. Are any of these $2 millions to $5 millions going to be in the area of two electron transfer approaches to the——

Dr. ORBACH. I hope so. Again, I don't know. I am nervous about speculating on what the actual proposals will be.

We very much hope that people around our country will apply in electrical energy storage. And we are trying to give, through our own research that we have already done, examples of areas which they might address. But it is really meant to be open.

Mr. OLVER. Okay. Well, we will get some more information about what your intended areas are and how this program is supposed to work.

Dr. ORBACH. Oh, yes.

Mr. OLVER. You had mentioned that private-sector entities might compete.

Dr. ORBACH. Oh, yes.

Mr. OLVER. What kind of private-sector—what range of private-sector entities?

Dr. ORBACH. It could be——

Mr. OLVER. Industrial laboratories?

Dr. ORBACH. Oh, yes. It could be small start-up companies that have a research capability. In the pharmaceutical area you have got a lot of small companies that have superb people.

We are not limiting it. And, I must say, this is through this committee that we have developed these approaches.

Mr. OLVER. I had envisioned them mostly as university centers.

But you are going to do 20 to 30, and those 20 to 30 will be funded with the next sequences over a several-year period of the same ones that have been funded, but with the caveat that the chairman had mentioned: If something really tanks, you are certainly not going to continue it. You keep monitoring them along the way.

And then you might start another round of 20 to 30, with an additional $100 million per year, at some later time. But the intent is to do this 20 to 30 that you would first compete and fund those over a period of, say, 5 years.

Dr. ORBACH. Exactly.

Mr. OLVER. Okay.

When you want to go on, I will stay around for another round.

Mr. VISCLOSKY. Mr. Simpson. [Laughter.]

Mr. RYAN. I get nervous when he gets that look on his face.

ITER FUNDING

Mr. SIMPSON. I sit and listen to this, and it is just kind of—you know, I get kind of lost.

Do you know why it is more important to brush your teeth before you eat rather than after? That is something I know about; I am a dentist. [Laughter.]

No, I am just kidding.

Let me ask you a question. If ITER is so important, and you seem to make a good case for it, why didn't the president request funding for it in the supplemental? Have you had a problem convincing the administration, the White House, of its importance?

Dr. ORBACH. We simply don't know. I do not know, as of this moment, whether the administration will ask for supplemental funding for ITER.

Mr. SIMPSON. Have you asked them to?

Dr. ORBACH. We have certainly made it clear through the administration that we would welcome that. But it is really a presidential decision. And we do not have information.

PNNL CONTRACT

Mr. SIMPSON. Let me ask another couple. We talked about competition just a minute ago. Could you explain why your office recently canceled the competition for the contract at PNNL?

Dr. ORBACH. Yes. We had sent out a draft RFP, and in that draft we said that we would not accept as part of a proposal, a bid, the issue of a use permit. We would not allow a use permit to be part of the contract.

Mr. SIMPSON. Explain that, if you would, please.

Dr. ORBACH. The current contract at PNNL—and it is only at PNNL—allows the contractor to use federal facilities for private ventures. They pay full cost, full cost recovery. But it means that they can work with private sector, also with the government sector, through the contractor to make use of federal facilities.

And when we looked closely at it, we felt, first of all, that it was not necessary, and in some funny way it may even have been negative for tech transfer; that other laboratories that did not have a use permit were doing beautifully, working with the private sector. We just felt there were too many problems with it.

In the event Congress, as part of the omnibus bill, passed a law that said that we had to continue the use permit, unless both parties—the contractor and the department—agreed to end it, under those circumstances you couldn't get the competition to work anymore, so we canceled the competition.

And we have been in conversation with the contractor. We can do that because there is no competition on the table. And we are still in the middle of that process.

Mr. SIMPSON. Do any of the other labs have the use permit issue?

Dr. ORBACH. No.

CONTRACT COMPETITIONS

The current status of contract competitions for the remaining nine Office of Science national laboratories is: Contracts for Argonne and Thomas Jefferson were competed in FY 2006, and contracts for Ames and Fermi in FY 2007; the Berkeley contract was competed in FY 2005, and the Oak Ridge Contract in FY 2000. The Stanford contract expires on September 30, 2009 and the Brookhaven contract on January 4, 2010. The Princeton contract is currently in the process of being competed.

Mr. SIMPSON. What is the status of contract competitions for the remaining nine Science labs?

Dr. ORBACH. I don't know if I can remember all of them. Can I answer that for the record?

Mr. SIMPSON. Sure.

Dr. ORBACH. Because I am worried that my memory may not be correct.

We have made a commitment to this committee that we would complete the laboratory contracts. There may be an exception for specific reasons that will develop, but I would prefer not to talk about it. But I will provide that information for the record.

Mr. SIMPSON. What is the length of contract that we are looking at?

Dr. ORBACH. Well, typically a contract is for 5 years.

Mr. SIMPSON. Right.

Dr. ORBACH. And our new contract structure, because of our appraisal process which we instituted about 2 years ago, allows a contractor under the new contracts to earn an extra year if they score above a certain plateau that we have set for performance.

And so, in principle, assuming that the laboratory satisfies that grading system—and it is a grading system—they could have the contract for 20 years. So it is a 5-year contract, but if the performance is above this threshold level—it is quite a high threshold—then we would give them an extra year. And that extra year would accumulate out to a maximum total of 20.

Mr. SIMPSON. When we rebid the INL contract, one of the things we wanted to do—and, ultimately, successfully did with the laboratory part of the contract—was have a 10-year contract. We felt like a 5-year contract wasn't sufficient. But to have a 10-year contract with appropriate off-ramps for nonperformance. You are taking a different approach, with 5-year contracts with on-ramps for successful work that is done there.

Do you have any idea which direction do you think is the best way to go?

And our feeling was, quite frankly, that having seen it for years and having seen the different contractors come into the INL, that really what you have is 3 years of work with a 5-year contract. First year that they were coming in, they were new to the contract, they were getting their feet on the ground, getting things running. Then they worked for 3 years, and then the last year was to recompete for the lab.

And so, consequently, you didn't really get 5 years of work out of them. I don't want to make that sound like they didn't do anything those other 2 years. But it made it really difficult, and we felt like a 10-year contract was more appropriate.

Dr. ORBACH. Well, that is why we went to that year-by-year. It is proactive, rather than reactive.

Part of this depends on the appraisal process.

And we believe our appraisal process is quite robust and gives us a very good handle—it is actually public. We put the report cards on the Web, and you can compare one lab with another.

And so, if we didn't have the appraisal process, we would have this issue. But with the appraisal process and this rather high threshold for extension, we felt that we would be better off that way.

And you are quite right, if you just have a 5-year window, it is very difficult.

But this way, a contractor that is really performing at a very high level would not have that problem, because there would always be 3 or more years out in front.

CONTRACT COMPETITION FOR SCIENCE LABS

Mr. SIMPSON. Does the issue of third-party financing of buildings and so forth with some of these laboratories, do they come into the contract negotiation and extensions?

Dr. ORBACH. I don't know about the contract negotiation itself, but we have participated in third-party financing, for example, at PNNL, as part of the 300 Area. I don't know if that is in the contract or not. Again, I can find out and respond back. But we are

allowed, under our current contracts, to develop third-party financing arrangements.

THIRD-PARTY FINANCIAL

Third-party financing of buildings is not part of the consideration in the contract negotiation and extension process.

Mr. SIMPSON. Are you having trouble with OMB in doing that?

Dr. ORBACH. We have to——

Mr. SIMPSON. We had a problem at the site that was trying to do a third-party financing, and OMB was a difficult customer.

Dr. ORBACH. Yes, they are a difficult customer, but for good reasons. They are trying to make sure that this is in the government's interest. And that is not so simple to prove.

And, in fact, on the PNNL situation, as I indicated, there are two of the three buildings that will enable us to exit the 300 Area that will be third-party financed.

And they were very difficult, but I think for the right reason. They wanted us to show that it was in the government's interest to do this, rather than just build them. And they made us jump through hoops.

Ultimately, they approved it. And I think that we were able to show that it was the right way to go.

But I welcome that kind of supervision. I mean, it is the right thing.

Mr. SIMPSON. And I don't disagree with the supervision. Sometimes I wonder about the extent of their oversight and how restrictive they are getting, because, as you know, in most of our laboratories, we have aging facilities. We don't have the infrastructure budget to rebuild a lot of these facilities. And, consequently, we try to turn to other sources of trying to finance some of these things.

I mean, we have scientists at the INL in old garages and old grocery stores? These are the top-notch scientific laboratories that they should be. And if we can't get the infrastructure needs through appropriations through Congress, other sources of financing through third parties is, to me, a viable alternative to do.

Dr. ORBACH. I concur. And, actually, I visited INL and saw those facilities. They have to, nevertheless, be in the government's interest to do that financing as opposed to direct appropriation. And it has worked. I mean, 2 years ago, or a year ago I guess, we got the green light and we have gone forward at PNNL.

CHAIN OF COMMAND FOR LANSCE FACILITY

Mr. SIMPSON. Let me ask just one other series of questions. The LANSCE facility at Los Alamos is in a unique position. This is a major science asset, yet it resides physically in the middle of a weapons lab.

What is the chain of command for reporting for this facility?

Dr. ORBACH. This is CINT, are you referring to?

Mr. SIMPSON. LANSCE.

Dr. ORBACH. Oh, LANSCE. I am sorry. I misunderstood. LANSCE is a facility for not only our work, neutron diffraction through the Lujan Center, but also for weapons studies. And that is sponsored by NNSA.

And part of the stored beam in LANSCE is used by us for open science at the Lujan Center for neutron diffraction, which is a pulsed neutron source.

Mr. SIMPSON. So what is the chain of command for reporting for that?

Dr. ORBACH. That is right up through NNSA, for LANSCE, is right up through NNSA.

Mr. SIMPSON. Given the limitation of your authority over Los Alamos imposed by the NNSA act, how do you ensure that this asset remains responsive to the science programs?

Dr. ORBACH. I think it has been just the other way around. I think that our relationships with NNSA have been such that they want to see the Lujan Center succeed. And so they have been very, very supportive of the center and trying to refurbish LANSCE to provide beam to the center. We have not had any difficulty.

Mr. SIMPSON. And how does the user community access facilities that are at weapons labs? And are there restrictions on university personnel and foreign-born nationals and other people for using it as a user facility?

Dr. ORBACH. The answer is that we require all of our user facilities to be open. We do have restrictions—

Mr. SIMPSON. How does that work at a weapons lab?

Dr. ORBACH. People access a database and get access to the facility.

Mr. SIMPSON. So you don't see any restrictions? There are no problems with them——

Dr. ORBACH. There is a problem for countries that are determined to be terrorist-supporting. Citizens of those countries or individuals born in those countries need special access.

And we have a process within the department where I and the other relevant agencies in the department review their role and make sure that it is not in conflict with government policy, and then they can also gain access.

Mr. SIMPSON. So you don't see any problem that has been imposed by having this at a weapons lab?

Dr. ORBACH. Well, I think——

Mr. SIMPSON. Should we, in the future, be looking at——

Dr. ORBACH. Yes, that is a hard one for me to answer. I think, for a graduate student having to go through the process of gaining access, it can't be very comfortable. But on the other hand, they do it. And so it seems to work pretty well.

CINT—that is why I asked you about CINT—is the nano facility which is jointly located at Los Alamos and at Sandia. And there it is outside the fence. And what it is, is a vehicle for reaching in, but there is no security. It is outside.

On the other hand, our combustion research facility, which is at Sandia in California, is behind a fence, but it is not a very tall fence. You have to get permission to go through, but once you are through, even though you are in between Sandia and Livermore, it is fine. It is open. And it is a completely open laboratory.

So there is probably a certain amount of frustration for people, but we try to keep that to a minimum.

Mr. SIMPSON. Thank you.

Mr. VISCLOSKY. Mr. Ryan.

Mr. RYAN. Thank you, Mr. Chairman.

Thank you for being here. I apologize for missing early. I have a committee the same exact time, every time that I have this committee, and I have to choose, unfortunately, pick my spots.

A lot of this—I represent a district that is very similar to the chairman's district. And I have a lot of economic issues, as does much of the industrial Midwest. And so I have an interest and my district has an interest, and I think the chairman, as well—I don't think I am speaking out of line—an interest in converting the science into economic development somehow, whether it is through the medical field, whether it is through alternative energy, you know, however this works.

And I know I am going to spend as much time as the good people of the 17th District of Ohio give me in Congress to try to make sure that we are commercializing, we are making sure that we are developing our science into jobs for Americans, new jobs, high-wage jobs.

And we have had a huge discussion over the last few weeks. If you are alive and your brain is working in America, you have heard the word NAFTA and globalization and the effects that this has had on a lot of our communities.

And so I just think it is imperative for us to figure out together and work together on how we make this work and how we convert our science into jobs and economic development. So some of my questions are going to focus on that.

One point of interest here, the Energy Frontier Research Centers—and I hope you didn't get too deep into this—can you talk to me a little bit about what your plan is for this additional money that you are requesting? Where would it go?

I have a concern, as well as Mr. Visclosky, on this money not making its way toward small universities. And so I heard you say that that is where you have come from, so that is a comforting fact.

And so can you just talk a little bit about the program? Would the money be used for all science? Would it be used for buildings, facilities, those kinds of things?

Dr. ORBACH. It is not meant for facilities, and that would not be allowed. It is meant for people and for laboratory equipment as might be required.

It is really meant for people in small institutions, I mean, not just limited to them, but you don't need—like a basketball team, you don't need more than five really good players to make a difference.

And so, if you have a small institution—and like most small institutions, you don't have many to go across the full spectrum, you put your money where you want to and try to make a difference. And most small institutions operate that way.

So my guess is that there will be a mix. The small institutions in your district and any other district will be able to compete directly for this funding.

Universities themselves have become very interested in tech transfer. And almost every university—small, medium, large—have

a tech transfer policy. They like to see spin-offs. They may have industrial parks associated with the institution.

Everyone wants what you have described, and so do we.

So I would argue that these competitions would enable regions across our country to compete where people are hungry, want to really do something.

And the energy sphere is a perfect place to start, because if you think it is bad now, it is only going to get worse. And we are seeing that literally day by day.

And so this is a growth field, and I can't think of a better area for young people to become involved in for the future of our country and, indeed, our globe.

TECHNOLOGY TRANSFER

Mr. RYAN. Are there any recommendations, through your experience, on what we could do better with the tech transfer and with the commercialization of some of these?

Dr. ORBACH. We actually have a program in the department for tech transfer. In fact, I am the tech transfer coordinator. And we are trying to make a more effective tech transfer process in the Department of Energy. The secretary just issued a policy statement on tech transfer, which is the first policy statement since 1991 from the department.

But tech transfer depends on the institution, because they hold the patent rights, the licensing rights, to research that is conducted within their institutions. So at universities, for example, most every university, small or large, has an approach for licensing inventions that are created by its faculty, for example.

And that is a university issue. And I think they are pretty impressive, actually, in that regard.

So what I would suggest would be that, where institutions want to get involved in energy, that this is a real opportunity.

And if they are not familiar with us, please come and talk with us. Our doors are open. We talk with everyone about the opportunities here. And we would welcome that kind of contact.

Mr. RYAN. We will call your scheduler.

Dr. ORBACH. Good.

ENERGY FRONTIER RESEARCH CENTERS

Mr. RYAN. And we will make that happen.

The proposal looks like it is $2 million to $5 million annually, as how it would break down.

Mr. ORBACH. That is correct.

Dr. RYAN. Is that enough?

Dr. ORBACH. For a university, for example, it is a fair amount of cash. I mean, you are talking $2 million to $5 million. Most of the current centers that are out there are in the $1 million to $2 million level.

We have it up to $5 million because we wanted to leave that window open in case larger groups wanted to get together. Again, we don't know what we are going to get, so we tried to give it a range, and we will see.

Mr. RYAN. Is there a match required?

Dr. ORBACH. No.

Mr. RYAN. No match?

Dr. ORBACH. No match and no outreach. This is straight research. We are out to get energy.

ISOTOPE PROGRAM

Mr. RYAN. I like that. I like that no match.

I have another question with regard to nuclear medicine. One of the issues there is—where my district is between Cleveland and Pittsburgh. And there are hundreds and hundreds and hundreds of millions of dollars in research between the Cleveland Clinic and Case Western Reserve and university hospitals and University of Pittsburgh Medical Center.

And so what our goal is to try to figure out how cities like Youngstown and, kind of, the old Rust Belt cities plug into this research.

And so I was just reading—and I don't know a whole lot about this, and I was hoping you could enlighten me a little bit—with nuclear medicine and the medical isotope program, and there has been some switching of responsibilities there.

Can you talk a little bit about what your plans are? And how much of a priority this is for you? And what would you see the future of this program being?

Dr. ORBACH. This is a major issue for us. The department has proposed to switch the isotope program from nuclear energy to the Office of Science and into our nuclear physics program. And the reason for that is the research side of it. And so there will be about a $3 million add that we will focus on research with isotopes.

We have established a working group with NIH, because we don't want to be the ones that specify what the isotopes are for. And so we have a working group, as I said, right now, and I will meet with Dr. Zerhouni at some point. And then we will establish a workshop this summer for the community at large, people you are talking about.

NIH and DOE Office of Science will have, I hope, worked out a relationship between us. We don't want to do the medicine. That is NIH's expertise. But on the other hand——

Mr. RYAN. We don't want you to do the medicine.

Dr. ORBACH. No, you don't want a physicist doing medicine.

But on the other hand, we know how to produce isotopes, and we know how to handle that process.

And it may not just be from reactors. It may be from accelerators, as well. But we don't know which isotopes the nuclear medicine community requires, because, again, there is a research issue here. And they are experimenting with different isotopes.

And there are issues with delivery and lifetimes.

The thing is really quite complicated. So we first want to get a relationship with NIH worked out. And then we are going to open it up and ask the community what it needs and wants, and ultimately establish a prioritization, because we certainly will never be able to produce enough isotopes for everyone.

But we will, I hope, as a consequence of this, have the community in sync with our two agencies, in terms of the direction we need take.

Now, in parallel to this, we have another program which we call radiochemistry and instrumentation. That is in another program we have. And that is the one that has looked at things like PET scans and visualization in living creatures and sometimes humans.

And those two have been separated. We want to bring them together, because they use isotopes, as well. And so, depending on what the community comes up with and what arrangements we can work out, we would like to really make a difference in this area.

Right now, the United States depends on Canada for—I have had a technetium–99 examination, but the molybdenum–99 is produced at Chalk River. We depend on Belgium for isotopes. But because they have half-lives sometimes that are very short, we can't make use of all of them.

So we need to come up with a plan for the United States, in terms of our needs.

Mr. RYAN. So there are no universities included now——

Dr. ORBACH. Actually, there are.

Mr. RYAN. There are?

Dr. ORBACH. The University of Missouri is a producer of isotopes through their nuclear reactor. And we do some at HFIR, at Oak Ridge, and I am afraid I don't know all of them. But, no, universities are involved.

Mr. RYAN. Okay. And then you will open that up and——

Dr. ORBACH. Absolutely.

Mr. RYAN [continuing]. Include more? Okay, great. Thank you.

Thank you, Mr. Chairman.

ISOTOPE PRODUCTION

Mr. VISCLOSKY. Doctor, if I could follow up on Mr. Ryan for a second, you mentioned radioisotopes. Is there a supportive environment for that radioisotope effort with the administration?

Dr. ORBACH. Well, I hope so, yes.

Mr. VISCLOSKY. From a funding standpoint?

Dr. ORBACH. Well, the funding from nuclear energy is being transferred. And there is an additional $3 million.

Mr. VISCLOSKY. And that will be enough for you?

Dr. ORBACH. Well, but that is not all the funding, because if it is like technetium–99, for example, that is just a standard isotope that the community pays for. And so parts of this are reimbursed.

The issue which is more tricky is research; that is, when an institution of the sort, for example, that Congressman Ryan has mentioned—these are research hospitals. They may want to experiment with a new isotope, and a new isotope can be very expensive to produce.

Who is going to pay for it?

And that has been a real problem with the medical community. And I don't know the answer to that. And that is something we need to work out with the community.

If we don't have enough money, we will ask for enough, if it is appropriate, for the government to provide it in a subsequent budget. But I can't answer that now, because I don't know what the community will require.

Mr. VISCLOSKY. And it would be NIH's role to determine what isotopes are necessary for what medical purposes?

Dr. ORBACH. Precisely.

Mr. VISCLOSKY. From a research perspective, it would be your responsibility to research how best and most efficiently to then produce those isotopes?

Dr. ORBACH. That is correct.

Mr. VISCLOSKY. And under the administration's proposal, then, to move the production to your office, you would also then produce them?

Dr. ORBACH. That is correct.

Mr. VISCLOSKY. Is the production aspect of this—are you the right shop for that?

Dr. ORBACH. Well, considering they use our facilities to produce them—HFIR is an Office of Science facility——

Mr. VISCLOSKY [continuing]. Using your facilities now——

Dr. ORBACH. Oh, yes.

Mr. VISCLOSKY [continuing]. To produce it?

Dr. ORBACH. We have a very close relationship with them. I am now the chief technical officer for nuclear in the department for the Office of Science. I can't remember the acronym. But we have always worked closely together, because we have the facilities.

Mr. VISCLOSKY. So from your perspective, there would be a rationale——

Dr. ORBACH. Yes.

Mr. VISCLOSKY. And, of course, weatherization has nothing—well, it has nothing to do with this hearing right now. But one of the arguments about zeroing out weatherization under DOE is, well, that is not where it is supposed to be. And I am just wondering, is production of those isotopes in your shop where it should be?

Dr. ORBACH. I believe so. We haven't had the meeting yet with the community, so I am a little nervous about some sweeping generalization. But our nuclear physics program has the technical knowledge to handle production of isotopes. And we have a research base.

And what has been missing is the research side of isotope production. And that is why the transfer was made.

Mr. VISCLOSKY. And you continue to do the research on the production aspect, not just——

Dr. ORBACH. Production——

Mr. VISCLOSKY [continuing]. Production, but how you can best do it, how you can improve the efficiencies?

Dr. ORBACH. Absolutely.

Mr. VISCLOSKY. Okay.

Dr. ORBACH. And how we can be responsive to the medical community.

CLIMATE CHANGE RESEARCH

Mr. VISCLOSKY. And I have a couple more, and then I will recognize Mr. Olver.

But you—because I think almost everyone has asked about the Energy Frontier Research Centers. And while there has been a lot of give-and-take here this year and in past years about the admin-

istration following directives and earmarks and what have you, I would just point out this has been, I think, a very positive example of where you have two co-equal branches of government.

And under Mr. Hobson's leadership, when he was Chairman, pressing that we want to be as inclusive and broad as possible, because large institutions or those who have been favored in the past may not have all the good ideas. Small institutions may not have all the good ideas. And we ought to cast a reasonably wide net in a financially responsible fashion.

And I really do think that you and the department, in this instance, took that to heart and have tried to design a program to do just that. And I think that type of give-and-take and collaboration that, if we saw a little bit more of it, the country would be a lot better off.

So I would just make that observation. I do have some additional questions.

We are also pleased with your decision to substantially increase funding for climate change modeling. However, we are concerned about the state of funding for the science on the ground needed to inform those modeling efforts, as well as the broader modeling needed to understand their wider impacts.

Integrated assessment models which are used to try to understand the wider impacts of climate change, as well as the impacts of various climate policy and technology options, have been receiving flat or decreased funding. As we increase funding for modeling, shouldn't we also be increasing our efforts to try to understand its impact and mitigation options on the ground?

Dr. ORBACH. Yes, absolutely, and also to look into the inputs into those models from soils, from clouds and so on. We are having a workshop this month, on the 26th of March, precisely to respond to that question, namely, where should we put the money? There is an increase in our budget.

Mr. VISCLOSKY. Do we need additional money——

Dr. ORBACH. Well, we have asked for additional funding for climate research. And what we want to do is to understand how best to use those funds, what fraction of it should be used for inputs, and what fraction should be used for modeling.

Mr. VISCLOSKY. So you have asked for more money for the input side, not just the modeling side?

Dr. ORBACH. That is correct. We do not know the—I don't want to say that I know the answer yet. We have put them into a basket. And what we are going to try to do is optimize how they interface with one another.

And to do that, we are having an open workshop, as I said, toward the end of this month. We have the best people in the country coming.

Mr. VISCLOSKY. Let me ask you this. You have asked for an increase and you are looking to see what that balance should be, as far as the input and the modeling. Would there be some efficacy if you had additional funds in that account? And if so, would you want to speculate as to what the range of that would be?

CLIMATE RESEARCH FUNDING

Dr. ORBACH. Well, it would be awkward to speculate. I would prefer to wait for the workshop to see the nature of its results.

You said something else that is very important, and that is, when you talked about climate, you also talked about adaptation and its consequences.

And that is something that has not been built in. And one of my dreams is to build that in, that is, to integrate the human person response into a modeling and measurement structure.

Right now, when we do climate modeling, we have an integration between the atmosphere and the ocean. We allow them to interface. And that integration then drives the climate predictions.

But when it comes to the humans, we just ask, "Well, okay, if this happens, what do you do?" We never ask, "Well, maybe the humans would respond and do things differently if such-and-such took place," in other words, to have an interactive model between human behavior and these physical climate issues.

Mr. VISCLOSKY. Would that be part of the discussion in your workshops?

Dr. ORBACH. It will be. Whether we have the capability of actually doing that remains to be seen. We need to work with the social science community and also our computational community to see if we can accomplish it. But that is where I would like to go.

Mr. VISCLOSKY. Didn't Isaac Asimov write a trilogy about that concept, the "Foundation" trilogy?

Dr. ORBACH. Help me.

Mr. VISCLOSKY. Okay, we will move on. [Laughter.]

ITER FUNDING

One last thing, and then I will turn to Mr. Olver. If there is no funding for ITER, what are the other options?

Dr. ORBACH. Oh, goodness. Well, we are, first of all, committed to remain part of the ITER organization for 10 years. And if there is no funding for ITER in 2009, it will be a dreadful setback.

To be honest with you, I haven't anticipated such a consequence because the consequence—to think of what might happen down the road if ITER works and we are not a part of it—we are talking about the energy future of the world and the United States is out of it.

I was asked a question before about what is in it for the United States, for the fusion community. And if ITER works, then the first thing I would do is to try to get the community in the United States on a path towards a demonstration reactor, that is, to build a power reactor.

That would be a demonstration—this is all in the out-years. But we would want to be the producer of it. And if we are not part of it and the rest of these other six parties are—you know, right now we are spending a lot of money to buy oil. Just imagine if we end up spending it to buy electricity.

I just think that it would be so awful for our country, I haven't really considered it.

Mr. OLVER. I guess that almost requires me to weigh in a little bit here on that question, Mr. Chairman. We are committed to, if

I remember correctly, something like 9 percent or 10 percent of the development of ITER. And so that 9 percent or 10 percent per year means that there is $2 billion or something like that for the development of the program.

I have people in the science field who tell me the piddling amount that has gone into it year by year by year by year by year is a major part of why it is we have not reached that question of whether that silver bullet is actually there; that if we were to spend $1 billion or $2 billion, $1 billion a year for 15 years, or $2 billion a year for 10 years, or something like that, then we would get there, then we would be most likely to get there, to actually achieve it.

So, to me, not taking part in this one really does put us behind the eight-ball in a very severe kind of a way. I would just leave that. And that is not very well-articulated, perhaps.

BIOFUEL RESEARCH

To go back to an earlier question by Mr. Pastor, who was talking about use of algae, growth of algae as a biofuel, as a bio-feedstock essentially, you then went beyond that and started talking about the creation of hydrogen from perhaps algae, but then you went on to bacterial.

But it turns out, 40 years ago, when I decided to leave chemistry, I took a sabbatical, a year or two to run for political office. And the last sponsored research program that I was involved in was one—I was a junior collaborator in it—was a bacterial production of hydrogen, in which the Air Force Office of Scientific Research had some interest for some space purpose.

Now, just let me ask you: Since you have raised it at that point and sort of took the use of algae as a feedstock to that, which was a little off that topic, does that suggest that there is still some hope? Would that be one of the areas that is among your group of areas that your $2 million to $5 million might end up working in?

Dr. ORBACH. Absolutely.

Mr. OLVER. Absolutely.

Dr. ORBACH. And what has changed——

Mr. OLVER. That is very interesting.

Dr. ORBACH [continuing]. Since you and I studied that has been genomics has the ability now to sequence and to modify.

Mr. OLVER. Exactly.

All right, the last one I wanted to touch on, on the three big centers, they are down for the development basically of cellulosic ethanol and other biofuels. Now, are you talking about ethanol, other alcohols, other biofuels containing oxygen or are you really talking about all kinds of biofuels?

Dr. ORBACH. I am talking about gasoline. I am talking about diesel fuel. I am talking about all kinds of biofuels.

Mr. OLVER. All right, then what I want to—I have a paper which I am going to give you. It is a group of scientists and engineers from the university that I abandoned 40 years ago, that have come back with at least a paper that they thought I would still understand, and asked me to try to make certain that we didn't close some of those other potential routes.

Dr. ORBACH. Is that UMass-Amherst?

Mr. OLVER. Yes.

Dr. ORBACH. I know the group.

Mr. OLVER. You know the group——

Dr. ORBACH. And not only is that not——

Mr. OLVER [continuing]. George Huber and so forth?

Dr. ORBACH. Yes, absolutely. In fact, I talk to Dimmesic, who is at Wisconsin, who was his advisor, thesis advisor, and asked him about—and they were the ones actually who have been developing the catalytic methods. And they produce gasoline.

Mr. OLVER. Okay, you mentioned those. And I didn't know whether you had—how far that had reached into your research protocols.

Dr. ORBACH. Oh, it is very much a part of it.

Mr. OLVER. Because they have the gasification to syngas and the pyrolysis mechanisms. There is a whole series of mechanisms where you can go directly to hydrocarbons, but it turns out that you go beyond the sequence that gets you to ethanol in the process, and then start rebuilding the molecules into your hydrocarbons.

Dr. ORBACH. That is precisely it. You strip the oxygen from the sugars.

Mr. OLVER. Right.

Dr. ORBACH. You then create the linear molecules. It can have six carbons; it can have more. And then you do another catalysis to turn them into the cyclic compounds that produce gasoline.

BIODIESEL RESEARCH

Mr. OLVER. So you have got fuel and biodiesel and gasoline-type things. And my first reaction was that the energy balances on this, carrying it all the way down and then rebuilding, would be unfavorable. But then the efficiencies of the various processes along the way, if they fit together, you can actually have a breakthrough there, quite significantly.

Dr. ORBACH. I believe so. And what is so special about what they are doing at UMass and also at Wisconsin is the temperature. Normally you think of catalysis at very high temperatures and then you have got to put energy in. They got the temperature down to a couple hundred degrees Celsius, which is quite remarkable for a catalytic process, as you remember.

And so there is a lot of hope here. First of all, they would certainly be welcome to compete for the Energy Frontier Research Centers, but we already are supporting research in catalysis for fuels on an individual project basis.

Mr. OLVER. But this is already going on in your three big centers, your three big group centers?

Dr. ORBACH. No, it is only going on in one of them. It is going on in the Wisconsin center.

Mr. OLVER. I see.

Dr. ORBACH. That is where Dimmesic is located. But that is what I meant when I said they are complementary.

Mr. OLVER. For the $2 million to $5 million again, in part?

Okay, I think I have finished, Mr. Chairman. Thank you very much.

Mr. VISCLOSKY. Mr. Simpson, anything?

Mr. Ryan.

HIGH-ENERGY PHYSICS

Doctor, two other areas, and then obviously we will have a large number of questions for the record.

The 2008 omnibus bill did not provide funding for the NOVA activity and limited funding for the International Linear Collider and superconducting R.F. R&D activities in the high-energy physics program. These activities were included in the 2009 budget request.

Have you formulated a plan for fiscal year 2008 that would enable these programs to retain capabilities that they would require to carry out activities that you have budgeted for 2009?

And the second question I would have is, is there any consideration about asking for a reprogramming request relative to the program?

Dr. ORBACH. Well, the answer to the first question is yes, but we want to put it in a context of the future of high-energy physics. This was a question that you addressed at the very beginning.

With the 2008 appropriation and with CERN starting to come on, the large hadron collider—and actually, this year, they will get their first beam—we have asked a larger question. And so we have gone back to the High Energy Physics Advisory Panel—they call it HEPAP—and asked them to consider how they would use the budget that they have now and other budgets to prioritize what they do to give us maintenance of world leadership.

That is, what should we be doing with the funding we have available, and hopefully additional funding, that would be in the best interests of high-energy physics, in terms of leadership?

And that committee is meeting as we speak. It will issue, I believe, a preliminary report at the beginning of April. And then, at the full HEPAP meeting about a month later, the full committee will consider its recommendations.

So we are addressing the issue that you raise. And we will have, I hope, a roadmap for the community that will give us a better fix on the directions we are to go.

SUPERCOMPUTING RESEARCH

Mr. VISCLOSKY. It seems that some of the expertise and capabilities that we have developed in our civilian national labs in supercomputing might be of significant interest not only to other scientists, but also for commercial applications, like designing better engines. You had mentioned earlier the issue of coal and fossil fuels.

I believe your scientific discovery through advanced computation and the Innovative and Novel Computational Impact on Theory and Experiment programs are aimed at taking advantage of such opportunities. Could you, in the time we have left, tell me a bit more about these programs and what kind of projects you are funding with it that would have commercial implications and applications?

Dr. ORBACH. We have been very pleased with the response of the commercial sector, because this is new and they haven't had experience with these kinds of computational platforms before. We have

17 companies now that have competed for time on our leadership class facilities and been successful.

We started with two. The year before last, we had four. Last year, we had 11. And now we have 17. And the reason for the increase has been the remarkable results that industry has achieved, not just big industries, but small, medium and large.

What we do is, when an industry is interested, we start them off, if they haven't had experience with supercomputers—because these are not simple to work with—we begin their programs at NERSC. That is our supercomputer at Berkeley. And we work with them to introduce them to the use of the computer and to develop codes that can then run on what we call our capability machines at Argonne and at Oak Ridge.

We have had phenomenal success. Boeing has reduced the number of wind tunnel tests, which are very expensive. In fact, they have been so successful they have asked us for proprietary time on the Oak Ridge machine, and we worked out, as I answered before, a scheme for them to pay the full operating cost.

Proctor & Gamble, I have been told, will no longer issue a new product without actually going through a simulation to see how it performs. Pratt & Whitney has come out with a new, more efficient jet engine, which we are told was a direct result of the simulations that they performed on these supercomputers.

We are seeing more and more evidence of reducing time to market and virtual prototyping by industry on these machines. This is an approach that no other country is doing. We really have set out, in my view, a quite U.S.-like leadership here, where we bring industry in to our scientific facilities and give them access and work with them.

Ultimately, some of these industries may buy their own supercomputers. This gives them a chance to see what they can do with them and then determine whether they want to invest in them.

If that is the case—and I believe it is—we are going to generate a market, then, for the producers of these machines, for the vendors in the private sector. That would be the ideal.

Mr. VISCLOSKY. Doctor, thank you very much. And I always do believe actions speak louder than words. And while you received an increase of $220 million in the omnibus, I would again note from my opening remarks that the House mark was $717 million, which I think is an indication of the belief that members of the panel have that you have tried your best in a number of areas.

And one that I haven't specifically addressed, but, again, there have been questions and comments about is trying to integrate basic science, as far as its application, and then, even most recently, the commercialization.

I can still remember a meeting, both of which we attended in Mr. Hobson's office, with a broad range of people, one, to integrate work on supercomputing and then to make sure there is some application, too.

So I really do appreciate that, and certainly appreciate the members' attendance and wish you well in this year of 2008.

Thank you very much.

Dr. ORBACH. Thank you, Mr. Chairman.

[Questions and answers for the record follow:]

QUESTIONS FROM CHAIRMAN VISCLOSKY

OUT-YEAR ASSUMPTIONS FOR SCIENCE

Chairman Visclosky. Dr. Orbach, in FY07, you asked for an increase of $500 million for the Office of Science budget – you received an increase of $200 million. Then, for FY08, your request included an increase of $600 million for the Science budget – you received an increase of $220 million. Now, you are asking for an increase of $750 million for Science. Given recent history, it would seem to be unwise to make operating decisions for the Office of Science assuming that that the President's request will not be changed.

The Office of Science request represents a 19% increase in funding over FY 2008 enacted levels. In your view, is a comparable increase in the level of research manpower supported sustainable over the long term given current fiscal pressures?

Dr. Orbach. Overall, while Office of Science FY 2009 request would grow nearly 19 percent over the FY 2008 budget, the scientific workforce supported by the Office of Science would grow nearly 13 percent during the same period. With approval of the FY 2009 request, Office of Science outyear plans assume growth consistent with the American Competitiveness Initiative and America COMPETES Act, which would result in funding growth of about 6 percent per year. No scientific workforce projections have been made for the outyears, but we expect continuing workforce growth to be smaller than 6 percent which we believe to be a sustainable level.

Chairman Visclosky. Could you describe the growth assumptions used in making operating decisions for FY08 and that have gone into the allocations you have proposed for your FY09 request?

Dr. Orbach. The rationale for the growth assumptions in the America COMPETES Act and in the FY 2009 budget request is that discoveries in the physical sciences are the basis for our economic security and underpin all of science and medicine. The FY 2009 request supports full U.S. participation in the ITER partnership, enhanced research funding including Energy Frontier Research Centers to focus on energy and science grand challenges, optimal operations at most Office of Science user facilities, and new and upgraded user facilities to ensure U.S. scientific leadership into the future.

SCIENCE LEADERSHIP

Chairman Visclosky. Some scientists, particularly those in particle physics, raise the issue of U.S. leadership when advocating for increased federal support.

In what areas of research sponsored by your office do you believe that the United States is clearly the world leader and in which areas is it not?

Dr. Orbach. Leadership in science is one of the defining characteristics of this country. Our research capabilities, including the suite of cutting-edge scientific user facilities at the national laboratories, and the diversity of Federal R&D funding sources available to U.S. researchers are the envy of the world. By maintaining a world standard of excellence in all major research fields and most major subfields, the U.S is poised to take advantage of major scientific advances no matter where in the world they occur and apply those breakthroughs to our own scientific advancement and innovation efforts. Likewise, because of the interconnection between fields, it is possible that neglect in support of a major field or subfield will slow progress and discoveries in other fields. For example, it is well recognized that instruments and discoveries in the physical sciences enabled tremendous advances in the life sciences over the past several decades. What synchrotron light sources and other imagining technologies have done for field of structural biology and pharmaceutical development is one illustration of this. Several National Academies studies over the past two decades have echoed the importance of scientific leadership in the most promising areas of science and technology to achieve our national goals. The U.S. must also be ready to seize upon the discoveries of other nations should those new discoveries increase the importance of other fields.

Our facilities—those in operation and those under construction—for advanced scientific computing, for x-ray and neutron scattering, for nuclear physics, and for high-energy physics are world leading. So, too, are our research programs in the accompanying areas. The Leadership Computing Facilities at Oak Ridge and Argonne national laboratories are among the top fastest computers in the world available for open science. The Linac Coherent Light Source when operational will produce x-ray beams 10 billion times brighter that today's best light source, enabling unprecedented studies of nanoscale objects at exceedingly faster time scales. The Tevatron at Fermilab is still the world's highest energy particle collider for physics research currently operating. The Relativistic Heavy Ion Collider is capable of creating the highest energy heavy ion collisions in the world has enabled a world-leading nuclear physics program in the U.S.

Our goal is to be world leading or among the world leaders in every aspect of our portfolio investments. In some cases, strategic partnerships are required to enable the U.S. to be among the world leaders, for example, in high-energy physics at the LHC or in fusion energy sciences at ITER. Such partnerships will likely be necessary in the future as "big science" touches more disciplines and as the cost of projects grow beyond the reach of a single investor. Our strategic planning for facilities and for research programs has focused our investments in the areas of research most important for our Nation's scientific leadership and energy and economic security.

Chairman Visclosky. Is it reasonable, given the size of the economy of the European Community, for the U.S. to expect to lead in all fields of science?

Dr. Orbach. It is reasonable to expect that U.S. federal funding will enable the U.S. to be world leading or among the world leaders in every important area of science and technology. There are two important classes of investment: The first class seeks to provide fundamental new understanding of how nature works; success allows us to explain old things in new ways, as did quantum mechanics at the turn of the last century. The second class provides new tools that enable discovery, as did the x-ray and neutron scattering facilities and the high-energy and nuclear-physics particle colliders developed during the past half century. These tools allowed us to "see" the double helix strands of DNA and subatomic particles. Every budget, no matter what the size, will necessitate strategic investment decisions. That stated, other countries are making substantial investments in research and research infrastructures. If the U.S. loses leadership in research capabilities and funding for major research fields, we will no longer be a destination of choice of graduate students and post docs internationally, and we will become a next exporter of our intellectual talent as they leave to take part in leading research opportunities elsewhere.

Chairman Visclosky. I've heard you say in the past that the Office of Science does "science with a mission." Which elements of the proposed funding increase for FY 2009 are critical to maintaining or achieving U.S. world leadership as well as furthering the mission goals of the Department more broadly? Which are not?

Dr. Orbach. The increase for the Office of Science is large, but every part of that increase addresses U.S. world leadership and mission relevance. In FY 2009, most of the increases are directed to ITER (+$203,874,000), the world-leading burning plasma fusion experiment; to the Energy Frontier Research Centers, which will support work in multiple areas of energy production, storage, transmission, and use (+$100,000,000); to more optimal operations of our major scientific user facilities, which together will serve over 21,000 users in FY 2009 (+$71,270,000); to the construction of the next generation of facilities such as the NSLS-II, a synchrotron light source that will have technical specification that make it best in the world for spatial resolution (1nm) and energy resolution (0.1 meV); the LCLS, an x-ray source with unprecedented intensity, special coherence, and ultrashort pulses; the 12 GeV upgrade of the Continuous Electron Beam Accelerator Facility at Jefferson Laboratory, which will enable advanced studies into nuclear structure; and scientific instrument fabrication (+$136,280,000)—capabilities, which coupled to research investments will enable the U.S. to be at the leading edge of discovery in as such as materials, structural and systems biology, catalysis, nuclear physics research, and research at the nanoscale. Increases are also requested for research in high performance computing, biology, chemistry, materials sciences, plasma sciences, high energy physics, accelerator technology development, and nuclear physics (+$265,387,000). This increase will support over 23,700 Ph.D.s, graduate students, undergraduates and technical staff—part our nation's current and future skilled workforce, and will support the use of our scientific user facilities this year by over 21,000 researchers from universities, national laboratories and industry.

Chairman Visclosky. Are there ways in which we can better focus the Office of Science on areas of scientific research which are both mission relevant and have the greatest potential for U.S. leadership?

Dr. Orbach. We believe that we are making optimum decisions, during periods of challenging funding that may require program restructuring with the goal of being a world leader in everything we do. Our strategic planning for facilities and for research programs has focused our investments in the areas of research most important for both the Department's missions and the Nation's scientific leadership. Our planning decisions are informed by research areas of opportunity identified through processes that involve significant input from the broader scientific community such as scientific workshops, Federal Advisory Committees, and external reviews such as those by the National Academy of Sciences.

One example of how we are positioning our investments for research to achieve mission impact and the greatest potential for U.S. leadership is in the area of high energy physics. We plan to run the Tevatron at Fermilab all out until the Large Hadron Collider (LHC) is operational at CERN to gain as much science as possible from this investment before the LHC succeeds Fermilab at the energy frontier. At the same time we are making investments to enable U.S. scientists to play a strong role in LHC science and enable a world-leading research program at the intensity frontier and in non-accelerator-based high energy physics. Our investments in accelerator and detector R&D also enable U.S. researchers to stay at the cutting edge of technology for a next-generation accelerator facility and the potential to bring the center of energy frontier back to the U.S. in the future.

Following a review by the National Academy of Sciences in 2006, we reoriented our strategy for support for research capabilities in the Biological and Environmental Research (BER) program for systems biology for bioenergy research and instead initiated the three Bioenergy Research Centers in 2007. The National Academies recognized the Department's unique role in supporting biotechnology and systems biology research specifically for applications in bioenergy, carbon sequestration, and environmental remediation, and they advised that a research center approach would enable the Department to capture the intellectual talent at universities and national laboratories, initiate the research activities sooner, and take advantage of the technologies and discoveries that had developed since the original BER infrastructure plan was established. The three Bioenergy Research Centers are now operational and are poised to make remarkable discoveries for sustainable bioenergy approaches and at the same time contribute to U.S. leadership in genomics, molecular biology, biochemistry, and subfields that span biology, physics, and chemistry.

Another example is our investments in the Nanoscale Science Research Centers and their proximity to world-leading neutron scattering sources, such as the Spallation Neutron Source, and light sources, such as the Advanced Light Source and Advanced Photon Source, have not only enabled research discoveries that are relevant to the Department's

missions, they have provided the U.S. research community and industry with remarkable capabilities for materials design, synthesis and characterization that will accelerate innovation. These investments have the potential for broach impacts in fields such as energy technologies, information technology, and biomedicine.

R&D INTEGRATION

Chairman Visclosky. Dr. Orbach, I wanted to take this opportunity to commend you for your efforts as Under Secretary for Science to promote R&D integration across the department. In particular, I was interested to see that your FY 2009 budget included integrated budgets for six key R&D areas including electrical energy storage and carbon dioxide capture and storage.

Could you describe these six areas for us briefly, in layman's terms?

Dr. Orbach. The following six key areas have been selected for enhanced R&D coordination across the department and were included in the FY 2009 budget as integrated budgets.

The first area is related to advanced mathematics for the optimization of complex systems, control theory and risk assessment. Many areas of applied energy research including fossil fuel power generation, nuclear fuel lifecycle, and power grid control involve complex systems with huge numbers of components. Until recently, the most effective way to find the best allocation of these components—where best to place electrical substations and transmission lines, and how to operate those lines, for example—was by expert design combined with trial-and-error. We'd like to be able to [ask OE for specific example of what they'd like to be able to do]. We now have the computing technology to fully simulate these complex systems and the Advanced Mathematics research supports those simulation efforts.

The second area is related to the development of options for the storage of electrical energy. Storing electrical energy is a major hurdle in developing renewable energy technologies like wind, solar and wave energy, as well as vehicle technologies like hybrid and electric cars. Incremental advances over current electricity storage methods will not do. We need strong advances in our basic science understanding of the physical and chemical properties of batteries, fuel cells, and supercapacitors to develop cost-competitive electrical storage solutions that are light-weight and compact.

Capturing and storing carbon dioxide gas produced at fossil fuel power plants is vital to mitigate the climate impacts of our electricity use and is our third key R&D focus. The various methods currently being considered include deep underground storage, terrestrial and marine storage. Basic science research is required to understand how the various storage options can best be monitored and controlled, and how to design the next generation of fossil fuel power plants to take advantage of their properties. The sciences involve geological, chemical, and biological properties.

The fourth key R&D area is related to the characterization of radioactive waste. There are critical unanswered scientific questions that must be addressed to facilitate the stabilization, long-term storage, treatment, and ultimate disposal of radioactive waste. The chemistry underlying these wastes is extremely complex and separations processes designed to split the highly problematic fractions of the waste from other portions is

poorly understood. Many of these wastes are merely prepared for long-term stabilization at this time. Significant cost savings will only be made possible through improved scientific understanding of these complex chemical interactions.

Another key R&D area for Science is the ability to predict high level waste system performance over extreme time horizons. Predicting the performance of combined engineered and natural containment barriers over tens of thousands or even a million years is a challenging task. It is entirely possible, however, to design for such long time horizons if conservative assumptions are made at each step of the way. There may be opportunities to apply areas of science to reduce the uncertainty associated with the full system performance. This could translate into approaches that are less costly.

Finally, the sixth area is related to high energy density laboratory plasmas. From nuclear physics to stockpile stewardship and fusion energy sciences, understanding of high energy density laboratory plasmas is a critical component. Although the NNSA has maintained computational capabilities supporting high energy density physics, there is no longer an underground testing component to validate predictive models. Over the years, SC has been scaling back investments resulting in a loss of critical capability and the lack of a coherent, mutually supportive DOE program. SC needs to re-engage and help form the basis for an integrated departmental program which may help leverage scientific cooperation and expertise from abroad.

Chairman Visclosky. How did you select these particular areas to focus on?

Dr. Orbach. Under the Energy Policy Act of 2005, the Office of Science, in close cooperation with the applied programs and the DOE corporate staff developed the *DOE Strategic Research Portfolio Analysis and Coordination Plan* which outlined twenty-one priority research areas that could benefit from research integration. Out of these twenty-one areas, six were agreed upon and selected for more concentrated work and cooperative efforts. These six areas were identified as high priority basic research areas necessary for improved understanding and revolutionary breakthroughs which led to development of the integrated budgets presented in the President's FY 2009 budget request.

Chairman Visclosky. Is there a plan to continue tracking these areas in future budget submissions, or expanding the integration activities to include other areas?

Dr. Orbach. Yes. The Office of the Under Secretary for Science has a plan to track these areas. As we develop the mechanisms to accelerate these priority research areas, the integration activities may be expanded to include additional areas.

R&D INTEGRATION

Chairman Visclosky. Are these six areas part of the proposals for your Energy Frontier Research Centers?

Dr. Orbach. Six specific topical areas highlighted in the Department's FY 2009 budget request for enhanced R&D coordination: an advanced mathematics for optimization of complex systems, control theory and risk assessment; electrical energy storage; carbon dioxide capture and storage; characterization of radioactive waste; predicting high level waste system performance over extreme time horizons; and high energy density laboratory plasmas. The EFRCs will address energy and science "grand challenges" in a broad range of research areas; these "grand challenges" have been defined through a series of more than one dozen workshops conducted over the past five years. Included in that broad scope are four of the six integration areas: electrical energy storage; carbon dioxide capture and storage; characterization of radioactive waste; and predicting high level waste system performance over extreme time horizons. The other two areas, high energy density laboratory plasmas and advanced mathematics for optimization of complex systems, control theory and risk assessment are not in the scope of the BES program that funds the EFRCs, but are different Office of Science coordination activities within the Fusion Energy Sciences and the Advanced Scientific Computing Research programs, respectively.

R&D INTEGRATION

Chairman Visclosky. Dr. Orbach, as the Under Secretary for Science, you are the chief scientist for the Department of Energy. In particular, you are tasked with providing the Secretary with advice on scientific issues of relevance across the department, not just those important to the Office of Science. The Committee would like to explore your activities in this role.

Can you provide a description of some of the broader scientific and technical issues extending beyond the realm of the Office of Science which the Secretary has asked for your advice?

Dr. Orbach. Let me give you a few examples. One area in which the Secretary has asked for my advice is the annual assessment and certification of the U.S. nuclear weapons stockpile. Starting in the summer of 2006, I conducted a series of reviews of the scientific and technical approaches at the three National Nuclear Security Administration (NNSA) laboratories in their annual assessments of the stockpile, with a particular focus on Quantification of Margins and Uncertainties (QMU). Working closely with technical staff at Lawrence Livermore National Laboratory (LLNL), I have employed calculations done by them to systematically explore the underlying statistical features of QMU, as applied to the nuclear-explosive portion of one warhead type. In several respects, the results of these studies corroborate findings obtained in the LLNL assessment of that warhead type and they provide the Secretary with an additional technical view on the assessment and certification process. Extension of my analysis approach to a second warhead type is underway and will be complete in time for use in the coming assessment and certification cycle.

Another area is improving the Department's efforts in carbon sequestration. Advances in basic science have enormous potential to improve progress towards the mission goals of the Office of Fossil Energy (FE) with respect to geological carbon sequestration. As Under Secretary, I requested that the Office of Science (SC) technical staff work with FE in developing a Science Protocol to help define the scientific and technical objectives of the Clean Coal/Carbon Sequestration program. This has been implemented through joint SC-FE conference calls over the past year and contractors' meetings in August and December of 2007 and in March of 2008. The outcomes include a plan to increase awareness and communication between researchers supported by SC and the Regional Carbon Sequestration Partnerships supported by FE and better coordination of the Department's investments in this area.

A third example is the area of technology transfer. In 2007, the Secretary designated me, as the orders Under Secretary for Science, as DOE's Technology Transfer Coordinator to assess the Department's technology transfer efforts and develop a mechanism to oversee and advise the secretary on all technology transfer and commercialization activities performed by DOE National Laboratories and other DOE facilities. A Technology Transfer Policy Board was established to assess the Department's activities. At my request the board developed a technology transfer policy proposal for the Secretary that

would guide and strengthen the Department's efforts. The Secretary issued the Technology Transfer Policy Statement on February 8, 2008.

Chairman Visclosky. In your tenure as Under Secretary, what have you learned about the health of the applied science efforts in the energy technology programs as well as in the NNSA?

Dr. Orbach. The applied technology programs have had greater difficulty in executing long-term applied technology research efforts. With significant proportions of their funding committed to demonstration projects and deployment of technologies, in my opinion, they are challenged to dedicate adequate resources to necessary longer term applied research that will bring new discoveries and concepts into the development of advanced technologies. I have been working closely with the Under Secretary for Energy and the NNSA Administrator to develop greater cooperation across the basic and applied programs and to identify priority, long term applied science efforts that should be considered for enhanced investment by the applied technology programs.

Chairman Visclosky. Can you provide examples of specific instances where your role as Under Secretary has enabled you to bridge the divide between the Office of Science and the applied technology programs?

Dr. Orbach. One of the first things I did as Under Secretary was conduct a series of program office reviews with the applied technology programs to understand their mission priorities and identify areas of research where enhanced coordination between the basic and applied programs could accelerate progress toward program and mission goals. The *DOE Strategic Research Portfolio Analysis and Coordination Plan* submitted to Congress in July 2006, outlined 21 such research areas. These areas are in addition to the areas the Department has been coordinating across programs for several years such as solar, hydrogen, and advanced nuclear energy systems. For the FY 2009 internal DOE budget process, which began in late 2006 and early 2007, I called for the establishment of a working group consisting of technical staff of the applied technology programs and basic science programs in the Office of Science to select several of the 21 research areas for enhanced program coordination and coordinated funding investments in FY 2009. Six of those areas are identified and highlighted in the FY 2009 DOE budget request and were discussed earlier. Research priorities in these areas were identified in a series of scientific workshops organized by the Office of Science with participation by the broader scientific community and the DOE technology programs.

Chairman Visclosky. Have you established a systematic, ongoing process for identifying opportunities for improving R&D integration and coordination between programs?

Dr. Orbach. The Department established a Science and Technology (S&T) Council in 2006, consisting of the Under Secretary for Science, the Under Secretary for Energy, and the Administrator of NNSA, which meets frequently to discuss issues of importance across the organization, including R&D coordination. The working group mentioned

above that was established for R&D coordination is becoming an integral part of the annual budget planning process and receives guidance from the S&T Council, including identifying new opportunities for coordination. Department-sponsored scientific workshops that involve broad participation of the scientific and technical communities also continue to be used as successful mechanisms for identifying research opportunities for both the basic and applied research programs and areas that could benefit from better coordinated efforts.

Chairman Visclosky. How is this manifested in the proposed FY 2009 budget?

Dr. Orbach. Six new areas are highlighted in the FY 2009 budget request for enhanced R&D coordination. One or more applied technology programs and the Office of Science have highlighted proposed investments. These six areas are electrical energy storage; carbon dioxide capture and storage; characterization of radioactive waste; advanced mathematics for optimizing of complex systems, control theory, and risk assessment; predicting high level waste system performance over extreme time horizons; and high energy density laboratory plasmas.

Chairman Visclosky. Have you established a systematic, department-wide process for identifying gaps in the R&D portfolio associated with the "valley of death" between the basic science and applied technology programs where good basic research ideas never get picked up by the applied programs and go to die, or where basic research needs of the applied programs get left behind due to lack of support or interest from the basic science programs?

Dr. Orbach. The Department's ongoing efforts to identify and address priority research needs that fall between basic and applied research include the DOE scientific and technical workshops and the basic and applied R&D coordination working group efforts, as well as other Federal and DOE laboratory working groups organized by the S&T Council.

Over 20 scientific workshops in the past six years have been conducted by the Office of Science, in consultation with the DOE applied technology programs and NNSA. The purpose of these workshops is to bring together science and technology experts from academia, government and the private sector to identify priority research areas in discovery and use-inspired basic research as well as longer-term applied research. The priority research areas identified have the greatest potential for overcoming the scientific and technical obstacles to advancing various energy technologies.

The R&D coordination working group, which was established to develop proposals for enhanced coordination as part of the annual budget process, provides one of the most effective processes for bridging research gaps between the basic and applied programs. The program managers who participate in this working group are the technical experts of their respective programs. They are best equipped to identify research needs that span basic and applied research and to develop a coordinated plan that involves effort and investment for both basic and applied research programs, consistent with respective

program missions and budgets. This group also considers whether there are new areas of research coordination, including those not previously identified in the *DOE Strategic Research Portfolio Analysis and Coordination Plan*. The S&T Council periodically requests expert opinion from the DOE laboratories through laboratory working groups consisting of their leading technology experts. These working groups are tasked with identifying research needs and research portfolio gaps for particular energy technology areas and providing an alternative perspective.

The basic research programs in the Office of Science and DOE applied technology programs also facilitate the bridging of the basic and applied research by holding joint grantee and contractor meetings. These meetings promote communication between researchers and technology developers to stimulate the sharing of ideas and collaboration and bridge gaps in the research continuum. The technology transfer efforts by the Department and the Secretary's technology transfer policy statement guide encourage the DOE laboratories to build and enhance their processes for transferring knowledge, intellectual property, and capabilities to meet public and private needs. I consider the issue of bridging basic and applied technology research within the scope of this effort at the laboratories and complementary to efforts of the Department to support R&D partnerships with industry.

The Department's Small Business Innovation Research (SBIR) program also provides a mechanism for the research community to bridge basic and applied research for the development of new technologies. For example, SBIR support by the Office of Science for fundamental studies of the electronic conductivity of lithium iron phosphate demonstrated induced conductivity increases of eight orders of magnitude. This discovery by A123 Systems led to support from the Office of Energy Efficiency and Renewable Energy for development of high power-density lithium-ion batteries. A123 Systems batteries now power vehicles such as the Chevy Volt and Th!nk vehicles.

Chairman Visclosky. Given that this is the last year of this Administration, how are you planning to ensure that R&D coordination is being institutionalized within the department?

Dr. Orbach. Under guidance by the S&T Council, we have developed working groups to help coordinate R&D across the Department as well as program management level groups to coordinate particular scientific and technology goals. It is important that the processes for coordinating R&D across the Department be developed and managed by the technical experts within the respective basic and applied research programs. The joint working groups that have been established have become an integral part of program management and cooperation between basic and applied programs and are involved in the budget planning process. These workgroups are serving to institutionalize R&D coordination within the Department.

ENERGY FRONTIER RESEARCH CENTERS

Chairman Visclosky. Dr. Orbach, as part of your budget request you have proposed a competition to fund several Energy Frontier Research Centers in the Office of Basic Energy Sciences "to accelerate scientific breakthroughs needed to create advanced energy technologies for the 21st century."

Could you describe this proposal in greater detail?

Dr. Orbach. The Energy Frontier Research Centers (EFRCs) are a means to attract the very best scientists and engineers to address our country's energy needs. The magnitude of the funding, and the five year minimum commitments are important aspects of the program. The EFRCs will address energy and science "grand challenges" in a broad range of research areas; these "grand challenges" have been defined through a series of more than one dozen workshops conducted over the past five years. EFRC proposals will be solicited through a Funding Opportunity Announcement (FOA). This will provide an open competition among all researchers for the very best ideas to address the fundamental questions of how nature works and to help solve some of our most critical real-world challenges. The selection of the initial 20 to 30 awards in FY 2009 will depend on the quality of the proposals received and the peer review outcomes of the FOA competition.

Chairman Visclosky. The proposal calls for funding these centers at $100 million per year from the budget of the Office of Basic Energy Sciences - how will this request impact other research and facilities supported by the office?

Dr. Orbach. The Energy Frontier Research Centers (EFRCs) will be initiated with a portion of the requested funding increase for Basic Energy Sciences (BES) in FY 2009. The creation of the EFRCs will expand and complement the research and facilities supported by BES. After the $100 million is awarded, the funding for the EFRCs will represent about 15 percent of the total funding for research in the BES program. EFRCs are also encouraged to use and leverage existing facilities, including the major Office of Science user facilities.

Chairman Visclosky. Since much of this funding was intended to support the research envisioned for these centers anyway, what value is added by the centers themselves? Will this funding be only for research or can it also be used for new buildings and facilities?

Dr. Orbach. The Energy Frontier Research Centers (EFRCs) program will provide substantial, long-term support for 20 to 30 groups of multiple investigators in a dynamic research environment necessary to inspire, train, and support scientists of the future who will have an appreciation for global energy challenges. This method of implementation is more focused on long-term energy research opportunities than funding hundreds of individual investigators. Furthermore, each EFRC will define a clear management plan for the establishment and nurturing of synergy among the EFRC investigators so that the impact of the ERFC is substantially greater than the sum of its parts. Funding will be for

research, including instrumentation; however, new buildings will not be part of the awards. Usage and leverage of existing facilities, including the Basic Energy Sciences user facilities, is encouraged.

Chairman Visclosky. The proposed funding for each of the centers will be quite small- just $2-5 million annually. Is this really enough to have a substantial impact?

Dr. Orbach. Typical individual investigator awards in Basic Energy Sciences are $100,000 to $300,000 annually over three years. Energy Frontier Research Center (EFRC) awards are expected to be in the $2 to $5 million range annually for a five-year period. This additional commitment of funds and duration-of-effort will permit an EFRC to achieve a critical mass of researchers and students having a diverse range of experience, skills, and talents. The request supports 20 to 30 EFRCs at universities and DOE laboratories across the Nation, which will result in significant changes in the way we solve energy production, conversion, transmission, storage, and waste mitigation challenges.

Chairman Visclosky. The Committee strongly endorses the open, competitive model being proposed for these centers, which will feature head-to-head competition between national labs and universities to ensure that the best proposals will be funded regardless of the affiliation of the researchers involved. However, I am concerned that smaller universities may be at a disadvantage in competing for these centers as compared to the individual grants these centers would replace - how would you address this issue?

Dr. Orbach. All universities, even the smaller ones throughout the U.S., have areas of special strengths; these might be in catalysis or plant sciences or aspects of materials sciences. These areas of strength, or core competence, make their university extremely competitive. The beauty of the EFRCs is that it allows universities to capitalize on such areas of core competency. I would also like to point out that only a portion of the increase for research in the Basic Energy Sciences program is devoted to EFRCs. Another portion ($60 million) of the increase will be for individual investigator awards. The EFRCs will represent about 15 percent of the total funding for research in the BES program in FY 2009.

Chairman Visclosky. Dr. Orbach, to what extent are such competitive models utilized throughout your Office, and do you see impediments to expanding it?

Dr. Orbach. The Office of Science (SC) has utilized the Funding Opportunity Announcement for open and fair competition among universities, national labs, and nonprofit and for-profit entities for the Biological and Environmental Research GTL Bioenergy Centers and now for the Basic Energy Sciences Energy Frontier Research Centers. It has proven to be an effective way of providing a level playing field, and I see no impediment to expanding it in SC.

Chairman Visclosky. Will the private sector also be given the chance to compete for these centers?

Dr. Orbach. Yes, nonprofit and for-profit private entities are eligible to apply under the EFRC Funding Opportunity Announcement.

Chairman Visclosky. What is your plan in the out-years for these centers?

Dr. Orbach. The plan for the outyears will depend on the success of the centers. Funding is committed for five years, with reviews at about three years. As the Energy Frontier Research Center program matures, it is anticipated that EFRC competitions will be held every few years and that renewal submissions will be openly competed with new proposals. Outyear funding is subject to satisfactory progress in the research and the availability of funding appropriations.

Chairman Visclosky. As some of the topics of research proposed for the Energy Frontier Research Centers are closely related to technology R&D areas pursued by the energy technology programs (such as solar energy utilization and geosciences for carbon dioxide storage), have you coordinated these centers with the energy technology programs? If not, do you have plans to do so?

Dr. Orbach. The EFRC program focus areas were formulated based on the series of eleven Basic Research Needs workshops conducted over a five-year period. These workshops were organized and run by the Office of Science in cooperation with DOE energy technology programs. The Department is committed to continuing and improving coordination between our basic and applied energy research programs.

ENERGY FRONTIER RESEARCH CENTERS

Chairman Visclosky. It would seem that the Energy Frontier Research Centers would be even more effective if they were part of a larger, integrated and focused research, development, and deployment effort across the department - essentially, what has been envisioned for ARPA-E - so why not just create ARPA-E instead?

Dr. Orbach. The Energy Frontier Research Centers (EFRCs) represent 15 percent of the total BES funding for research; the success of the EFRCs depends critically upon their integration with the core research programs. Likewise the Bioenergy Research Centers draw from the success of the Genomics: GTL program. The management of both the EFRCs and the Bioenergy Research Centers actively integrates the Centers with the core research programs from which they grew.

Placing these activities within an ARPA-E structure is not only unnecessary, it would be counterproductive.

President Bush signed the America COMPETES Act into law on August 9, 2007. In a statement released after the signing, the White House noted that the COMPETES Act in many ways supports the aims of the President's American Competitiveness Initiative (ACI). However, the President noted that the Administration would not request funding for all authorizations in the Act, including ARPA-E.

However, recognizing the intent of Congress in passing ARPA-E, the Secretary asked the three Under Secretaries, including myself, and the Chief Financial Officer to review the ARPA-E statute and its directives, and to examine other possible options for implementation, given current funding constraints.

We are examining the integration of the goals and mission of ARPA-E with the goals and missions of existing programs of the Department, as appropriate. These efforts are well under way and are addressing the goals set for ARPA-E in the COMPETES Act. These goals are identifying and promoting revolutionary advances in fundamental sciences; translating scientific discoveries and cutting-edge inventions into technological innovations; and accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.

For example, we are reviewing how ARPA-E relates to such already existing commercialization programs as the Small Business Innovation Research/Small Business Technology Transfer Research (SBIR/STTR) program, and we are considering how our current technology transfer activities could best be used to meet the goals set out for ARPA-E.

On June 29, 2007, as under Secretary for Science, I was appointed the Technology Transfer Coordinator, in accordance with the provisions in the Energy Policy Act of 2005, and among my first actions was to establish a Technology Transfer Policy Board comprised of senior career officials from affected Programs across the Department,

including the NNSA. This Technology Transfer Policy Board has been working for almost a year now on simplifying and streamlining technology transfer mechanisms at DOE facilities. Board members are exploring ways to promote more uniform practices among DOE's facilities. This should eliminate a significant impediment to private sector partnering by addressing a major partner complaint: confusion caused in dealing with all the different partnering practices at the various DOE facilities.

The Secretary recently issued a issued Policy Statement on Technology Transfer at DOE Facilities designed to help guide and strengthen the Department's technology transfer efforts and to heighten awareness of the importance of technology transfer activities throughout DOE. This Policy Statement builds upon the stimulus provided by the technology transfer provisions contained in the Energy Policy Act of 2005 and other recent legislation like the "America COMPETES Act" that seek to improve the transfer of energy technologies from the Department's facilities to the commercial marketplace.

My office is also examining the more than $500 million per year spent to provide matching funds with private partners to promote promising energy technologies for commercial purposes. This, combined with reviews of all technology activities across the Department for the purpose of better coordination between the basic and applied programs, will help us meet most of ARPA-E's goals.

The EFRCs and the Bioenergy Research Centers that preceded them are examples of the Office of Science's using the authorities granted it to create non-traditional, nimble, well-reasoned, and well-funded basic research institutions. I believe that these and other changes mentioned above that are being implemented within the Department fully address the goals and the spirit of the COMPETES Act as well as the Energy Policy Act of 2005. We particularly want to avoid creating a new overlapping bureaucracy that would duplicate existing activities and consume critical resources without necessarily adding commensurate value.

ENERGY FRONTIER RESEARCH CENTERS

Chairman Visclosky. What will be done to ensure that the results of the research carried out at these centers will be transferred effectively to domestic industry, leading to high paying, high tech domestic jobs and capacity rather than having them go abroad, as was the case with battery research over the last two decades?

Dr. Orbach. The Office of Science will continue to work with DOE energy technology programs to ensure that knowledge gained in the basic research program will be effectively communicated to applied technology programs for developing technology transfer to domestic industry. There have been many cases exemplifying the success in translating basic research discovery to technology breakthroughs that validate the importance of long-term, broad-based fundamental research in developing competitive, domestic industry based on world-leading technologies. Here is one example in which Office of Science research addressed a critical challenge facing the economically viable production of ethanol from biomass: a lack of bio-organisms that can ferment the multiple types of sugar found in biomass. The Office of Science supported research in the early 1990s on fundamental genetic studies that lead to the creation of bio-organisms that not only fermented a wide range of sugars, but also could tolerate high concentrations of ethanol. In the late 1990's, EERE provided additional support to carry this research toward commercially viable technology. That effort was successful, as these organisms became a cornerstone for a cellulosic ethanol start-up venture, known as Celunol Corporation. In June 2007, Celunol merged with Diversa Corporation, a global leader in enzyme technology, to form Verenium Corporation—now a chief developer of biofuels.

Basic research funded by the Office of Science can serve to transfer knowledge to existing industries; however, SC basic research also helps establish entirely new companies by creating innovative, research-based technologies. For example sustained basic research in ceramic nanomaterials has led to the new lithium phosphate battery technology of A123Systems of Watertown, Massachusetts with much higher power densities over traditional batteries. Within the last 3 years these new batteries have reached the commercial marketplace in power tools produced by North America's largest toolmaker, Black and Decker, and they currently are being implemented in hybrid and plug-in hybrid electric vehicles, amongst other applications. In early August 2007, A123Systems and General Motors (GM) announced the co-development of A123System's nanophosphate battery for use in GM's electric drive E-Flex system. The joint effort is expected to expedite the development of the batteries for both electric plug-in hybrid vehicles and fuel cell-based vehicles. This success not only illustrates a success story in translating basic research discovery into technology breakthroughs, it further validates the critical importance of long-term, broad-based fundamental research in paving the knowledge foundations for the next generation of energy technologies. Technology transfer is best accomplished by people—and SC supports the training of a great number of students and researchers by funding their experiments and their use of SC major user facilities such as light sources, neutron sources, Nanoscale Science Research Centers, and supercomputers.

The proposed Energy Frontier Research Center program will follow these successful examples to address some of our most critical real-world energy challenges by tapping the imagination, creativity, and knowledge of the scientific community and by pushing the frontiers of science. A sound federal strategy for not losing the results of scientific research and technologies abroad includes keeping researchers and their students in the U.S. through long-term support for high-quality basic research programs so that the knowledge generated can be transmitted to applied research programs for technology transfer.

QUESTIONS FROM CONGRESSMAN HOBSON

ENERGY FRONTIER RESEARCH CENTERS

Mr. Hobson. Please explain the mechanism you will use to conduct a single competition — between universities, national labs, and private companies — for your proposed Energy Frontier Research Centers.

Dr. Orbach. The Energy Frontier Research Centers will be competed under a Funding Opportunity Announcement (FOA). Eligible applicants are defined in Section 989 of EPAct 2005 and include: institutions of higher learning, national laboratories, nonprofit and for-profit private entities, state and local governments, and consortia of these entities

Mr. Hobson. Who will evaluate the proposals you receive for these Energy Frontier Research Centers? In order to avoid a conflict of interest, will the laboratories be excluded from this peer review process?

Dr. Orbach. Review of Energy Frontier Research Center proposals will follow a strict set of merit review guidelines defined in the Funding Opportunity Announcement and in a Merit Review Plan. All scientists participating in the merit review must sign a conflict of interest/non-disclosure agreement prior to participating in the merit review process. Conflicts of interest generally fall into two broad categories, which are an affiliation with an applicant institution and a professional or personal relationship with an investigator on a proposal. Scientists from DOE national laboratories will not be automatically excluded from the merit review process, but they must abide by the conflict-of-interest guidelines and are required to disclose any potential conflict of interest to DOE program officials responsible for the merit review process.

QUESTIONS FROM CONGRESSMAN CALVERT

ENERGY FRONTIER RESEARCH CENTERS

Mr. Calvert. We all agree that technological development is needed to help us address the energy challenge - no question. The Office of Science certainly seems to be addressing this critical issue and toward that end, the FY09 budget request for the Office of Science includes the new Energy Frontier Research Centers program.

Although again we can agree that this research is critical, how is this program actually going to work?

Dr. Orbach. The Energy Frontier Research Centers (EFRCs) will address energy and science "grand challenges" in a broad range of research areas; these "grand challenges" have been defined through a series of more than one dozen workshops conducted over the past five years. While the EFRCs are not anticipated to contribute immediately to commercialization of energy technologies, they will address key scientific issues that limit transformational advances needed for future energy technologies. The EFRCs are set up to attract the very best scientists and engineers to address our country's energy needs. The magnitude of the funding and the five year minimum commitment will enable "self assembly" of our finest minds to address fundamental roadblocks to U.S. energy security. EFRC proposals will be solicited through a Funding Opportunity Announcement (FOA). This will provide an open competition among all researchers for the very best ideas to address the fundamental questions of how nature works and to help solve some of our most critical real-world challenges. The selection of the initial expected 20 to 30 awards in FY 2009 will depend on the quality of the proposals received and the peer review outcomes of the FOA competition.

Mr. Calvert. Are there processes planned or in place to ensure that the viable technologies developed will be channeled to the appropriate commercialization pathways in time to make an impact?

Dr. Orbach. The Office of Science will continue to work with DOE energy technology programs to ensure that knowledge gained in the basic research program will be effectively communicated to applied technology programs for developing technology transfer to domestic industry. There are processes in place that have facilitated many successful examples in translating basic research discovery to technology breakthroughs, validating the importance of long-term, broad-based fundamental research in developing competitive, domestic industry based on world-leading technologies. The proposed Energy Frontier Research Center program will follow these successful examples to address some of our most critical real-world energy challenges by tapping the imagination, creativity, and knowledge of the scientific community and by pushing the frontiers of science. A sound federal strategy for not losing the results of scientific research and technologies abroad includes keeping researchers and their students in the U.S. through long-term support for high-quality basic research programs so that the knowledge generated can be transmitted to applied research programs for technology

transfer. This will also ensure the commercialization channels continue to be replenished with world-leading scientific advances. Finally, the EFRC program provides a tremendous opportunity to inspire, train, and support leading scientists of the future who have a deep understanding of the global energy challenges of the 21st century and who provide a trained technical workforce that is capable and eager to translate basic research into transformative energy technologies in the industrial sector.

Mr. Calvert. What is the difference between the work to be funded through the Energy Frontier Research Centers program and the research portfolio of Energy Efficiency and Renewable Energy Office?

Dr. Orbach. The work to be funded through the Energy Frontier Research Centers will focus on establishing the knowledge foundations on how nature works in order to understand and control matter at the quantum, atomic, and molecular levels- the same levels that energy is generated, stored, transfer, and utilized. Such control will lead to the discovery and design of new materials and chemical processes, paving the way for transformational scientific advances and disruptive energy technologies. The research portfolio of the Office of Energy Efficiency and Renewable Energy focuses primarily on taking existing or emerging technology concepts to higher level of performance in meeting technical milestones, with an emphasis on performance, cost reduction, and durability of materials and components, and on efficient, scalable manufacturing processes. The two programs are complementary, and both are needed to address the energy challenges of the 21st century.

ENERGY FRONTIER RESEARCH CENTERS

Mr. Calvert. More generally, how does research in the Office's Basic Energy Research and Biological and Environmental Research programs connect to the Department's technology offices?

Dr. Orbach. In recent years the Office of Science has accomplished, through a series of Basic Research Needs workshops and other workshops led by our science programs, a partnership with the Department's technology programs. These workshops have brought together subject experts with diverse views from the broader basic and applied research community to discuss and identify areas of focus for DOE's basic research efforts. These efforts have enabled the Office of Science to stay informed of research needs and new opportunity areas, as well as scientific and technological roadblocks, and have enabled us to create a prioritized and comprehensive research agenda.

For the Basic Energy Sciences (BES) program, there has been increased coordination and interaction with the technology program offices since the 2003 BES Advisory Committee (BESAC) workshop, *Basic Research Needs to Assure a Secure Energy Future* and the series of ten follow-on "Basic Research Needs" workshops over the next five years. These workshops were organized by BES in coordination with the technology offices including the Office of Energy Efficiency and Renewable Energy, Office of Fossil Energy, Office of Nuclear Energy, Office of Electricity Delivery and Energy Reliability; and the Defense Program in the National Nuclear Security Administration; and covered topics in energy production, conversion, storage, transmission, and waste mitigation. These workshop reports have engaged more than 1,500 participants from universities, industry, and DOE laboratories, and have identified high priority research directions with promise to address the most critical knowledge and technology gaps. Specific workshop topics included the hydrogen economy; solar energy utilization; superconductivity; solid-state lighting; advanced nuclear energy systems; combustion of 21st century transportation fuels; electrical-energy storage; geosciences as it relates to the storage of energy wastes (the long-term storage of both nuclear waste and $CO_2$); materials under extreme environments; and catalysis for energy-related processes. BES has also had major involvement in the Department-wide research and development (R&D) integration activities in the areas of electrical energy storage; carbon dioxide capture and storage; characterization of radioactive waste; and predicting high level waste system performance over extreme time horizons.

For the Biological and Environmental Research (BER) program, the recent and on-going workshops, as well as formal and informal discussions with the technology programs, support the need for additional research emphasis in $CO_2$ capture and storage to benefit the optimization of fossil fuel power generation and the development of carbon neutral fuels. The BER research includes understanding, modeling, and predicting the processes that control the fate of carbon dioxide injected into geologic formations, subsurface carbon storage, and the role of microbes and plants in carbon sequestration in both marine and terrestrial environments. The activities further inform our fundamental research including the GTL research in biofuels and carbon sequestration, the GTL

Bioenergy Research Centers, and Climate Change Research in carbon cycling. These activities support the Offices of Fossil Energy and Energy Efficiency and Renewable Energy (for development of biofuels). Also our Climate Change Research program has been working with Office of Energy Efficiency and Renewable Energy's wind energy program to identify potential research needs related to climate change and wind energy resources.

Furthermore, other workshops support the need for additional research emphasis in the characterization of radiological waste to address critical unanswered scientific questions to facilitate the stabilization, long-term storage, treatment, and ultimate disposal of radioactive waste. The BER research effort addresses processes that control the mobility of radiological waste in the environment. This research will increase the likelihood for success in DOE strategic initiatives for clean up of legacy nuclear wastes and nuclear energy applications, benefiting the Offices of Environmental Management, Civilian Radioactive Waste Management, Legacy Management, and Nuclear Energy.

QUESTIONS FROM CHAIRMAN VISCLOSKY

CONGRESSIONAL DIRECTION

Chairman Visclosky. When the Secretary testified before this Subcommittee last week, we confronted him on the Department's failure to follow Congressional direction. You are about to share in some of that experience.

Do you view report language as binding on your office, or merely advisory and something that the Department has the discretion to ignore? Please don't make the mistake that our DOE witnesses earlier this week made, and say that question would have to be answered by the General Counsel. I want to know what YOU think and how you treat report language in the Office of Science.

Dr. Orbach. While report language does not bear the force of law, we regard it as very important request. We seek to take all steps as appropriate to comply with this Congressional request.

Chairman Visclosky. Do you believe you are complying 100 percent with the directives Congress has given to your office?

Dr. Orbach. We have one pending reprogramming request with your committee that seeks a variance from funding direction in the explanatory statement accompanying the 2008 Consolidated Appropriations Act. Pending approval of this request, we are remaining consistent with Congressional direction. There are two overdue reports that are being reviewed within the Department and we hope to deliver to you soon. One of the reports is related to an inventory of legacy radioactive contamination at Argonne National Laboratory and the other is on Scientific Coordination between the Office of Science and the Energy programs. I believe we are in compliance with all other 2008 guidance for the Office of Science.

Chairman Visclosky. Please provide for the record a report identifying all of the directives to your office contained in the separate House and Senate reports for FY 2008, as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act for FY 2008, and documenting the status of your compliance with those directives.

Dr. Orbach. Following is a table that contains our assessment of the Congressional requests for the Office of Science from the House and Senate reports for FY 2008 as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act for FY 2008, including their respective status regarding our compliance with those requests.

| Congressional Requests | Status |
|---|---|
| SC – Scientific Cooperation: Report supported by Office of Science and Office of Energy Supply and Conservation regarding specific steps DOE is taking to ensure cooperation between these two offices in identifying broad research objectives and goals as well as specific R&D priorities required in the short term. Report should contain information as to how various DOE labs are supporting these activities and budget projections in next 5 years. Due **concurrent with FY 2009 budget submission**. (S. 1751 / Rpt. 110–127 Rpt. p. 143) | In department review. |
| SC - Science Labs Infrastructure: Prepare inventory of legacy radioactive contamination at Argonne National Laboratory, including determination of parent programs responsible for such contamination, so that Committee can apportion remediation costs fairly. Due no later than **11-30-07**. (H.R. 2641 / Rpt. 110–185 Rpt. p. 86) | In department review. |
| SC - Energy R&D. Disturbed by lack of energy R&D coordination across Office of Science, applied energy programs (EERE, NE, FE, and OE), and extensive funding through LDRD. Establish effective coordination mechanism across these research efforts. (H.R. 2641/Rpt. 110–185 Rpt. p. 81) | Underway. |
| SC - High Energy Physics. The Department is directed to proceed jointly with NASA to conduct and complete an open, competitive selection of the science investigation and payload for the Joint Dark Energy Mission (JDEM) during 2008. This selection should use the NASA Announcement of Opportunity process and have as its primary science selection criterion the achievement of improved understanding of dark energy and include improved understanding in astrophysics generally as a secondary criterion. The selection should be made jointly by NASA and DOE. If DOE and NASA cannot agree on a joint approach for mission implementation, DOE should provide no future year support for this activity or for other space science satellite missions (H.R. 2764 / P.L. 116–161 Rpt p.574) | Underway. |
| SC - High Energy Physics. The Department is directed to continue support for the Super Nova Acceleration Probe during fiscal year 2008. (H.R. 2764 / P.L. 116–161 Rpt. p. 575) | Underway. |
| SC - Biological Research. All of added funds must be awarded competitively in solicitations that include all sources—universities, private sector, and government labs—on an equal basis. (H.R. 2764/P.L. 116–161 Rpt. p. 575) | Underway. |
| SC - Biological and Environmental Research. The Department is directed to request funds for Biological Research and Climate Change Research as separate subaccounts in fiscal year 2009 and future fiscal years. (H.R. 2764 / P.L. 116–161 Rpt. p.575 ) | Complete. |
| SC - Fusion Energy Sciences. $93.5M for U.S. Facility Operations, and increase of $6M to be used to increase facility operations at the three U.S. user facilities (DIII-D, Alcator C-Mod, and National Spherical Torus Experiment). (H.R. 2764 / P.L. 116–161 Rpt. p. 576) | Complete. |

| Congressional Requests | Status |
|---|---|
| SC - Fusion Energy Sciences. Funding may not be reprogrammed from other activities within Fusion Energy Sciences to restore the U.S. contribution to ITER. (H.R. 2764 / P.L. 116–161 Rpt. p. 576) | Complete. (The Department submitted a reprogramming proposal on 3/4/2008 to reallocate within the ITER funding total.) |
| SC - Science Laboratories Infrastructure. Within Science Laboratories Infrastructure, $1.52M is provided to continue payments in lieu of taxes for Argonne and Brookhaven National Laboratories. (H.R. 2764/P.L. 116–161 Rpt. p. 576) | Complete. |
| SC - Science Laboratories Infrastructure. The Department is directed to increase the future year funding contribution of the Office of Science for [the Physical Sciences Facility at Pacific Northwest National Laboratory] facility by $10M to restore the baseline funding contribution from the Office of Science. To keep this project on schedule $25M is included in Defense Nuclear Nonproliferation. (H.R. 2764 / P.L. 116–161 Rpt. p. 576) | Underway. |
| SC - Science Laboratories Infrastructure. The Department is directed to use the existing $2M of PED funding, plus the requested construction funding under the MEL-001 infrastructure project, for the design and construction of a new multipurpose laboratory to replace 4500N. (H.R. 2764 / P.L. 116–161 Rpt. p. 576) | Underway. |
| SC - Advanced Scientific Computing. The Office of Science and NNSA are directed to establish the Institute for Advanced Architectures and Algorithms with Centers of Excellence at Sandia National Laboratories and Oak Ridge National Laboratory. These Centers will execute a national program involving industry, universities and national laboratories that is focused on technologies to sustain the U.S. leadership in high performance computing. The NNSA ASC and Office of Science ASCR programs will jointly fund the program and provide direction needed to support the goal of developing exascale computing for the Nation. (H.R. 2764 / P.L. 116–161 Rpt. p. 576) | Underway. |

CONGRESSIONAL DIRECTION

Chairman Visclosky. Please provide this Subcommittee a detailed report documenting the execution status for all of the earmarked projects in the Science account contained in the explanatory statement accompanying the Consolidated Appropriations Act for Fiscal Year. If you have not provided funding yet, identify the contacts made to date and when you anticipate providing that funding to the recipients.

Dr. Orbach. The earmarks are listed in a table that I would like to insert for the record. The table shows the title of each earmark that was in the Congressional direction accompanying the FY 2008 Consolidated Appropriations Act for the Office of Science. The net amount for each earmarked activity to be provided after applicable SBIR/STTR and mandated FY 2008 rescission reductions is listed in the table. Office of Science staff have contacted the recipients of these earmarks, and requested the information on the nature of work to be conducted including a detailed description for construction/equipment projects and applications for research projects. A grant award could be anticipated approximately six months after DOE receipt of information on construction/equipment projects, and two months after the receipt of formal application for research projects. Applications will be processed as they are received for the award of funds to each earmark recipient. The information follows:

FY 2008 CONGRESSIONALLY DIRECTED PROJECTS

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| **Alabama Projects** | | | |
| AAMURI Integrated Environmental Research and Services | 479 | No | |
| USA Cancer Institute Oncology Medical Record System | 479 | Initial Information | Construction |
| **California Projects** | | | |
| Harney Science Center Equipment | 479 | Initial Information | Construction |
| Loma Linda University Medical College Radiation Protection Program | 1,913 | Initial Information | Construction |
| The Methanol Economy | 1,913 | Initial Information | Research |
| U. of California, Los Angeles for the Institute for Molecular Medicine Radiation Research | 5,738 | No | |
| U. of California, San Diego to Support Seismic Research | 1,913 | Initial Information | Construction |
| **Colorado Projects** | | | |
| Northern Hemisphere Pierre Auger Observatory in Colorado for the Northern Hemisphere Location of a Particle Detection Observatory | 956 | Initial Information | Research |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| Sustainable Biofuels Development Center | 334 | Initial Information | Research |
| Ultra-dense Supercomputing Memory Storage in Colorado for Further Research in this Field | 956 | Formal Application | Research |
| **Florida Projects** | | | |
| Eckerd College Science Center | 1,913 | No | |
| Institute for Collaborative Sciences Research | 383 | Initial Information | Construction |
| Jacksonville University Marine Science Research Institute | 479 | No | |
| Phase II Design and Const. of Sage Hall Science | 479 | Initial Information | Construction |
| St. Thomas University - CORTE | 239 | Initial Information | Construction |
| Technology for print disabled students | 1,147 | No | |
| **Illinois Projects** | | | |
| Chicago Public Schools Science Laboratory Enhancement | 956 | Initial Information | Research |
| Chicago State University Research | 956 | Initial Information | Construction |
| DePaul University Interdisciplinary Science and Technology | 239 | Initial Information | Construction |
| Dominican University in River Forest, Illinois for Research Related to the Role of Transglutaminases in Alzheimer's and Huntington's Diseases | 573 | No | |
| Geothermal System at Sherman Hospital in Elgin, IL | 956 | Initial Information | Construction |
| Green Building Technologies for Lakeview Museum | 191 | Initial Information | Construction |
| Memorial Health System, Springfield, Illinois | 479 | Initial Information | Construction |
| Nanotechnology Research Internships in Illinois | 479 | Initial Information | Research |
| Neuroscience Laboratory, Dominican University | 287 | Initial Information | Construction |
| Perry Memorial Hospital PACS System | 334 | Initial Information | Construction |
| Roosevelt University Biology Laboratory Equipment | 670 | Initial Information | Construction |
| U. of Chicago to Research Multi-Modality, Image-Based Markers for Assessing Breast Density & Structure to Determine Risk of Breast Cancer | 573 | Formal Application | Research |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| **Indiana Projects** | | | |
| Indiana Wesleyan University School of Nursing | 239 | No | |
| Notre Dame Innovation Park | 750 | Initial Information | Construction |
| Purdue Technology Center | 1,913 | Initial Information | Construction |
| U. of Saint Francis Science Center | 689 | Initial Information | Construction |
| U. of Southern Indiana Engineering Equipment | 717 | No | |
| **Iowa Projects** | | | |
| Coe College Scientific Instrumentation | 861 | Initial Information | Construction |
| Luther College Science Building renovation project | 717 | Initial Information | Construction |
| U. of Dubuque, Environmental Science Center | 956 | No | |
| **Kansas Project** | | | |
| KUMC Tele-Oncology Network | 287 | Initial Information | Construction |
| **Kentucky Projects** | | | |
| Eastern Kentucky University Chemical Research Instrumentation | 144 | No | |
| Louisville Science Center | 144 | Initial Information | Construction |
| Pikeville Medical Center, Kentucky | 479 | Initial Information | Construction |
| U. of Louisville Regional NMR Facility in Louisville, Kentucky, to Support Ongoing Research in Fundamental Processes of Electron Transport Systems and the Structural Biology of Proteins | 956 | No | |
| **Louisiana Projects** | | | |
| Louisiana Tech University in Ruston, Louisiana, for Research in Nanotechnology | 1,435 | Formal Application | Research |
| Tulane Materials and Energy Research | 1,147 | Initial Information | Construction |
| **Maine Projects** | | | |
| Gulf of Maine Research Institute lab upgrades | 717 | Initial Information | Construction |
| U. of Maine in Orono, Maine, for Research in Integrated Forest Products Refinery Technology | 956 | Initial Information | Research |
| **Maryland Projects** | | | |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| Center for Nanomedicine at the University of Maryland in Baltimore to Support Research into New Nanoconstructs | 239 | No | |
| Germantown Biotechnology Project | 1,435 | Initial Information | Construction |
| **Massachusetts Projects** | | | |
| Berkshire Environmental Resources Center | 239 | Initial Information | Research |
| Boston College Institute for Integrated Sciences | 956 | No | |
| Emmanuel College Center for Science Partnership | 479 | Initial Information | Construction |
| Pioneer Valley Life Sciences Initiative | 956 | No | |
| U. of Massachusetts at Boston to Support Marine Systems Research | 479 | Initial Information | Research |
| UMASS Integrative Science Building | 1,913 | No | |
| **Michigan Project** | | | |
| Lapeer Regional Medical Center CT Simulator | 383 | No | |
| **Mississippi Projects** | | | |
| Jackson State University in Jackson, Mississippi, for Bioengineering Research Training | 1,913 | Initial Information | Construction |
| U. of Mississippi Medical Center in Jackson, Mississippi, to Fund Research in the Areas of Increasing Efficiency by Reducing the Amount of Contrast Media Needed for Certain Procedures | 573 | Initial Information | Research |
| **Missouri Project** | | | |
| Northwest Missouri State University in Maryville, Missouri, for the Nanoscience Education Project | 1,147 | Initial Information | Construction |
| **Nebraska Project** | | | |
| U. of Nebraska Medical Center in Omaha to Conduct Nanoscale Imaging of Proteins | 1,913 | Formal Application | Research |
| **Nevada Projects** | | | |
| Nevada Cancer Institute in Las Vegas to Support Research of Cellular Antigens and Nuclei Acids | 479 | Formal Application | Research |
| St. Rose Dominican Hospitals Sienna Trauma Center | 479 | Initial Information | Construction |
| U. of Nevada, Las Vegas, Nevada Water in the 21st Century Multi-Disciplinary Research Project | 956 | No | |
| **New Jersey Projects** | | | |
| Advanced Laboratory Technology initiative | 479 | Initial Information | Construction |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| Nutley Energy Efficient Elementary Schools | 479 | No | |
| Seton Hall University Science and Technology Center | 956 | Initial Information | Construction |
| St. Clare's Hospital | 479 | Initial Information | Construction |
| **New Mexico Projects** | | | |
| New Mexico Center for Isotopes in Medicine | 717 | Formal Application | Research |
| New Mexico Tech University in Socorro, New Mexico, for Applied Energy Science Design | 1,435 | No | |
| Sandia Institute for Advanced Computing Algorithms, New Mexico, for High Performance Computing and Advanced Algorithm Development | 7,114 | Funds Provided | Research |
| U. of New Mexico in Albuquerque, New Mexico, for the MIND Institute Ongoing Research into Brain Related Research Including Supporting Research of Military Personnel Suffering from Post Traumatic Stress Disorder, Depression and Traumatic Brain Injuries | 11,478 | Formal Application | Construction/ Research |
| WIPP in Carlsbad, New Mexico, to Support Neutrino Research | 1,435 | Funds Provided | Research |
| **New York Projects** | | | |
| Bronx Community College Sustainable Energy Center | 287 | Initial Information | Construction |
| Energy efficiency through the NY Industrial Retention Network | 479 | Formal Application | Research |
| Environmental System Center at Syracuse University | 717 | No | |
| Fordham University Regional Science Center | 670 | No | |
| Hofstra University Center for Condensed Matter Research | 525 | Initial Information | Research |
| Nanosystems Initiative at the University of Rochester | 956 | No | |
| New School University Green Building | 1,913 | Initial Information | Construction |
| Rockland Community College Science Laboratory | 479 | No | |
| South County Nature Preserve, Irvington, NY | 239 | Initial Information | Construction |
| Urban Research Center and Greenhouse, Brooklyn | 479 | Initial Information | Construction |
| **North Carolina Projects** | | | |
| Bennett College Science and Technology facility | 956 | No | |
| Green Energy Xchange | 803 | No | |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| Levine Children's Hospital CT Scanner | 956 | Initial Information | Construction |
| U. of NC Collaborative Initiative in Biomedical Imaging | 956 | No | |
| Wake Forest University Research on Alternatives to Transplantation | 956 | No | |
| **North Dakota Project** | | | |
| U. of ND in Grand Forks to Support Antibodies Research | 2,391 | No | |
| **Ohio Projects** | | | |
| Bulk Production of Metallic Glass | 479 | Initial Information | Research |
| Columbus Children's Hospital Imaging Equipment | 956 | No | |
| Decision Support Tools for Complex Analysis | 1,913 | Initial Information | Research |
| Geothermal Demonstration Project | 479 | No | |
| Good Samaritan Hospital Specialty Cancer Center | 383 | Initial Information | Construction |
| Xavier University Science Equipment | 479 | Initial Information | Construction |
| **Oklahoma Project** | | | |
| U. of Oklahoma in Norman, Oklahoma, for the Large Scale Application of Single-Walled Carbon Nanotubes | 956 | Formal Application | Research |
| **Pennsylvania Projects** | | | |
| Advanced Cellular and Biomolecular Imaging | 479 | Formal Application | Construction/ Research |
| Albright College Science Facilities | 334 | No | |
| Cheyney University STEM education infrastructure | 1,195 | Initial Information | Construction |
| Lightweight Power Supply Development | 479 | No | |
| Mathematics, Science and Technology Research and Training Lab project | 2,391 | Initial Information | Construction |
| St. Joseph's University Science Center Equipment | 765 | Initial Information | Construction |
| **South Carolina Project** | | | |
| South Carolina Lambda Rail Computer Network Portal | 1,147 | Initial Information | Construction |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| **South Dakota Project** | | | |
| South Dakota Catalyst Group for Alternative Energy to Support Research that will Synthesize, Characterize and Scale Up Production of Catalysts Important for Energy Alternatives to Fossil Fuels | 1,052 | Initial Information | Research |
| **Tennessee Project** | | | |
| Purdue Calumet Inland Water Institute (*IN in Conference Report*) | 479 | Formal Application | Research |
| **Texas Projects** | | | |
| Alliance for NanoHealth | 717 | Initial Information | Research |
| Cardiac Catheterization Research and Equipment | 717 | No | |
| Children's Oncology Group Childhood Cancer Research | 191 | No | |
| Lake Granbury and Lake Whitney Assessment | 479 | Initial Information | Research |
| Memorial Hermann Baptist Hospital Orange--1.5T MRI | 573 | Initial Information | Construction |
| Texas Center for Advanced Science Computing and Modeling | 717 | Formal Application | Research |
| **Utah Projects** | | | |
| Imaging and Oncology Equipment at UVSC | 717 | Initial Information | Research |
| Logan Cancer Center Equipment and Technology | 956 | Initial Information | Construction |
| Westminster College Science Center | 383 | Initial Information | Construction |
| **Vermont Projects** | | | |
| U. of Vermont in Burlington to Conduct Research of MRI Science | 956 | Initial Information | Construction |
| U. of Vermont in Burlington to Support Research in Agricultural, Environmental, and Biological Sciences | 2,869 | Initial Information | Construction |
| **Virginia Project** | | | |
| Belmont Bay Science Center | 239 | Initial Information | Research |
| **Washington Projects** | | | |
| Inland Northwest Research Alliance (INRA) Water Research | 1,435 | Initial Information | Research |
| Proton Beam Therapy | 717 | Initial Information | Construction |

| Project Title | Funding ($000) | Paperwork Received | Construction and/or Research |
|---|---|---|---|
| **West Virginia Project** | | | |
| Neurosciences Institute in Morgantown, West Virginia, to Support Molecular Genetics Research | 1,913 | Initial Information | Construction |
| | 120,161 | | |

QUESTIONS FROM CONGRESSMAN HOBSON

CONGRESSIONAL DIRECTION

Mr. Hobson. Dr. Orbach, I know you understand the importance of having a five year budget plan for the major programs in the Department, and credible business plans for the DOE laboratories. Despite clear direction from Congress, the Department failed to submit a five-year budget plan this year, and the Secretary made clear last week that he has no intention of doing so at any time later this year.

You have always seemed to understand the value of such long-range planning, as demonstrated by your Twenty-Year Facilities Outlook for the Office of Science. Are you still doing a five-year budget plan internally, even if the Secretary will not let that plan be delivered to Congress?

Dr. Orbach. Yes. The Office of Science is putting together a five-year plan for internal planning purposes that we hope to finalize by the end of the summer.

Mr. Hobson. Could you tell us about any plans for major new construction projects or major new research initiatives that you expect to surface within the next five years?

Dr. Orbach. Some of the major new or enhanced construction projects or research initiatives being contemplated within the next five years include award of the Energy Frontier Research Centers, a second target station for the Spallation Neutron Source, continued upgrade of our computing facilities as we move to the petascale, and an upgrade to the neutrino source at Fermilab. The FY 2009 request is key to several projects and research areas where efforts are already underway or would be in FY 2009, including ITER, the National Synchrotron Light Source II, the Facility for Rare Isotope Beams, the Infrastructure Modernization Initiative, and the 12 GeV Upgrade for the Continuous Electron Beam Accelerator Facility.

CONGRESSIONAL DIRECTION

Mr. Hobson. Are you still requiring your ten Science labs to do business plans?

Dr. Orbach. We require annual updates to the business plans for our ten Office of Science laboratories.

Mr. Hobson. While I still believe those business plans are valuable tools, we were not that impressed with the quality of what the labs prepared. Why do these labs have such a difficult time developing a focused plan for their futures?

Dr. Orbach. The potential value of the laboratory business plans for describing the future of the laboratories is limited by the budgetary information available for the out-years at the time the plans are developed. When there are approved multi-year construction projects at a laboratory, we can provide a better focused plan for that part of the laboratory. We are in the third year of doing these business plans and the plans are evolving, and we are striving to improve the product with each passing year.

Mr. Hobson. In your opinion, have some of the DOE labs become TOO entrepreneurial, chasing after every new source of potential funding? I have in mind not so much the Science labs as the Nuclear Weapons labs, but I would appreciate your thoughts on the proper role of the DOE labs - is it to execute the missions of the DOE, or is it to stay in business for themselves?

Dr. Orbach. The DOE laboratories primary role continues to be supporting the missions of the Department. However, these laboratories have long been recognized as having capabilities that can appropriately be made available to help other Federal agencies meet their national mission needs. For example, the enabling legislation for the Department of Homeland Security (DHS) established a special relationship between our two agencies to ensure DHS access to the laboratories in order to help DHS carry out its critical national security missions. While the DOE laboratories must continue to effectively execute the missions of DOE, the Department should also oversee the process whereby the unique and specialized capabilities and facilities developed in support of DOE missions are made available to non-DOE sponsors.

QUESTIONS FROM CHAIRMAN VISCLOSKY

BALANCE BETWEEN RESEARCH AND FACILITIES

Chairman Visclosky. DOE estimates that the FY 2009 President's Request for the Office of Science will support about 23,700 graduate students and PhD researchers at universities, laboratories, and industry. This is an increase of over 2,643 over the FY 2008 Appropriations, which supports 21,057 scientific employment opportunities. The FY 2008 President's Request would have supported 25,418 scientific employment opportunities, 4,361 more than could be supported by the final constrained appropriation.

Why is the level of scientific employment for FY 2009 smaller than that proposed for FY 2008, even though the FY 2009 budget request is larger than the FY 2008 budget request?

Dr. Orbach. The primary reason for the difference between the overall employment estimate in the FY 2008 request and the FY 2009 request is that the Basic Energy Sciences program revised their methodology for estimating employment levels to make their estimates more consistent with the periodic employment surveys they perform. This new employment model reduced the overall Basic Energy Sciences employment estimates by about 14 percent, and since Basic Energy Sciences' scientific employment is about half the Office of Science total, this reduced the overall estimate significantly. Had the FY 2008 request employment estimate been calculated using this new model, overall estimated SC scientific employment in the FY 2008 request would have been about 23,500, and the FY 2009 request would reflect a small increase over the FY 2008 request level. Also, two user facilities are closed in FY 2009 that would have been open in FY 2008 at the request level: the B-Factory at the Stanford Linear Accelerator Center, which was scheduled to complete operations at the end of FY 2008 and the Intense Pulsed Neutron Source at Argonne National Laboratory, which was expected to remain open in FY 2008 and beyond. Under the FY 2008 appropriation, operations of the Intense Pulsed Neutron Source were terminated and closure of the B-Factory was accelerated by about 6 months. Both of these actions reduced the number of researchers supported in FY 2009.

Chairman Visclosky. What program shifts would be required to bring the '09 level up to that proposed for '08 without increasing overall Science funding?

Dr. Orbach. The methodology used by the Basic Energy Sciences program was updated for the FY 2009 budget submission, and the new model resulted in overall lower employment estimates. Had the scientific employment in the FY 2008 request been estimated using this model, the FY 2008 request would have been about 23,500, or slightly smaller than the FY 2009 request level.

Chairman Visclosky. For the record, could you provide the Committee with a breakdown of the Office of Science budget request for FY 2009 into the following categories:

I. Operation, maintenance, security, and upkeep of all existing Office of Science facilities, buildings, and other capital assets at the start of FY 2009. Costs for Operating time at user facilities should be broken out by site. This information should include the percentage utilization supported by the budget request and relation to FY 2007 and 2008 utilization.

II. Support of all Federal employees and related obligations at the proposed budget level within the Office, excluding obligations captured in category I, by office. This information should include an explanation of any changes to current year staffing levels.

III. Support of contractor employees at the proposed budget level at the national laboratories and at other DOE sites, excluding obligations captured in category I, by site. This information should include an explanation of any changes to current year staffing levels.

IV. Obligated funds for research grants which were awarded and scheduled to begin disbursement prior to the end of FY 2008, by amount and year of obligation (in the case of multi-year grants).

V. New funds for research grants which are expected to be awarded and or disbursed after the end of FY 2008.

VI. Obligated funds for construction or other activities not included in the previous categories which were scheduled to begin prior to the start of FY 2009.

VII. Funds for new construction or other activities not included in the previous categories and scheduled to begin in FY 2009 or later.

Dr. Orbach. The requested breakout of the Office of Science FY 2009 budget request to Congress is shown in a table I would like to insert for the record. The information follows:

**Office of Science**
**FY 2009 Budget Request to Congress**
(dollars in thousands)

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| **I. Operation, maintenance, security, and upkeep of all existing Office of Science facilities, buildings, and other capital assets**[1] | | | | |
| ***Facility Operations*** | | | | |
| **Argonne National Laboratory** | | | | |
| Advanced Photon Source (BES) | | | | |
| Funding | 105,000 | 105,000 | 116,514 | +11,514 |
| Hours of operation | 4,751 | 4,380 | 4,800 | +420 |
| Optimal hours of operation | 5,000 | 5,000 | 5,000 | —— |
| Percent of optimal operation | 95.0% | 87.6% | 96.0% | +8.4% |
| Advanced Photon Source Structural Biology Beamline (BER) | | | | |
| Funding | 4,200 | 4,450 | 3,960 | -490 |
| Argonne Leadership Computing Facility (ASCR) | | | | |
| Funding | 17,910 | 26,442 | 30,000 | +3,558 |
| Hours of operation | 3,000 | 7,008 | 7,008 | —— |
| Optimal hours of operation | 3,000 | 7,008 | 7,008 | —— |
| Percent of optimal operation | 100.0% | 100.0% | 100.0% | —— |

[1] Hours of operations, optimal operations, and percent of optimal operations are not shown for some facilities where this sort of reporting is not appropriate. This includes facilities such as the Nanoscale Science Research Centers in Basic Energy Sciences, where usage of the facility is not dependent upon a central accelerator or other such large equipment, as well as structural biology beamlines in Biological and Environmental Research where usage is dependent upon operations of the core facility, which is reported separately. Operations are not reported in FY 2009 for the Combustion Research Facility, the Free Air Carbon Dioxide Enrichment Facility because these facilities are no longer considered user facilities. Operations are not reported in FY 2009 for the B-Factory and the Intense Pulsed Neutron Source because operations of these two facilities ended in FY 2008.

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Argonne Tandem Linear Accelerator System (NP) | | | | |
| Funding | 17,314 | 17,664 | 20,210 | +2,546 |
| Hours of operation | 4,146 | 5,200 | 5,900 | +700 |
| Optimal hours of operation | 7,000 | 6,600 | 6,600 | —— |
| Percent of optimal operation | 59.2% | 78.8% | 89.4% | +10.6% |
| Center for Nanoscale Materials (BES) | | | | |
| Funding | 18,019 | 18,526 | 20,857 | +2,331 |
| Intense Pulsed Neutron Source (BES) | | | | |
| Funding | 15,500 | 8,000 | 4,000 | -4,000 |
| Hours of operation | 2,965 | 1,000 | —— | -1,000 |
| Optimal hours of operation | 3,600 | 3,600 | —— | -3,600 |
| Percent of optimal operation | 82.4% | 27.8% | —— | -27.8% |
| **Total, Argonne National Laboratory (facility operations funding)** | **177,943** | **180,082** | **195,541** | **+15,459** |
| **Brookhaven National Laboratory** | | | | |
| Center for Functional Nanomaterials (BES) | | | | |
| Funding | —— | 18,250 | 20,150 | +1,900 |
| National Synchrotron Light Source (BES) | | | | |
| Funding | 36,900 | 36,900 | 40,149 | +3,249 |
| Hours of operation | 5,971 | 4,900 | 5,200 | +300 |
| Optimal hours of operation | 5,400 | 5,400 | 5,400 | —— |
| Percent of optimal operation | 110.6% | 90.7% | 96.3% | +5.6% |
| National Spallation Neutron Source Structural Biology Beamline (BER) | | | | |
| Funding | 3,200 | 2,800 | 3,200 | +400 |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Relativistic Heavy Ion Collider (NP) | | | | |
| Funding | 145,790 | 145,572 | 160,985 | +15,413 |
| Hours of operation | 2,006 | 2,230 | 3,100 | +870 |
| Optimal hours of operation | 4,500 | 4,100 | 4,100 | —— |
| Percent of optimal operation | 44.6% | 54.4% | 75.6% | +21.2% |
| **Total, Brookhaven National Laboratory (facility operations funding)** | **185,890** | **203,522** | **224,484** | **+20,962** |
| **Fermi National Accelerator Laboratory** | | | | |
| Tevatron (HEP) | | | | |
| Funding | 269,948 | 244,090 | 278,024 | +33,934 |
| Hours of operation | 4,620 | 5,040 | 5,040 | —— |
| Optimal hours of operation | 4,560 | 5,400 | 5,400 | —— |
| Percent of optimal operation | 101.3% | 93.3% | 93.3% | —— |
| **Lawrence Berkeley National Laboratory** | | | | |
| Advanced Light Source (BES) | | | | |
| Funding | 48,797 | 47,367 | 51,049 | +3,682 |
| Hours of operation | 3,916 | 5,000 | 5,400 | +400 |
| Optimal hours of operation | 4,200 | 5,600 | 5,600 | —— |
| Percent of optimal operation | 93.2% | 89.3% | 96.4% | +7.1% |
| Advanced Light Source Structural Biology Beamline (BER) | | | | |
| Funding | 1,900 | 1,900 | 1,900 | —— |
| National Energy Research Scientific Computing Center (ASCR) | | | | |
| Funding | 37,554 | 54,200 | 54,790 | +590 |
| Hours of operation | 8,585 | 8,585 | 8,585 | —— |
| Optimal hours of operation | 8,760 | 8,760 | 8,760 | —— |
| Percent of optimal operation | 98.0% | 98.0% | 98.0% | —— |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| The Molecular Foundry (BES) | | | | |
| Funding | 19,056 | 18,250 | 20,150 | +1,900 |
| **Total, Lawrence Berkeley National Laboratory (facility operations funding)** | **107,307** | **121,717** | **127,889** | **+6,172** |
| **Oak Ridge National Laboratory** | | | | |
| Center for Nanophase Materials Sciences (BES) | | | | |
| Funding | 18,115 | 18,000 | 19,975 | +1,975 |
| High Flux Isotope Reactor (BES) | | | | |
| Funding | 55,705 | 54,511 | 58,780 | +4,269 |
| Hours of operation | 1,178 | 3,100 | 3,900 | +800 |
| Optimal hours of operation | 1,200 | 4,500 | 4,500 | —— |
| Percent of optimal operation | 98.2% | 68.9% | 86.7% | +17.8% |
| High Flux Isotope Reactor Structural Biology Beamline (BER) | | | | |
| Funding | 1,100 | 1,100 | 1,100 | —— |
| Holifield Radioactive Ion Beam Facility (NP) | | | | |
| Funding | 17,829 | 18,255 | 20,161 | +1,906 |
| Hours of operation | 4,986 | 3,800 | 4,800 | +1,000 |
| Optimal hours of operation | 5,775 | 6,100 | 6,100 | —— |
| Percent of optimal operation | 86.3% | 62.3% | 78.7% | +16.4% |
| Oak Ridge Leadership Computing Facility (ASCR) | | | | |
| Funding | 77,000 | 83,716 | 85,000 | +1,284 |
| Hours of operation | 7,008 | 7,008 | 7,008 | —— |
| Optimal hours of operation | 7,008 | 7,008 | 7,008 | —— |
| Percent of optimal operation | 100.0% | 100.0% | 100.0% | —— |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Spallation Neutron Source (BES) | | | | |
| Funding | 165,500 | 164,640 | 177,640 | +13,000 |
| Hours of operation | 540 | 2,700 | 4,000 | +1,300 |
| Optimal hours of operation | 670 | 2,700 | 4,500 | +1,800 |
| Percent of optimal operation | 80.6% | 100.0% | 88.9% | -11.1% |
| **Total, Oak Ridge National Laboratory (facility operations funding)** | **335,249** | **340,222** | **362,656** | **+22,434** |
| **Pacific Northwest National Laboratory** | | | | |
| Environmental Molecular Sciences Laboratory (BER) | | | | |
| Funding | 41,360 | 42,568 | 48,448 | +5,880 |
| Hours of operation | 4,365 | 4,365 | 4,365 | —— |
| Optimal hours of operation | 4,365 | 4,365 | 4,365 | —— |
| Percent of optimal operation | 100.0% | 100.0% | 100.0% | —— |
| **Princeton Plasma Physics Laboratory** | | | | |
| National Spherical Torus Experiment (FES) | | | | |
| Funding | 33,525 | 38,830 | 35,437 | -3,393 |
| Hours of operation | 508 | 720 | 440 | -280 |
| Optimal hours of operation | 1,000 | 1,000 | 1,000 | —— |
| Percent of optimal operation | 50.8% | 72.0% | 44.0% | -28.0% |
| **Stanford Linear Accelerator Center** | | | | |
| B-Factory (HEP) | | | | |
| Funding | 101,708 | 63,869 | —— | -63,869 |
| Hours of operation | 4,200 | 1,300 | —— | -1,300 |
| Optimal hours of operation | 5,200 | 5,850 | —— | -5,850 |
| Percent of optimal operation | 80.8% | 22.2% | —— | -22.2% |
| SLAC Linac operations (BES) | | | | |
| Funding | 37,550 | 61,500 | 96,700 | +35,200 |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Stanford Synchrotron Radiation Lab (BES) | | | | |
| Funding | 30,725 | 30,825 | 33,028 | +2,203 |
| Hours of operation | 5,424 | 4,500 | 5,000 | +500 |
| Optimal hours of operation | 5,400 | 5,400 | 5,400 | —— |
| Percent of optimal operation | 100.4% | 83.3% | 92.6% | +9.3% |
| Stanford Synchrotron Radiation Lab Structural Biology Beamline (BER) | | | | |
| Funding | 4,350 | 4,450 | 3,786 | -664 |
| **Total, Stanford Linear Accelerator Center (facility operations funding)** | **174,333** | **160,644** | **133,514** | **-27,130** |
| **Thomas Jefferson National Accelerator Facility** | | | | |
| Continuous Electron Beam Accelerator Facility (NP) | | | | |
| Funding | 82,920 | 80,955 | 88,509 | +7,554 |
| Hours of operation | 5,719 | 3,500 | 4,400 | +900 |
| Optimal hours of operation | 5,400 | 5,600 | 5,980 | +380 |
| Percent of optimal operation | 105.9% | 62.5% | 73.6% | +11.1% |
| **Los Alamos National Laboratory** | | | | |
| Los Alamos Neutron Scattering Center (BES) | | | | |
| Funding | 10,500 | 10,500 | 11,155 | +655 |
| Hours of operation | 2,806 | 3,000 | 3,500 | +500 |
| Optimal hours of operation | 3,600 | 3,600 | 3,600 | —— |
| Percent of optimal operation | 77.9% | 83.3% | 97.2% | +13.9% |
| Los Alamos Neutron Scattering Center Structural Biology Beamline (BER) | | | | |
| Funding | 1,000 | 1,000 | 1,000 | —— |
| **Total, Los Alamos National Laboratory (facility operations funding)** | **11,500** | **11,500** | **12,155** | **+655** |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| **Sandia National Laboratories** | | | | |
| Center for Integrated Nanotechnologies [in partnership with Los Alamos] (BES) | | | | |
| Funding | 17,864 | 18,100 | 20,100 | +2,000 |
| Combustion Research Facility (BES) | | | | |
| Funding | 7,648 | 7,000 | —— | -7,000 |
| **Total, Los Alamos National Laboratory (facility operations funding)** | **25,512** | **25,100** | **20,100** | **-5,000** |
| **Facilities not located at National Laboratories** | | | | |
| Alcator C-Mod, MIT (FES) | | | | |
| Funding | 22,260 | 25,110 | 23,207 | -1,903 |
| Hours of operation | 480 | 480 | 416 | -64 |
| Optimal hours of operation | 800 | 800 | 800 | —— |
| Percent of optimal operation | 60.0% | 60.0% | 52.0% | -8.0% |
| Atmospheric Radiation Measurement (BER) | | | | |
| Funding | 34,783 | 35,251 | 37,853 | +2,602 |
| Hours of operation | 7,884 | 7,884 | 7,884 | —— |
| Optimal hours of operation | 7,884 | 7,884 | 7,884 | —— |
| Percent of optimal operation | 100.0% | 100.0% | 100.0% | —— |
| Bates Linear Accelerator Center, MIT (NP) | | | | |
| Funding | 2,000 | 2,000 | —— | -2,000 |
| DIII-D, General Atomics (FES) | | | | |
| Funding | 56,669 | 61,660 | 58,060 | -3,600 |
| Hours of operation | 512 | 720 | 400 | -320 |
| Optimal hours of operation | 1,000 | 1,000 | 1,000 | —— |
| Percent of optimal operation | 51.2% | 72.0% | 40.0% | -32.0% |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Free Air Carbon Dioxide Enrichment Facility (BER) | | | | |
| Funding | 4,977 | — | — | — |
| Hours of operation | 3,776 | — | — | — |
| Optimal hours of operation | 3,865 | — | — | — |
| Percent of optimal operation | 97.7% | — | — | — |
| Production Genomics Facility (BER) | | | | |
| Funding | 53,397 | 60,000 | 55,000 | -5,000 |
| Hours of operation | 8,400 | 8,400 | 8,400 | — |
| Optimal hours of operation | 8,400 | 8,400 | 8,400 | — |
| Percent of optimal operation | 100.0% | 100.0% | 100.0% | — |
| **Total, Facilities not located at National Laboratories (facility operations funding)** | **174,086** | **184,021** | **174,120** | **-9,901** |
| ***Total, Facility Operations Funding*** | ***1,619,573*** | ***1,633,251*** | ***1,700,877*** | ***+67,626*** |
| ***Other maintenance, security, and upkeep of existing Office of Science facilities, buildings, and other capital assets*** | ***83,172*** | ***85,628*** | ***101,911*** | ***+16,283*** |
| **Total, Operation, maintenance, security, and upkeep of facilities, buildings, and other capital assets** | **1,702,745** | **1,718,879** | **1,802,788** | **+83,909** |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| **II. Support of all Federal employees and related funding, excluding funding captured in category I** | | | | |
| Field Offices | | | | |
| Chicago | 28,187 | 26,060 | 31,363 | +5,303 |
| Oak Ridge | 43,584 | 43,450 | 45,341 | +1,891 |
| Ames | 519 | 555 | 576 | +21 |
| Argonne | 3,689 | 4,125 | 4,289 | +164 |
| Berkeley | 4,194 | 4,394 | 4,680 | +286 |
| Brookhaven | 3,747 | 4,234 | 4,529 | +295 |
| Fermi | 2,262 | 2,496 | 2,570 | +74 |
| New Brunswick | —— | 6,644 | 6,782 | +138 |
| Pacific Northwest | 4,836 | 5,053 | 5,618 | +565 |
| Princeton | 1,653 | 1,759 | 1,813 | +54 |
| Stanford | 2,123 | 2,551 | 2,625 | +74 |
| Thomas Jefferson | 1,550 | 1,872 | 1,965 | +93 |
| Total, Field Offices | 96,344 | 103,193 | 112,151 | +8,958 |
| Headquarters | 61,525 | 65,902 | 82,846 | +16,944 |
| Office of Scientific and Technical Information | 8,600 | 8,684 | 8,916 | +232 |
| **Total, Federal employees and related funding** | **166,469** | **177,779** | **203,913** | **+26,134** |
| *(Full-time equivalent Federal employment[2])* | *(942)* | *(1,058)* | *(1,100)* | *(+42)* |

[2] The net increase of 42 FTEs over FY 2008 includes 14 additional Program Managers and associated support staff to ensure sufficient resources are available to manage and support a significantly increased SC research investment that is a major component of the American Competitiveness Initiative (ACI). These additional FY 2009 FTEs build upon a substantial planned increase of Program Manager and support staff new hires requested in FY 2008, and address staffing concerns identified by numerous Committee of Visitor reports. An additional 7 FTEs are needed in the areas of science education and workforce development, human resources, financial management, and administrative services areas to ensure sufficient infrastructure exists to support a significantly expanded SC Program Office workforce. At Chicago, an increase of 20 FTEs will ensure that acquisition, financial, and other necessary infrastructure is in place to support a significantly increased SC R&D investment received under the ACI over the next 5 years. A functional transfer from the Office of Nuclear Energy includes 2 FTEs who manage the Isotope Program at SC Headquarters and 6 FTEs who manage the High Flux Isotope Reactor at the Oak Ridge Office. Offsetting reductions include 7 FTEs at Oak Ridge.

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| **III. Support of contractor employees at the national laboratories and at other DOE sites, excluding funding captured in category I** | | | | |
| SC Laboratories | | | | |
| Ames Laboratory | 21,808 | 20,332 | 22,453 | +2,121 |
| Argonne National Laboratory | 105,128 | 92,383 | 95,675 | +3,292 |
| Brookhaven National Laboratory | 134,389 | 122,608 | 117,477 | -5,131 |
| Fermi National Accelerator Laboratory | 74,878 | 75,621 | 99,331 | +23,710 |
| Lawrence Berkeley National Laboratory | 261,415 | 259,596 | 261,964 | +2,368 |
| Oak Ridge National Laboratory | 210,988 | 163,240 | 373,270 | +210,030 |
| Pacific Northwest National Laboratory | 75,112 | 70,444 | 68,215 | -2,229 |
| Princeton Plasma Physics Laboratory | 36,560 | 33,964 | 39,475 | +5,511 |
| Stanford Linear Accelerator Center | 70,024 | 63,844 | 137,219 | +73,375 |
| Thomas Jefferson National Accelerator Facility | 2,817 | 1,948 | 3,559 | +1,611 |
| Total, SC Laboratories | 993,119 | 903,980 | 1,218,638 | +314,658 |
| | | | | |
| Other National Laboratories | | | | |
| NNSA Laboratories | | | | |
| Lawrence Livermore National Laboratory | 52,584 | 46,600 | 50,020 | +3,420 |
| Los Alamos National Laboratory | 53,042 | 44,712 | 48,292 | +3,580 |
| Sandia National Laboratories | 21,520 | 25,015 | 34,592 | +9,577 |
| Total, NNSA Laboratories | 127,146 | 116,327 | 132,904 | +16,577 |
| Idaho National Laboratory | 4,182 | 4,357 | 3,598 | -759 |
| National Energy Technology Laboratory | 475 | 570 | 633 | +63 |
| National Renewable Energy Laboratory | 10,585 | 8,734 | 9,488 | +754 |

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| Savannah River National Laboratory | 1,291 | 720 | 1,097 | +377 |
| Total, Other National Laboratories | 143,679 | 130,708 | 147,720 | +17,012 |
| **Total, Contractor employees at the national laboratories and other DOE sites** | **1,136,798** | **1,034,688** | **1,366,358** | **+331,670** |
| *(Laboratory Scientific Employment[3])* | *(14,239)* | *(13,980)* | *(15,351)* | *(+1,371)* |
| **IV. Funding for research grants awarded and scheduled to begin disbursement prior to the end of FY 2008[4]** | **450,956** | **547,125** | **322,423** | **-224,702** |
| **V. Funds for research grants to be awarded and disbursed after the end of FY 2008[5]** | — | — | **277,746** | **+277,746** |
| **VI. Funds for construction or other activities not included in the previous categories which were scheduled to begin prior to the start of FY 2009** | | | | |
| Construction[6] | 166,188 | 162,378 | 241,046 | +78,668 |
| Other activities[7] | 213,457 | 332,293 | 391,250 | +58,957 |

[3] The FY 2009 increase in estimated laboratory employment results from the overall funding increases at DOE laboratories. Employment estimates also include employment resulting from funding reported under category I, facility operations.

[4] FY 2009 funding generally reflects second and third year funding of grants awarded in FY 2008 and FY 2007, respectively. FY 2008 funding includes funding for Congressionally-directed projects. Funding is generally obligated in the same year as appropriated. For instance, for a typical three-year grant awarded in FY 2007, FY 2007 appropriations would be obligated during FY 2007 to fund the first year of the grant, FY 2008 appropriations would be obligated during FY 2008 to fund the second year of the grant, and FY 2009 appropriations would be obligated during FY 2009 to fund the third year of the grant.

[5] Amounts include extension to existing grants beyond the initial award (which is typically for three years). Amounts also include a presumed university share of funding for the Energy Frontier Research Centers and other upcoming calls for proposals, but actual allocations among universities and others is dependent upon reviews of proposals received.

[6] Construction funding amounts include funding for the National Synchrotron Light Source II and 12 GeV Upgrade of the Continuous Electron Beam Accelerator Facility, where physical construction is planned to begin during FY 2009, but prior project funding was provided for project engineering and design.

[7] Other activities include funding for Small Business Innovation Research and Technology Transfer, Industry, Non-Profits, and other Federal Agencies. Other activities also include a presumed laboratory share of funding for upcoming calls for proposals, but actual allocations among laboratories and others are dependent upon reviews of proposals received.

| | FY 2007 Approp. | FY 2008 Approp. | FY 2009 Request | FY 2009 vs. FY 2008 |
|---|---|---|---|---|
| **Total, Funds for construction or other activities prior to FY 2009** | **379,645** | **494,671** | **632,296** | **+137,625** |
| **VII. Funds for new construction or other activities not included in the previous categories and scheduled to begin in FY 2009 or later** | | | | |
| Construction[8] | — | — | 24,435 | +24,435 |
| Other activities[9] | — | — | 92,010 | +92,010 |
| **Total, New construction or other activities** | — | — | **116,445** | **+116,445** |
| **Total, Office of Science** | **3,836,613** | **3,973,142** | **4,721,969** | **+748,827** |

[8] Construction funding reflects new construction starts within the Science Laboratories Infrastructure Program.

[9] Other activities reflects a presumed laboratory share of funding for upcoming calls for proposals for the Energy Frontier Research Centers and other new research associated with Basic Research Needs workshops, but actual allocations among laboratories and others are dependent upon reviews of proposals received

FY 2008 CARRY-OVER BALANCES

Chairman Visclosky. GAO provided the Committee with an assessment of FY 2008 carry-over balances which exceeded the standard DOE uncosted threshold. Several Office of Science programs appeared on this list. Please provide the Committee with a detailed justification for the large balances identified in the following programs for the record:

- **Materials Sciences and Engineering (KC0200000)**
  - Beginning FY08 Uncosted Balance: $244.7M
  - FY08 Appropriations: $954M
- **Medical Applications and Measurement Science (KP1400000)**
  - Beginning FY08 Uncosted Balance: $115.7M
  - FY08 Appropriations: $8.2M
- **Life Sciences CCL (KP1100000)**
  - Beginning FY08 Uncosted Balance: $80.0M
  - FY08 Appropriations: $294.7M
- **Advanced Scientific Computing Research (KJ000000)**
  - Beginning FY08 Uncosted Balance: $89.3M
  - FY08 Appropriations: $351.2M
- **Proton Accelerator-based Physics CCL (KA1100000)**
  - Beginning FY08 Uncosted Balance: $50.3M
  - FY08 Appropriations: $368.8M
- **Fusion Energy Sciences CCL (AT0000000)**
  - Beginning FY08 Uncosted Balance: $32.4M
  - FY08 Appropriations: $286.5M
- **Nuclear Physics CCL (KB0000000)**
  - Beginning FY08 Uncosted Balance: $35.8M
  - FY08 Appropriations: $415.2M
- **Chemical Sciences, Geosciences, and Energy Biosciences CCL (KC0300000)**
  - Beginning FY08 Uncosted Balance: $45.1M
  - FY08 Appropriations: $222.6M
- **Environmental Remediation CCL (KP1300000)**
  - Beginning FY08 Uncosted Balance: $39.5M
  - FY08 Appropriations: $93.8M
- **Climate Change Research CCL (KP1200000)**
  - Beginning FY08 Uncosted Balance: $33.1M
  - FY08 Appropriations: $136.9M

Dr. Orbach. The majority of the uncosted balances at the end of FY 2007 in Office of Science programs are the result of funding provided late in the fiscal year and a significant percentage of these funds have already been costed during the first four months of FY 2008. For the record, I would like to provide a more detailed explanation for each area identified by GAO. The information follows.

The uncosted balances for Materials Sciences and Engineering are related to outstanding subcontract and material commitments related to ongoing research activities at the SC Laboratories. The major drivers include activities at the Spallation Neutron Source, the High Flux Isotope Reactor, and the Center for Nanophase Materials Science at Oak Ridge National Laboratory and Linac operations at Stanford Linac Accelerator Center. Another significant portion of the uncosted balances was related to long-lead procurements funded by capital equipment, general plant projects, and accelerator improvements projects. The balances for these areas do not exceed the threshold for capital items.

For Medical Applications and Measurement Science, the uncosted balance is primarily grant funding associated with Congressionally directed projects from FY 2006 and earlier years. Of the $115.7 million balances identified, $114.2 million is associated with Congressionally directed projects, including $44.5 million associated with the Iowa Environmental and Education Project, which was placed on hold by the 2006 EWD appropriation and was rescinded by the 2008 Energy and Water Development appropriation. Through February 2008, an additional $20.6 million of the remaining balances have been costed.

The Life Sciences uncosted balance has two main drivers. Funding for the Bioenergy Research Centers ($30M) primarily at Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, and the University of Wisconsin was not awarded until late in FY 2007. In addition, advanced funding is required to support the Lawrence Berkeley National Laboratory's multi-year lease of the Production Genomics Facility ($18.1 million).

Approximately 77% of the uncosted balance for Advanced Scientific Computing Research has been costed in the first four months of FY 2008. Uncosted balances for the Leadership Computing Facility at Argonne National Laboratory was for commitments for lease payments, rentals for chillers, tape storage units and other site preparation activities. Uncosted balances at LBNL were committed to support lease payments for the NERSC upgrade, procurement of the NERSC Global File System, ESnet upgrades and infrastructure improvements. The uncosted at LLNL was for contractual commitments for milestone payments on the IBM Blue Gene contract. The ORNL uncosted is primarily due to contractual obligations for lease payments on the Leadership Computing Facility. In addition, funds are set aside for the ORNL-managed call for competitive university research grants to be awarded in FY 2008. Uncosted balances of $13 million remains to support the interagency agreement with the Defense Advanced Research Projects Agency (DARPA) for the Office of Science's contribution to the funding of an award to Cray, Inc. for the High Productivity Computing Systems Project (HPCS). Payments are to be made based on the achievement of milestones. However, DAPRA is in the process of re-negotiating the milestones with Cray.

For Proton Accelerator-based Physics Stat, $34.2 million or 70% of the identified $50M FY 2008 beginning uncosted balance for site facility management contractors has been costed through the first 4 months of FY 2008. The largest portion of the uncosted balance in this category was at Fermi National Accelerator Laboratory (Fermilab), which

accounted for $42 million of the $50 million. The Proton Accelerator-Based Physics subprogram at Fermilab, which includes the operation of the Tevatron accelerator complex for both collider and neutrino physics programs, including collider detectors and a neutrino experiment, which had an uncosted balance of $22.1M. A portion of the balance was to assure continuity of operations over the fiscal year boundary and the remaining was goods and services on order funding at the minimal acceptable level for the end of the fiscal year. The U.S. contributions to the Large Hadron Collider/Compact Muon Solenoid detector construction Software and Computing Program and maintenance and operations is managed by Fermilab. Of the uncosted amount of $15.5M for, 35 percent was committed via contracts to CERN, university partners and other vendors. Funds are committed and costed by these programs according to their approved international schedules.

The other activities funded by Fermilab are data-taking and analysis of experiments, accelerator improvements, experimental computing expansion and other detector support. The uncosted balances in these areas totaled $4.4M and will continue to be costed during FY 2008 for these activities.

For Fusion Energy Sciences,$21.4 million or 66% of the $32.5M FY 2008 beginning uncosted balance for site/facility management contractors has been costed through the first 4 months of FY 2008 . The balances are continuing to be costed during FY 2008 for the planned activities as described below.

The largest portion of the uncosted balance was at Oak Ridge National Laboratory (ORNL), which accounted for $15.3M of the $32.5M. The U.S. ITER R&D and Liaison activities at ORNL had an uncosted balance of $11.4M, which was the result of delays by the ITER Organization in making design decisions that were needed to proceed with certain U.S. R&D tasks. Much of the funding was sent to ORNL in July and September 2007. These funds will be fully costed by April. SciDAC funding, which accounted for $1.2M of the uncosted balance, was sent to ORNL in September 2007 after the selection process for new projects was completed. The other activities with uncosted balances totaling $2.8M include International Collaborations, research and development, data-taking and analysis of experiments.

The next largest portion was at Princeton Plasma Physics Laboratory (PPPL), which accounted for $13.3M of the $32.5M. PPPL's fixed institutional commitments account for approximately $8.3M for continuity of operations, land lease, and the graduate education program. PPPL had outstanding vendor commitments totaling approximately $0.9M, which were for goods and services on order as of September 30 but not delivered at the end of the fiscal year. Ongoing research, analysis and operations of the DIII-D, C-Mod, NSTX and NCSX experiments had uncosted balances totaling of $3.6M. SciDAC funding, which accounted for $0.6M of the uncosted balance, was sent to PPPL in September 2007 after the selection process for new projects was completed.

For Nuclear Physics, through the first 4 months of FY 2008, $9.6M or 27% of the $35.8M uncosted balance for Capital Equipment, General Plant Projects (GPP), and Accelerator Improvement Projects (AIP) has been costed through the first 4 months of

FY 2008. A number of Major Items of Equipment (MIE), GPP, and AIP projects in the Nuclear Physics program were delayed due to the FY 2007 Continuing Resolution. In addition, several ongoing projects experienced technical or vendor delays. These projects are all on track at this time and proceeding according to established plans: GRETINA MIE at LBNL, ($5.4M); STAR Time of Flight MIE at BNL - uncosted balance of $3.2M; PHENIX Silicon Vertex Tracker at BNL, ($0.9M); Heavy Ion Experiment MIE at the LHC, ($0.8M); GPP funding, for construction projects less than $5M, at BNL and TJNAF - uncosted balances of $6.5M and $2.1M, respectively; RHIC Stochastic Cooling AIP at BNL ($2.1M); Californium Source Upgrade (CARIBU) AIP at ANL ($2.0M); TJNAF Accelerator Operations equipment, needed for TJNAF experimental support and for operation and maintenance of the TJNAF facility ($3.0M).

The remaining uncosted balance of in $9.9M for Nuclear Physics is for a number of smaller projects at various laboratories and is well within the uncosted balance threshold for CE/GPP/AIP.

The Chemical Sciences, Geosciences, and Energy Biosciences uncosted balances were due to late award of funds due to the continuing resolution and commitments at BNL, LBNL, and PNNL for subcontracts for DNA sequencing and supplies. Capital Equipment balances support custom fabrication of research equipment and long-lead procurements. GPP balances will support completion of projects delayed by the CR at ORNL, ANL, and SLAC.

Environmental Remediation uncosted balances are necessary to support outstanding commitments, and to ensure continuity of research operations pending the outcome of ongoing merit reviews. Part of the balance is committed for a large lease payment stemming from the delayed procurement of the new supercomputer for the Environmental Molecular Sciences Facility at Pacific Northwest National Laboratory. Additionally, within the Environmental Remediation Sciences program there were approximately 75 active projects that, because of the continuing resolution, did not receive final allocations until late March. The uncosted balance for capital equipment resulted from the long lead times for the purchase of several items for the Environmental Molecular Sciences Laboratory (EMSL) facility at PNNL. The continuing resolution further contributed to the delays for equipment purchases. Uncosted balances for general plant projects resulted from long lead procurement times for office pod construction at the EMSL facility.

Climate Change Research uncosted balances support outstanding commitments, and ensure continuity of research operations pending the outcome of ongoing merit reviews. The balance includes $5.7M for grant awards made late in the fiscal year. Efforts are made to reduce this uncosted balance by processing awards as early as possible, however, the continuing resolution created funding uncertainty and delayed awards. Uncosted balances at laboratories include funding at ANL for operating the Atmospheric Radiation Measurement (ARM) sites, to support ARM activities at other DOE Laboratories and the continuation for outside contract commitments. Uncosted balances at ORNL and PNNL also support third party subcontract commitments.

FY 2008 OPERATING CHOICES AND INTENSE PULSED NEUTRON SOURCE

Chairman Visclosky. Dr. Orbach, budget constraints forced lower increases in spending than you had asked for last fiscal year. However, how these adjustments were applied was often determined by your office. A good example is the Intense Pulsed Neutron Source at Argonne National Laboratory.

According to the webpage of the IPNS, "In order to meet budget obligations, BES has ordered significant cutbacks in operations for all programs that they support. As a part of this cutback, BES has ordered a complete cessation of IPNS operations, effective immediately."

You had to make some hard choices last year, and we think that you generally did what you had to do. A little more insight into your decision would be helpful, however.

What was your rationale for eliminating this program altogether, while other programs within the same account were held constant or even increased?

Dr. Orbach. Intense Pulsed Neutron Source (IPNS) was a short-pulsed spallation neutron source that first operated all of its instruments in the user mode in 1981. The distinguished history of the IPNS includes its development of innovative instrumentation and source technology and its dedication to serving the users. However, the IPNS neutron power source became the weakest among the neutron scattering user facilities in the Nation. The Manual Lujan Jr. Neutron Scattering Center at LANSCE, the High Flux Isotope Reactor, and the Spallation Neutron Source are orders of magnitude more powerful than IPNS. Unfortunately, the low power of the IPNS prevented any of the instruments from being truly world-class. With the startup of the Spallation Neutron Source, the IPNS was planned for shutdown in FY 2009, and the constrained FY 2008 appropriations forced a premature and sudden termination of the facility in 2008.

FY 2008 OPERATING CHOICES AND INTENSE PULSED NEUTRON SOURCE

Chairman Visclosky. Dr. Orbach, the Committee would like to ask you in a bit more detail about choices that you made in prioritizing science programs in your FY 2008 operating plan.

In both the Basic Energy Sciences and Nuclear Physics programs, funding for proposals for use-inspired basic research, identified by a number of workshops held by the two programs as critical to broader DOE missions, was cut - what was the rationale for low priority given to these important research proposals in your FY 2008 operating plan?

Dr. Orbach. The modest increase in the FY 2008 appropriation over the FY 2007 appropriation for the Office of Science also represents a $500 million shortfall from the FY 2008 request. In addition, the FY 2007 appropriation was a $300 million shortfall from the FY 2007 Office of Science request. These successive major funding reductions required the Office of Science to make very difficult decisions to curtail or terminate some activities in most of its large programs. Some user facilities have been or will be closed permanently. Most large scientific user facilities have significantly decreased hours of operation and service to users. Construction projects and instrument fabrication projects have been delayed, resulting in cost and schedule growth. In addition, many promising new activities planned for FY 2008 had to be abandoned, including new initiatives in use-inspired basic research. Funding such new activities under constrained budgets, including inflationary pressures, would not have been possible without significant terminations and layoffs in productive core research programs.

The Basic Energy Sciences budget requests to Congress in FY 2007 and FY 2008 proposed significant increases for use-inspired fundamental research in areas selected to improve our Nation's energy security. About 1,500 scientists and representatives of DOE energy technology programs and energy industries participated in numerous topical workshops to help define the research agenda for these activities. The increases in the budget requests were part of a government-wide strategy to enhance U.S. world leadership in the physical sciences and maintain our Nation's competitive lead in technology.

Four major Basic Energy Sciences research initiatives in solar energy utilization, hydrogen research, advanced nuclear energy systems, and mid-scale instrumentation were announced and solicitations for research proposals were conducted in FY 2007. Over 700 research proposals were received. Because of the limited funding available in FY 2007, however, only 40 awards were made; most of the remaining proposals were held for funding consideration in FY 2008. Over 200 proposals would have been funded at the requested level, but all remaining proposals were declined at the appropriated level.

The Nuclear Physics budget requests to Congress in FY 2007 and FY 2008 proposed increases for nuclear physics research directed toward advanced reactor fuel cycles. A broad community of approximately 125 nuclear and computer scientists participated in a 2006 workshop to help define the research agenda for this topical area. Following this

workshop, a research initiative in advanced nuclear reactor fuel cycles was announced and a research proposal solicitation was conducted in FY 2007. Approximately 35 research proposals were received in response to the solicitation. Because of the limited funding available in FY 2007 for the overall Nuclear Physics program, no awards were made, and all proposals were held for funding consideration in FY 2008. Limited funding in FY 2008 led to most of the proposals being declined. About 10 percent of the proposals, identified as addressing the very highest priority arising from the workshop, are being reviewed, and will compete for funding with other highest priority Nuclear Physics activities.

The Energy Frontier Research Centers (EFRCs) proposed in the Office of Science FY 2009 budget request to Congress are based on the Basic Energy Sciences Advisory Committee (BESAC) grand challenges report, Directing Matter and Energy: Five Challenges for Science and the Imagination, the 2003 BESAC report, Basic Research Needs to Assure a Secure Energy Future, and the series of ten follow-on "Basic Research Needs" workshops over the next five years, which are available at: http://www.sc.doe.gov/bes/reports/list.html. Appropriations for the Basic Energy Sciences at the FY 2009 requested level of funding would put the Office of Science back on track to pursue the fundamental understanding necessary to help meet the global need for abundant, clean, and economical energy.

FY 2008 OPERATING CHOICES AND INTENSE PULSED NEUTRON SOURCE

Chairman Visclosky. A couple of years ago, the Relativistic Heavy Ion Collider program at Brookhaven ended up holding a big "bake sale" to get the funding it needed to operate the facility for the full twenty weeks they had planned - and they managed to rake in $13 million from private donors. In FY 2008, once again, RHIC's operating schedule has been cut from 30 weeks down to 13- are you counting on another bake sale to bail them out again this year? More seriously, what is your opinion regarding private philanthropic funding of basic science, and its implications for the future of basic science?

Dr. Orbach. Operations at both of the Nuclear Physics major facilities were significantly reduced in FY 2008, with RHIC operations reduced from the planned 30 to 19 weeks, and CEBAF from the planned 34 to 24 weeks. RHIC and CEBAF weeks of operations were reduced to avoid reductions-in-force as well as an impact to the 12 GeV CEBAF Upgrade project. The single donor private funding in FY 2006 had no long-term commitments.

I encourage the relationship of private philanthropic funding and publically funded research. Basic science is very relevant to the goals of philanthropic organizations which strive to improve the social and economic welfare of society. The history of science and philanthropy is perhaps clearest in the search for cures for diseases and cancers that engenders a common goal for public, philanthropic and the private sectors. But in many instances the philanthropists and the private sector lack expert knowledge or engineering skills, such that they either rely on or invest in publically funded complex instruments and unique facilities to further their own humanitarian or broader economic goals.

SCIENCE AND ENERGY STORAGE

Chairman Visclosky. Last month, this Committee held a hearing on Vehicle Technologies, and several experts from your national labs as well as the auto industry provided us with an update on this critical issue. A key theme we heard about from the panelists was importance of improving battery chemistry and technology, as well as the need to foster a domestic capacity for advanced battery manufacturing. Dr. Orbach, the Committee was pleased to see a significant increase in your request for electrical energy storage, as well as the department's presentation of an integrated R&D budget request for this area.

Could you tell us a bit more about the role of the Office of Science and basic research in addressing this need for improving electrical energy storage?

Dr. Orbach. A major technology gap in electrical energy storage technologies is the need to improve the energy and power densities at reasonable cost while improving lifetime over existing systems. Without effective electrical energy storage, renewable-yet intermittent-sources of energy such as wind and solar will not be able to significantly displace fossil, nuclear, and other conventional energy sources used for generating electricity for the power grid. Similarly, current battery technologies are limited, making plug-in hybrid or all-electric cars prohibitively costly and insufficient to meet consumer demands. Given its critical importance, electrical energy storage was the subject of a BES workshop held in April 2007. The workshop report noted that revolutionary breakthroughs in electrical energy storage have been singled out as perhaps the most crucial need for this nation's secure energy future. The report concluded that the breakthroughs required for tomorrow's energy storage needs will be realized with fundamental research to understand the underlying processes involved in electrical energy storage. For example, by mastering energy balance on the nanoscale through harvesting the large number of forces that are often operating simultaneously, such as electrostatic attraction and repulsion, chemical bonding, surface tension, and random forces from environmental fluctuations, a wide variety of structures can be assembled for 3-D architectures with multi-functionalities in energy storage unsurpassed by any given existing technologies. Other research areas include new capabilities to "observe" dynamic composition and structure; novel electrolytes with high conductivity over a broad temperature range and long-term stability; and theory, modeling, and simulation that integrate methods at different time and length scales. The knowledge gained will accelerate breakthrough advances in electrical energy storage devices for transportation use, and to take advantage of large but transient energy sources such as solar and wind.

Chairman Visclosky. Are there any other electrical energy storage concepts which the Office is working on that might be of interest for future vehicles?

Dr. Orbach. These include batteries, electrochemical capacitors, and other novel physical or chemical concepts with potential to deliver superior electrical energy storage capacities. Specifically, nanostructured electrodes with tailored architectures show great promise in significantly enhancing the energy storage capacity. For example,

fundamental studies of the electronic conductivity of lithium iron phosphate led to the discovery of doping-induced conductivity increases of eight orders of magnitude. This research discovery enabled the development of high power-density Li-ion batteries by A123 Systems to power electric vehicles such as the Chevy Volt and the Th!nk. In addition, current batteries operate with slightly less than one electron per redox center with typical electrode materials. New research on conversion reactions is looking at advanced materials to yield up to six electrons per redox center, allowing a large increase in battery power density. Furthermore, basic research in materials for capacitors is enabling the development of multi-functional nanoporous structures and facilitating the understanding of charge storage mechanisms at surfaces. Ultracapacitors complement battery power by allowing very rapid charge and discharge cycles and the high surface area of nanostructures yields high charge storage capacity. These different approaches offer exciting opportunities for the development of enhanced power storage and conversion devices.

Chairman Visclosky. How are you coordinating this research effort with the applied technology programs as well as with potential industrial partners to avoid duplication and ensure that promising basic science isn't just left on the shelf and actually put into practice?

Dr. Orbach. As part of the Department-wide research and development (R&D) integration effort, electrical energy storage has been selected as one of the six topical areas for enhanced R&D coordination. An R&D coordination plan for electrical energy storage has been jointly developed by the Office of Science, Office of Electricity Delivery and Energy Reliability, and Office of Energy Efficiency and Renewable Energy. The plan outlines the research areas for the coordinated R&D activities, with each office setting aside funding in the FY 2009 request for a formally coordinated program in electrical energy storage. Researchers supported by the Office of Science will follow the coordination plan will ensure that knowledge gained in the basic research program will be effectively communicated to applied technology programs for developing technology transfer to industry.

There have been many cases of knowledge transfer, using existing R&D integration mechanisms, with successful industrial impact. One example is the intermetallic alloy research, in which long-term basic research support at Oak Ridge National Laboratory has led to scientific breakthroughs in overcoming the brittle fracture of the alloys. This has enabled DOE technology programs to develop manufacturing processes to make intermetallic rolls for steel furnaces that out-perform traditional alloys, resulting in savings in the millions and the establishment of an active industry in the U.S. A second example concerns the battery research. A basic research project initiated by Office of Science at Massachusetts Institute of Technology more than a decade ago led to the discovery of a new nanostructured cathode material for battery applications. Based on the knowledge gained, a new battery technology was developed by A123Systems of Watertown, Massachusetts. The development was further aided by a DOE SBIR grant starting in 2002. Since then, A123Systems has been a forerunner in Li-ion battery technology with superior power, safety, and life over traditional rechargeable batteries.

These cases exemplify the success in translating basic research discovery to technology breakthroughs; they further validate the importance of long-term, broad-based fundamental research in developing competitive, domestic industry based on world-leading technologies. The proposed research program will follow these successful examples to address some of our most critical real-world energy challenges by tapping the imagination, creativity, and knowledge of the scientific community and by pushing the frontiers of science.

Chairman Visclosky. More generally, could you tell us about any other research that the Office of Science is engaged in that might benefit future vehicles?

Dr. Orbach. Other basic research areas supported by the Office of Science that may benefit future vehicles include: novel thermoelectric materials and conversion processes that turn waste heat into usable electricity; basic combustion science with emphasis on understanding and controlling the complex coupling of chemistry and turbulent flow for advanced vehicle concepts; and ultrahigh strength and light-weight materials to improve fuel efficiency in vehicle applications. In addition, Office of Science supports a broad-based basic hydrogen research program, which includes a component on new catalysts and membranes to improve efficiency and durability of fuel cells for hydrogen-power vehicles. Furthermore, Office of Science provides unique characterization tools via support of the scientific user facilities in synchrotron light sources, neutron sources, electron microscopy and microanalysis, as well as nanoscale synthesis and characterization capabilities. New in situ photon- and particle-based microscopic, spectroscopic, and scattering techniques with time resolution down to the femtosecond range and spatial resolution spanning the atomic and mesoscopic scales will provide key scientific insights to meet the challenge of developing future electrical energy storage systems. These measurements are critical to achieving the ability to design energy storage systems rationally, including materials and novel architectures that exhibit optimal performance. This information will help identify the underlying reasons behind failure modes and afford directions for mitigating them. In the area of fundamental combustion science, recent work using x-ray imaging to visualize soot formation in diesel engines at the Advanced Photon Source at Argonne complements the existing suite of optical diagnostics developed by the Combustion Research Facility at Sandia and provides an additional probe of the complex dynamics and chemistry of fuel injection in diesel engines.

Chairman Visclosky. Electrical energy storage is a technology that affects the viability and use of renewable energy, and alternative approaches to the power grid, and hybrid and electric vehicles. What are the prospects and potential future availability of the new capabilities included in research funded by the Office of Science?

Dr. Orbach. The basic research in electrical energy storage supported by Office of Science will address the current performance limitations of electrical energy storage devices. The research will focus on understanding charge transfer and ionic transport processes in complex storage devices to improve the energy and power densities, cycle lifetime, and safety. It is anticipated that advances gained in these areas will benefit the

transportation sector in developing low-cost, high-energy batteries or supercapacitors for plug-in hybrid or all-electrical vehicles. Improved energy storage will also significantly advance the commercial feasibility of renewable, intermittent power sources such as solar, wind, and wave energy. Improving the dispatchability of intermittent sources will facilitate load-leveling and peak-shaving for a more efficient and reliable electric grid system. Specifically, a fundamental understanding of charge transfer and transport processes in electrical energy storage systems will enable improvements in long cycle lifetimes and high energy-storage capacities. The interfaces of electrodes with electrolytes are astonishingly complex and dynamic. By characterizing the dynamic structures of interfaces, one may direct and control the paths of electrons and attendant trafficking of ions with exquisite fidelity. With this underpinning knowledge, wholly new concepts in materials design can be developed for producing materials that are capable of storing higher energy densities and have long cycle lifetimes. Furthermore, advances in fundamental theoretical methodologies and computer technologies provide an unparalleled opportunity for understanding the complexities of processes and materials needed to make the groundbreaking discoveries that will lead to the next generation of electrical energy storage for transportation and grid-scale storage applications.

Chairman Visclosky. Five years ago the hydrogen economy was viewed as a distant prospect due to the need for fundamental research breakthroughs.

What is the status of hydrogen technology R&D?

Dr. Orbach. There have been significant accomplishments in basic and applied hydrogen research in the past years, leading to major advances in hydrogen production, storage, and fuel cell technologies. Specifically, hydrogen production from natural gas has met its 2010 target of $3 per gallon of gasoline equivalent; hydrogen storage capacities have been increased by 50 percent; and fuel cells costs have been decreased by 60 percent. DOE and industry leaders have stated that fundamental science breakthroughs are needed in order to meet the longer-term (2015 and beyond) technological readiness requirements, and the research within the Basic Energy Sciences program initiated in FY 2005 to address these needs in continuing.

Chairman Visclosky. When should we expect a technically and economically viable hydrogen alternative for energy storage and transfer, including hydrogen powered vehicles?

Dr. Orbach. The DOE Hydrogen Posture Plan has identified target dates for key aspects of the hydrogen technologies to reach technological readiness, starting in 2015 and beyond. The progress in achieving these technical targets will depend on continued advances in basic and applied research. Specifically, results from long-term research in hydrogen production, storage, and utilization will allow continued improvement in performance and cost reductions after 2015, as ongoing scientific advances in areas like renewable hydrogen production reach technological readiness.

ADVANCED SCIENTIFIC COMPUTING AND RESEARCH - SCIDAC AND INCITE

Chairman Visclosky. Dr. Orbach, it seems to me that some of the expertise and capabilities that we have developed in our civilian national labs in supercomputing might be of significant interest not only to other scientists but also for commercial applications, like designing better engines. I believe your Scientific Discovery through Advanced Computation (SciDAC) and Innovative and Novel Computational Impact on Theory and Experiment (INCITE) programs are aimed at taking advantage of such opportunities.

Could you tell me more about these programs and what kinds of projects you're funding with it which have commercial applications?

Dr. Orbach. The Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program is an open, peer reviewed competition for the best science and engineering applications that can effectively utilize a large portion of the resource available. Since 2006 this has included industry, academia, and other agencies. We have received 17 proposals from industry-based researchers resulting in 11 awards to: The Boeing Company, Corning Incorporated (2), DreamWorks Animation, Fluent Inc., Gene Network Sciences, General Atomics (2), GM R&D Center, Pratt & Whitney, and Procter and Gamble. Fact sheets for each of these projects can be found on our website (www.sc.doe.gov/ascr/INCITE/index.html)

A small fraction of the leadership resources are held in reserve for the facility director and the Director of the Office of Science. These allocations have been used to assist potential INCITE users to test their code on the machine and to gain experience with the architecture. In 2007, General Motors R&D Center gained access to the Oak Ridge Leadership Computing Facility in this way and subsequently successfully competed for an INCITE award in 2008. The facility staff also assist INCITE awardees with optimizing their codes to get the most out of their allocation and we have received a great deal of praise for this assistance from INCITE awardees.

SciDAC results are published in the open literature, and the codes and tools are freely available through the open source process. This ensures that SciDAC outputs have a broad impact. Furthermore, in 2006, we established a SciDAC Outreach Center to provide assistance with complicated tools and codes and to help researchers meet the challenging demands of high-performance computing. This past year, the SciDAC Outreach Center partnered with the Council on Competitiveness to increase interaction with industrial computational scientists.

Chairman Visclosky. I was disappointed to see that with all the other increases you have requested, these programs were not also boosted - are there any barriers to expanding them?

Dr. Orbach. There are increases for these activities in the FY 2009 budget request. In the case of INCITE, the petaflop upgrade at Oak Ridge and the 500 teraflop upgrade at Argonne will result in at least 750,000,000 CPU hours to be available for INCITE in

2009. That is a factor of three more resources available than we have awarded in 2008. The SciDAC budget request is also increased by $1,818,000.

HIGH ENERGY PHYSICS AND FERMILAB

Chairman Visclosky. Dr. Orbach, I would like to ask you about High Energy Physics research, which addresses very basic questions about the nature of the universe - about its birth and the fundamental particles and forces that govern it. It is very basic science, at the very frontiers of knowledge and understanding.

The tagline used to describe the work of the Office of Science is that it pursues "science with a mission." How do questions about the origin of the universe fit into the mission needs of the Department?

Dr. Orbach. In the pursuit of fundamental research, high energy physics strengthens all of the sciences. The new knowledge gained, technology generated, and work force trained directly advances Office of Science and DOE missions, and in the long-term, this basic research provides the foundations not only for delivering on the DOE science and technology missions, but also for science research supported by other agencies, and benefits for society in general. Examples are numerous, of which I'll mention only a few: Without the accelerator technologies originally developed by high energy physics, DOE would not have been able to build the advanced light sources that are the core research tools for biology, chemistry, physics, and materials science today. One of the earliest synchrotron light sources in the world, the Stanford Synchrotron Radiation Lab, was developed in the 1970's as an add-on to a high-energy physics accelerator, and is still used today by scientists funded by BES, BER, and NIH. The 2-mile-long linac at the Stanford Linear Accelerator Center, which was used to discover quarks in the 1960's is being converted to the Linac Coherent Light Source within the BES program as the world's first x-ray free electron laser. Superconducting radiofrequency accelerator technology, first used in high-energy accelerators, has been applied to nuclear physics at Jefferson Lab, is the core technology underlying the Spallation Neutron Source, and will be utilized in next-generation light sources. The investment in developing industrial capacity to produce a new kind of superconducting wire cable, needed to build the Fermilab Tevatron Collider, had a spectacular and unexpected payoff when this capability was applied to meet the demands of the nascent commercial market for medical MRI devices. Lawrence Livermore National Laboratory has built and is currently testing a neutrino detector, originally developed by high energy physicists, as a demonstration of a new technology that may be a "game-changer" in nuclear nonproliferation. These examples demonstrate that HEP, while interesting its own right as a fundamental pursuit, has provided a long and continuing series of benefits for the broader mission of DOE and for the betterment of society.

Chairman Visclosky. Many of the impacts you've talked about seem to extend far beyond the interests of DOE missions - is DOE really the right home for support of high energy physics? It seems like that's much more in line with the mission goals of NSF to broadly advance science? Shouldn't it compete with other basic science priorities there rather than with the urgent, mission oriented programs at DOE?

Dr. Orbach. I believe that DOE is the proper organizational home for support of High Energy Physics. The DOE High Energy Physics program as the federal steward develops and operates complex, forefront user facilities and supports and nurtures the core capabilities, theories, experiments, and simulations at the extreme limits of science that have kept the U.S. at the forefront of intellectual leadership. This requires the long-term, sustained support of a mission-oriented organization. On one hand, HEP capabilities and developments benefit DOE missions, particularly in accelerator technologies, and have been used throughout the DOE laboratory complex. On the other hand, DOE has the engineering and project management capabilities which HEP utilizes in the development, construction, and operation of its large facilities and instrumentation. The Office of Science, in general, and High Energy Physics in particular, works with National Science Foundation and other agencies, as well with the international scientific community to coordinate and optimize the use of resources to deliver outstanding advancements in science as well as new technologies that benefit all of science and engineering. Given the success of these collaborations, we do not find it compelling, or cost effective, to consider reinventing elements of other agencies to replicate the engineering, facilities operations and project management capabilities of DOE.

Chairman Visclosky. In fact, as many recent reports have indicated, the U.S. has been losing its world leading position in high energy physics - do you believe that DOE has truly been an effective steward of this field?

Dr. Orbach. Yes, DOE has been an effective steward; we remain and will remain world leaders in high energy physics. The U.S. high energy physics program is more than just the "energy frontier" that is often discussed, and perhaps over-emphasized, in some scientific and popular reporting about the field. The high energy physics program is engaged in three scientific campaigns, each of which addresses foundational questions about how the universe works: at the energy frontier, in neutrino physics, and at the cosmic frontier. At the energy frontier we operate the Fermilab Tevatron, still the highest energy accelerator in the world. The Tevatron will be surpassed in total energy soon, by the Large Hadron Collider (or "LHC") in Europe, but that is why we are heavily involved in LHC so that our scientists will remain leaders at the energy frontier. In neutrino physics, recent discoveries have opened up possibilities that could transform our understanding of particle interactions and the nature of the early universe, so this is a particularly exciting time. We are the world leaders with operating experiments at Fermilab and in Minnesota, and we are developing several ideas for the future. At the cosmic frontier, we are also leaders in what is called "astro-particle" physics, because we have the world-leading experiments trying to detect the particles that make up the "dark matter" that keeps galaxies from spinning apart and to measure and understand the mysterious "dark energy" that accounts for three-quarters of the energy in the universe—but no one knows what it is. Also note that the energy frontier won't suddenly vanish in the U.S. and reappear in Europe. The Tevatron has several productive years remaining as the LHC turns on and the analysis ramp up; during that time the contest for some of the most interesting prizes in particle physics will be intense. As responsible stewards we are doing everything we can to ensure the Tevatron seizes the opportunity.

QUESTIONS FROM CONGRESSMAN HOBSON

HIGH ENERGY PHYSICS AND FERMILAB

Mr. Hobson. What is your current cost estimate for the International Linear Collider and what is the status of that project?

Dr. Orbach. The international Global Design Effort (GDE) released a Reference Design Report for the ILC in August of 2007. This report represents a baseline specification of the accelerator, detector, and sample sites. An ILC "value estimate" based on world-wide tenders, using the lowest reasonable price cost, for hardware and materials, was 6.62 Billion ILC Units (where 1 ILC Unit = $1 U.S. in 2007). Labor estimates were placed at 24 Million person hours or roughly 13,000 FTEs. The costing was done in this manner to allow different countries to obtain an estimate according to their specific costing methods. A recent translation, performed for a HEPAP budget exercise, of the ILC Units into a U.S. cost estimate for a seven year construction period, including equipment, labor, contingency, and escalation, under the artificial assumption that the U.S. would do the entire project alone and that it would be located in the U.S., puts the total cost at approximately $22 billion, although there is the expectation that further R&D would reduce this total somewhat. ILC is envisioned to be an international project and facility, and hence the U.S.'s share, should a decision be made to participate, would be some fraction of this cost that would depend upon whether the U.S. is the host or a partner. The GDE has now embarked on a Technical Design Phase due for completion in 2012 which will focus on risk and cost reduction and will have a cost estimate and project plan. The completion date for this phase is consistent with first physics from the Large Hadron Collider in Europe, which I believe is necessary before moving ahead with the ILC project.

Mr. Hobson. If the International Linear Collider is not ready for construction and remains off in the distant future, then what work should Fermilab being doing in the near term? We understand the desire of many to maintain the funding and workload at Fermi, not to mention maintaining the current workforce. But what mission justifies maintaining Fermilab at previous funding levels?

Dr. Orbach. Over the next couple of years, the Fermilab Tevatron Collider will still be an extremely productive facility at the energy frontier, and we expect to be in a race with the LHC for new discoveries. Fermilab has proposed a plan for developing a new high intensity proton accelerator that would make it a world leader in neutrino physics and other areas involving precision measurements. Understanding neutrinos is an integral part of the high energy physics mission, and we have asked the High Energy Physics Advisory Panel to assess this proposal as part of its charge to recommend a long-range plan that will keep the U.S. at the forefront of high energy physics in the next decade.

QUESTIONS FROM CHAIRMAN VISCLOSKY

HIGH ENERGY PHYSICS AND FERMILAB

Chairman Visclosky. The budget request for International Linear Collider (ILC) R&D is $35 million and the request for Superconducting Radiofrequency R&D, which is closely related, is $25 million.

What is the projected cost to build the ILC and what would be the U.S. share if our country were to host this next generation accelerator?

Dr. Orbach. I would like to point out that the Superconducting Radiofrequency (SRF) R&D program, while relevant to the ILC, is being supported for the development of U.S. capabilities and technology needed for a broad array of applications. For instance, SRF is a technology of choice for future free electron lasers and energy recovering linacs used to investigate the structure and behavior of materials and for proposed high intensity proton sources for the study of fundamental processes.

To answer your question directly, a recent translation of the internationally-based ILC value estimate, performed for a HEPAP budget exercise, into a U.S. cost estimate for a seven year construction period, including equipment, labor, contingency and escalation, under the artificial assumption that the U.S. would do the project alone and that it would be located in the U.S., puts the total cost at approximately $22 billion. A host country might be expected to provide approximately 50 percent of the funding and a partner country roughly 10 percent. Typically a partner would contribute in-kind with provision of components built domestically.

Chairman Visclosky. What level of increase would be required in the annual budget for high energy physics?

Dr. Orbach. As a partner, our level of participation in terms of dollars would be about twice our total investment in the Large Hadron Collider program. A project start around the middle of the next decade, and a HEP budget profile with yearly increases of approximately 6.5 percent (similar to the profile for the Office of Science envisioned in the American Competitiveness Initiative) would allow the U.S. program to both reap the scientific benefits of our investments at LHC and accommodate an ILC partnership. To host the ILC would require a significantly larger initiative.

Chairman Visclosky. Given these costs, is the ILC likely to become Super Conducting Super Collider 2- a large cost effort that cannot be sustained in the light of budget pressures across science R&D?

Dr. Orbach. There are many lessons associated with the termination of the Superconducting Super Collider (SSC) and we are working to understand the root causes of the cancelation and to avoid a repeat of history. The High Energy Physics program and the NSF Directorate for Social, Behavioral and Economic Sciences are jointly funding a

scholarly, independent, and peer reviewed analysis of the demise of the SSC. The study will focus on the managerial, cultural, and political aspects of the project and its findings will be published.

The Office of Science will participate in an ILC project in a manner consistent with the available resources and a vigorous domestic research program. The high energy physics community has been asked to formulate a strategic plan consistent with likely budget scenarios. The plan should be available in June of this year. We are also working to ensure the project is fully internationalized so that no one region would shoulder the cost of such a facility.

Chairman Visclosky. The UK has decided not to pursue the ILC. Is any other nation or the Europeans as a group prepared to shoulder the financing of the ILC?

Dr. Orbach. Because the science at the Terascale energy frontier remains compelling, worldwide interest remains in the next-generation facility, and both the European and Asian regions are participating in the Technical Design Phase. Recently Spain began supporting the Global Design Effort. The Europeans and Japanese have an active R&D program, particularly in superconducting RF technology that is the core of the ILC design, directed towards reducing the cost and technical risk of that technology. At this time no group or region has stepped forth as a primary financial partner in the ILC, as all regions are awaiting first physics from the LHC and completion of the Technical Design Phase.

Chairman Visclosky. Dr. Orbach, your budget request for Fermilab is an 18% increase over the fiscal year 2008 level, but only a 9% increase over fiscal year 2007.

What effect would it have on the work at Fermilab if we flat-lined its budget at the FY2008 level of $319 million?

Dr. Orbach. If the Fermilab budget was held at the FY 2008 level, the lab would only be able to run about 26 weeks in FY 2009, instead of the 42 weeks planned, and that would be the end of the Tevatron Collider running. This would be short sighted, and result in loss of the opportunity to reap the benefits of the investments of over a billion dollars over the years, in building the Main Injector and Antiproton Recycler, upgrading the CDF and D-Zero Detectors, and implementing electron cooling of the antiprotons. While these investments have built the first superconducting accelerator, discovered the bottom and top quarks, and made Fermilab the center of high energy physics for over 30 years, the Tevatron complex has now reached its highest performance and is positioned to achieve its planned goal of discovering the Higgs before the LHC program, and should be provided the resources to complete its program.

The funding level would also likely result in a salary freeze for the entire year and a reduction in force after the end of the collider run. However, even more serious is that no funds would be available to develop the capabilities for a future research program at Fermilab. If the overall funding for high energy physics is kept at the FY 2008 level, we

would have to seriously consider whether it makes sense to continue the NOvA project, as it will seriously lag behind its original schedule.

Chairman Visclosky. What if we provided the FY 2007 level of $344 million?

Dr. Orbach. We would try to run the Tevatron Collider to the extent possible and minimize the salary and staffing impacts. But we will have to balance that with the impacts on the NOvA project so that it does not fall too far behind.

FUSION ENERGY SCIENCES

Chairman Visclosky. Dr. Orbach, your request again includes funding for ITER - this year, $208 million for non R&D programs. If I remember correctly - Congress zeroed out non-R&D funding for ITER last year. At the very least, that should have sent the message that there are significant reservations about the value of the ITER project.

One of those concerns is the value of ITER for practical fusion energy. Some within the scientific community are commenting that while ITER may foster significant advances in the use of fusion within a tokamak, this approach is not likely to get us to cost-effective fusion energy that can be grid-competitive. At the root of this concern is that such a system would be taken off the grid too frequently in order to perform necessary maintenance, and that the amount of highly radioactive waste produced would pose significant disposal problems.

How would you respond to these claims? Is putting most of our fusion R&D eggs into the ITER basket the best way to get us closer to practical fusion energy?

Dr. Orbach. The purpose of ITER is to develop the scientific understanding of burning plasmas. Without a burning plasma, fusion is not an energy source. Therefore, ITER is on the critical path to the development of fusion as a practical energy source. It is not meant to be a prototype of a fusion power plant. The ITER design is based on our current understanding of how best to create, maintain, and control a burning fusion plasma with our existing materials and technology.

The tokamak concept is the most advanced magnetic confinement fusion configuration, and the only one that the world's fusion programs can currently conceive what is required to make fusion practical. While ITER is a tokamak, the understanding of burning plasmas that ITER leads to will be applicable to other magnetic fusion confinement configurations as well. ITER will provide a major advance in our knowledge base for fusion energy, and there are also other areas of research such as fusion engineering sciences and materials, that must be developed further to allow fusion to reach its fullest potential as an attractive and environmentally acceptable energy source. Just as with the ITER burning plasma program, fusion engineering sciences and materials activities are generally independent of the magnetic confinement configuration that would be used for practical fusion energy.

Inertial confinement fusion is an alternative approach to magnetic confinement fusion. The National Nuclear Security Administration's National Ignition Facility (NIF), which is being built at a cost of about $3.5 billion, is designed to achieve ignition and burn to support the needs of the stockpile stewardship program. NIF will also provide information on the basic scientific feasibility of inertial fusion energy.

In conclusion, we have a basic strategy to pursue the science of burning plasmas, address other key fusion science and technology issues that need to be resolved for fusion to move forward, and maintain a reasonable portfolio of other confinement concepts that reduce the risk in making fusion a potential energy source for the future.

Chairman Visclosky. What other options are out there?

Dr. Orbach. The U.S. has always tried to maintain a broad portfolio of potential configurations to harness and study fusion plasmas. Having such a portfolio helps us to not only accomplish our main objectives of developing the knowledge base for a new energy source and stewarding the field of plasma science and high energy density physics, but it also is a way to minimize risk in trying to develop the best fusion confinement configuration for practical fusion energy. Besides the tokamak concept, there are a number of other magnetic fusion configurations, such as stellarators and spherical tori, being studied world-wide as potential concepts for future energy systems. In addition, for inertial fusion energy, there are several possible drivers such as heavy ion beams or lasers that are being studied. However, none of these concepts is as far along as the tokamak. While some may exhibit conceptual advantages over a tokamak, it is much too early to tell, despite what the advocates of those concepts claim.

Chairman Visclosky. If the United States does not make any financial or technical contribution to the ITER project during FY2008, what will be the practical effect of that decision?

Dr. Orbach. Since the ITER Project remains the highest priority within the Office of Science, and since there was no language in the FY 2008 appropriation that indicated Congress' intent to terminate the ITER Project, FY 2008 contributions to the ITER project are continuing in the areas of U.S. personnel support at the ITER site and of hardware design, but at reduced levels within the total appropriation for ITER. Design activities for the U.S. in-kind hardware were significantly reduced, or in some cases, stopped completely. Less than one third of the planned design activities can be accomplished with the reduced funding. Because the U.S. has the lead in some of these activities, this will prolong design completion for the ITER Project as a whole. Specific impacts cannot be determined until the ITER Integrated Project Schedule has been developed from the bottom-up, which is well underway for presentation to the ITER Council in June 2008. A large effect of the decision to not fund contributions to ITER in FY 2008 is that U.S. input into critical design decisions could be muted at a critical point in the development of the ITER project. The U.S. interests in determining hardware choices to lead to successful outcomes in ITER, and on strong management to control costs and schedule, are potentially compromised. In addition the U.S. cannot pay any of its 2008 cash commitment to the ITER Organization. If the FY 2009 appropriation is similar to the FY 2008 appropriation, the U.S. may be regarded as being in permanent default by its international partners.

QUESTIONS FROM CONGRESSMAN HOBSON

FUSION ENERGY SCIENCE

Mr. Hobson. Can you explain why the Administration has not deemed ITER of sufficient importance to submit a supplemental funding request for FY2008? If the White House apparently does not consider this project all that important, why should Congress?

Dr. Orbach. ITER is an Administration priority, and is the highest priority activity within the DOE Office of Science. The U.S. remains committed to be part of the construction project and looks forward to accessing the scientific information obtained through the operation of ITER. The Administration looks forward to discussions with Congress that lead to a fully-funded ITER, now and in the future. The Department recognizes the funding shortfall for ITER and is working to address it through other means.

Mr. Hobson. How are currency fluctuations, such as the fall of the dollar vs. the euro, handled in determining what constitutes a 9.1% contribution to ITER?

Dr. Orbach. During the construction phase, ITER Members' contributions are credited against allocated commitments of hardware, personnel, and cash. ITER members receive credit for their contributions in ITER Units of Account, a unit of value that is immune to escalation and currency fluctuations. The amount of credit in ITER Units of Account does not increase, but the U.S. cost for the credit increases. Currency fluctuations impact the U.S. cost of doing business with the ITER Organization because cash payments to the ITER Organization are made in Euros.

QUESTIONS FROM CHAIRMAN VISCLOSKY

FUSION ENERGY SCIENCE

Chairman Visclosky. All three domestic plasma physics user facilities are proposed for budget cuts and significant decreases in operating time. Is this consistent with the new science results being produced by these U.S. facilities, and why should the U.S. program be marginalized by the decision to invest in international cooperation (i.e., ITER)?

Dr. Orbach. The three facilities are producing important results that are contributing to the resolution of ITER physics design issues, and preparing for its scientific exploitation, as well as expanding the knowledge base of fusion science. The achievement of burning plasmas is the next critical step in demonstrating the technical feasibility of fusion as an energy source, but no U.S. magnetic confinement fusion facility can or ever will be able to sustain a burning plasma. Without international collaboration on ITER, U.S. researchers will be marginalize as other industrialized nations investigate the physics of burning plasmas. With limited resources, the Fusion Energy Sciences program made difficult choices in order to keep a reasonable balance among all of its program elements including meeting our commitments to the ITER project. Given the value of the expected science that will be achieved in ITER, we believe our investment in ITER will pay big dividends for the U.S. program and is worth the cost.

Chairman Visclosky. With the exception of international work relevant to ITER, virtually all other science relevant to fusion and plasmas are being cut by 2-3%.

What is the long-term affect of the large funding commitment to ITER on support for U.S. plasma physics groups and facilities including the continuing need for some of them?

Dr. Orbach. ITER provides a central focus to the U.S. program in developing the knowledge base for scientific feasibility of fusion as an energy source. We hope to keep the research activities in the fusion energy sciences program at a constant level of effort during ITER construction. This does not mean that every activity will be kept constant. We expect that research efforts will grow and diminish, consistent with their importance to the science program and their accomplishment of goals. The noted 2 to 3 percent decrease in other science relevant to fusion and plasmas is a bit of a misunderstanding. The total investment in these areas is essentially constant. Small decreases were applied to the existing program to start investments in exciting future opportunities, including a Fusion Simulation Project, and mission and scoping studies for a future domestic initiative, and to expand certain existing elements of the FES program because of their immense scientific promise, such as the Joint Program in High Energy Density Laboratory Plasmas.

Chairman Visclosky. Are all the partners meeting their financial commitments?

Dr. Orbach. All ITER parties except the U.S. have paid their 2008 cash commitments, in full.

QUESTIONS FROM CONGRESSMAN HOBSON

FUSION ENERGY SCIENCE

Mr. Hobson. The NNSA apparently sees no role for the fusion work being done by the Naval Research Laboratory, as there is no funding in the FY 2009 request for the NRL. Do you agree with that assessment by NNSA?

Dr. Orbach. Energy development is not the mission of NNSA. From the perspective of the Fusion Energy Sciences (FES) program within the Office of Science, the current High Average Power Lasers program being pursued by NRL is not in sync with the program plan of our high energy density physics (HEDP) program. Inertial fusion energy sciences, which is part of our HEDP program within FES is being addressed as an area of research in high energy density laboratory plasmas focused on exploring various physics pathways to ignite and burn the target to produce fusion gain

QUESTIONS FROM CHAIRMAN VISCLOSKY

FUSION ENERGY SCIENCE

Chairman Visclosky. Last fall, you discussed with Committee staff a plan to determine whether there is a sufficient scientific user community to justify moving certain facilities from the NNSA to the Office of Science. What is the status of those efforts to build a user community for these facilities?

Dr. Orbach. FES and NNSA have established a Joint Program in High Energy Density Laboratory Plasmas (HEDLP) to coordinate their research activities in this area. The program held its first scientific workshop in May 2007. In March 2008, FES and NNSA initiated a charge to the Fusion Energy Sciences Advisory Committee (FESAC) to identify research opportunities in this area. The program is just about to release its first joint solicitation of proposals competing for FY 2009 funds using peer reviews. In the FY 2009 Congressional Request, about $4 million worth of existing projects of a high energy density plasma nature have been consolidated into the HEDLP program, and about $5 million of new money is being requested in its FY 2009 Congressional Request. We anticipate that these efforts will grow the user communities for the HEDLP facilities.

QUESTIONS FROM CONGRESSMAN HOBSON

FUSION ENERGY SCIENCE

Mr. Hobson. DOE is pursuing fusion in the lab through both magnetic confinement and inertial confinement. While the separate programs of the Office of Science and the NNSA have other significant motivations, they both represent a significant investment in a potential future energy technology.

What is that total investment, and how does it compare with the investments being made in renewable, nuclear, and fossil energy?

Dr. Orbach. In FY 2008, FES is spending about $16 million in high energy density laboratory plasma research, most of which can be attributed towards inertial fusion energy sciences. In NNSA, the total funding for Inertial Confinement Fusion is $412 million including the construction funding for the National Ignition Facility at the Lawrence Livermore National Laboratory.

In FY 2009, the FES program is requesting $493 million for magnetic fusion research, including $214.5 million for the ITER project, and $24.6 million for high energy density laboratory plasma research related to inertial fusion energy sciences. In NNSA, the total funding requested in FY 2009 for Inertial Confinement Fusion is $421 million. FY 2008 is the last year of construction funding for the National Ignition Facility at the Lawrence Livermore National Laboratory, which is scheduled for completion in March 2009.

The FY 2009 request for Energy Efficiency and Renewable Energy is $1,255.4 million. The FY 2009 request for Nuclear Energy is $1,419.5 million. The FY 2009 request for Fossil Energy is $1,126.9 million.

Mr. Hobson. When might fusion energy begin contributing to the world's energy supply?

Dr. Orbach. Investment in commercializing fusion energy first requires demonstration that a burning plasma can be created, controlled and sustained through either magnetic or inertial confinement. No one in the world has demonstrated that ability yet. Currently, the Office of Science is developing the underlying science and engineering insights needed as the foundation for a future commitment to a fusion energy development program. ITER, along with a strong materials and fusion engineering sciences research program supported by new testing facilities, will produce the necessary information that will enable a tokamak- based DEMO to be built after ITER. In addition, other major facility investments may be required if some non-tokamak concept proves to be scientifically better. Commercialization of attractive fusion power could begin by mid-century. The rate at which commercial fusion power plants would be deployed after the 2050 time frame is dependent on many variables that are difficult to know at this time.

QUESTIONS FROM CHAIRMAN VISCLOSKY

FUSION ENERGY SCIENCE

Chairman Visclosky. Dr. Orbach, your FY 2009 budget request for fusion energy sciences supports increased funding for the National Compact Stellarator eXperiment (NCSX) at Princeton Plasma Physics Lab (PPPL) in New Jersey. As you point out in your request, the project is nearly three years behind schedule and has been rebaselined twice, with the most recent estimate 69% greater than its initial estimated project cost. As the Secretary heard us discuss in great detail, we are very concerned about project management across DOE, and we would like to explore this issue with you.

What is the scientific value of this experiment, and is it still worth carrying out given the delays and cost overruns?

Dr. Orbach. As a leading alternative confinement concept, NCSX has significant scientific value in exploring diverse approaches to fusion plasma confinement; however, this value will be weighed carefully against the delays and cost overruns to determine whether to proceed with the project. The proposed increase in FY 2009 maintains the project. However, if the decision is made not to proceed with NCSX, the significance of stellarator research for fusion applications will remain high and the loss of NCSX would need to be mitigated by research, albeit at a less aggressive scale. A final DOE decision on the fate of NCSX is expected very soon. If DOE decides to cancel the project, the requested FY 2009 funds for NCSX would primarily be needed for closeout costs and support for stellarator research using smaller facilities. In addition, we would propose to use some of the requested FY 2009 NCSX funds for addressing the chronic under-utilization of our three major fusion facilities. Termination of NCSX, however, would come at a high scientific cost. As the only Proof-of-Principle-scale device in the U.S. that addresses quasi-symmetry, NCSX is capable of examining key stellarator issues in an integrated context.

Chairman Visclosky. Could you help us understand what has led to these issues, and outline the steps you are taking to deal with this issue?

Dr. Orbach. The predominant reason for the deviation from the DOE approved baseline is that the earlier estimates did not reflect adequate understanding of the cost associated with the complexity and tight mechanical tolerances necessary to meet the requirements of this first-of-a-kind stellarator. Furthermore, a lack of sufficient design development when the project was baselined led to a project estimate which underestimated significantly the actual cost and schedule needed to complete the project.

In order to deal with this issue, a number of steps were taken. First, PPPL was instructed to perform a "bottoms up-estimate" to complete the project including accelerating design activities in order to have higher confidence in the estimates. Both Princeton University and the Office of Science conducted separate reviews in 2007 to determine the status of the technical, cost and schedule aspects of the project. Given the concerns the DOE had

about the management of the project, as well as its complexity, Princeton University has brought in a more experienced project manager and conducted a constructability and maintainability review. So far, these reviews have not found any "show stoppers" to continuing with this project. Another set of technical, cost and schedule reviews were held in March and April 2008, first by the University and then the Office of Science. Currently, DOE is analyzing the results of its review and expects to make a final decision very soon on whether or not to proceed with NCSX. If we decide to proceed with the project, a final set of reviews by the University, the Office of Science, and DOE's Office of Engineering and Construction Management will be conducted probably in Fall 2008 that will establish a new baseline for the project.

Chairman Visclosky. Another part of DOE, Fossil Energy, recently "restructured" FutureGen, another program that was behind on schedule and over on cost. Why shouldn't your office take a similar approach to the NCSX?

Dr. Orbach. The situation is different between these two activities. FutureGen was restructured as a pure commercial demonstration rather than a "living laboratory" demonstratation/R&D project. We can not "restructure" NCSX. It is much too far along in its fabrication of key components and systems to change. NCSX has significant scientific value; however this value must be weighed carefully against the total costs and schedule for completing the project. When we complete our analysis later this spring of our recent project review, then we can determine the benefit versus the cost. In addition, we must weigh continuing with the National Spherical Torus Experiment (NSTX) which is an operating experiment similar in size to NCSX at PPPL versus continuing with NCSX since to provide the funding for the additional NCSX costs, NSTX would be put into a cold/safe and permanent shutdown state. The shutdown would start in the FY 2010/2011 time frame

Chairman Visclosky. Have you made a final decision on the fate of the project?

Dr. Orbach. DOE is currently analyzing the results of our recent review and expects to make a final decision very soon.

BASIC VS. APPLIED SCIENCES AT DOE

Chairman Visclosky. Dr. Orbach, your request for the Office of Science this year calls for an increase of $749 million for basic science that will underpin future developments in energy technology over the next century. On the other hand, the DOE budget request cuts funding for all the energy technology programs (with the notable exception of nuclear energy) which might have a substantial impact on our energy system in the near to mid-term. These cuts come at a time when the price of oil hovering around $100 a barrel, scientists are telling us that immediate action is needed to confront the specter of climate change, and the best analysis indicates that a broad portfolio of energy options need to be vigorously pursued in short order to address our energy issues. In your role of Under Secretary for Science, you have been tasked with advising the Secretary on scientific issues relevant to all the mission objectives of the department, not just the science mission, and I'd like to understand your view regarding the appropriate balance between funding for basic and applied research.

Do you believe that the energy technology offices have adequate funding for applied science research in this budget to make use of basic science results? Wouldn't a more balanced approach to basic and applied energy science and technology R&D be more effective in both addressing our near and long term energy challenges?

Dr. Orbach. The President's request is a balanced approach. The challenges in energy demand and energy security that we face now and in the future are daunting. There is no silver bullet—no single energy technology is going to meet these challenges—and current technologies will not suffice. Breakthroughs in science are essential to fuel the development of more efficient and cost-effective processes across all our technological projects, but also for the development of fundamentally new energy technology concepts.

Imagine solar photovoltaics with greater than twice the efficiency of current technology and the capability to directly convert sunlight to chemical fuels through artificial photosynthesis. Imagine better energy storage technology enabling solar and wind to provide over 30 percent of the electricity consumed in the U.S. Imagine the number of all-electric and plug-in hybrid vehicles on the road exceeding gasoline-powered vehicles. Imagine a closed fuel cycle for nuclear power and bringing the power of the sun and the stars to Earth in the form of controlled fusion energy. In order to realize these possibilities and seize the opportunities before us in the mid- to long-term, we must make investments in basic research now.

There are significant scientific barriers to overcome to develop significantly more efficient and cost-effective technologies, and also address carbon dioxide emissions. These barriers and critical basic research areas were laid out in a series of scientific workshops conducted over that past six years with broad participation from scientists and engineers from universities, national laboratories, and the private sector. These workshops assessed barriers for energy technologies such as solar, biofuels, hydrogen, and advanced nuclear energy systems; but also crosscutting research areas such as catalysis, superconductivity, electrical energy storage, and materials under extreme

conditions. Advances in understanding materials under extreme conditions and the resulting development of new materials, for example, would impact a broad spectrum of energy applications, including nuclear power, fusion energy, fuel cells, and concentrated solar power, where materials must perform under high temperature, pressure, and radiation environments. We also need to better understand the geosciences behind long term nuclear waste and carbon dioxide storage. The workshops have helped inform priority research investment decisions by the Office of Science to focus on areas that have the greatest potential for impacts.

Let me give you one example of where our basic research provided the foundation for an energy technology now embraced by industry. Fundamental studies by A123 Systems of the electronic conductivity of lithium iron phosphate led to the discovery of doping-induced conductivity increases of eight orders of magnitude and development of high power-density lithium ion batteries. Basic Energy Sciences support helped establish the proof-of-concept for this new nanophase material, which then enabled A123 Systems to receive early technology development and demonstration support from DOE's Office of Energy Efficiency and Renewable Energy. A123 System's lithium ion batteries are now used to power electric vehicles such as the Chevy Volt and electric vehicles produced by Th!nk.

The request for the Office of Science covers a portfolio that enables continuous transformational discoveries for energy security. Of the $749 million increased requested in FY 2009, $100 million is for new Energy Frontier Research Centers. These centers will focus on the innovative basic research needed to accelerate scientific breakthroughs to created advanced energy technologies for the 21st Century. We are encouraging the Nation's creative and intellectual talent from universities, national laboratories, and the private sector to come together to tackle some of our greatest scientific challenges identified in the scientific workshops discussed above. Awards will be $2-5 million per year for an initial 5-year period. More information on the centers is available at http://www.sc.doe.gov/bes/EFRC.html.

A $203 million increase is for ITER—the experimental fusion reactor designed to lead to development of commercial fusion energy. Fusion has enormous potential as an abundant, carbon-free power source cost-competitive with nuclear and coal power. But there are scientific hurdles to overcome in fundamental understanding of plasma science, development of materials for the extreme thermochemical environments and high neutron flux conditions, and predictive capabilities for optimum experimental reactor design. ITER will demonstrate the technical and scientific feasibility of a sustained fusion burning plasma.

A $136 million increase is for construction of next generation facilities such as the National Synchrotron Light Source II at Brookhaven National Laboratory, the Linac Coherent Light Source at the Stanford Linear Accelerator Center, and the 12 GeV Upgrade of the Continuous Electron Beam Accelerator Facility at the Thomas Jefferson National Accelerator Facility. These scientific tools for the research community will offer unmatched capabilities for the study and characterization of matter and materials at the

molecular, atomic, and quantum scale. The technologies of the 21st Century will be rooted in the ability to direct and control matter at this level.

A $71 million increase supports more optimal operations of the Office of Science's major scientific user facilities. These facilities are used annually by over 21,000 researchers from universities, the national laboratories, and industry. This suite of facilities and instruments are a pillar of the U.S. scientific enterprise and the envy of the world.

A $265 million increase is for research, including high performance computing with applications that underpin the entire Office of Science portfolio; improved climate modeling and environmental measurement to ultimately inform decisions on climate and technology investments; chemistry and materials sciences; plasma sciences; fundamental systems biology for energy and environmental applications; and high energy and nuclear physics.

The Office of Science budget request provides for world-leading research and research facilities and tools that will drive transformational discoveries not only for scientific breakthroughs needed to create advanced energy technologies for the 21st century, but that will help maintain U.S. leadership in science and innovation. The U.S. has been a leader in high energy physics and nuclear physics over the past several decades. Unless we maintain strong programs in the U.S., we stand to lose U.S. intellectual talent in these and related fields to other countries, as well as students, scientists, and engineers from other countries who would no longer view the U.S. as a destination for world-leading science. These areas of science have historically provided discoveries, fundamental breakthroughs, and technologies with broad impacts on other areas of science and technologies that are an integral part of society today—technological tools and solutions for medicine; fundamental knowledge in physics, chemistry, and materials for today's technology devices; and the instruments and tools that enable researchers to understand how nature works and use that knowledge for new solutions to society's challenges. This requested investment in facilities and research at universities and national laboratories is also essential for cultivating the science and technology workforce needed to meet the future challenges in energy, environment, and national security, and for enabling the U.S. to remain globally competitive.

The Office of Science FY 2009 request is consistent with the Energy Policy Act (EPAct) of 2005 as well as provisions in both the America COMPETES Act and the Energy Independence and Security Act (EISA) of 2007, which Congress has expressed strong support for.

BASIC VS. APPLIED SCIENCES AT DOE

Chairman Visclosky. Does this budget provide sufficient funding for long term applied science? Do you believe that the Energy Frontier Research Centers you have proposed might play a role in addressing some of the gaps in funding that we see for applied science research?

Dr. Orbach. Yes, the FY 2009 request for the Department provides the appropriate funding for long-term applied science. The Energy Frontier Research Centers (EFRCs) are expected to support long-term basic research with the aim of establishing the knowledge foundations on how nature works in order to understand and control matter at the quantum, atomic, and molecular levels—the same levels that energy is generated, stored, transferred, and utilized; but should also realize shorter term impacts in the 5 to 10 year timeframe. EFRCs will focus their efforts on improving the understanding of underlying science so that technology offices can more efficiently utilize that new knowledge— and as such they are not a substitute for, but rather an essential complement to applied research. The work will be coordinated with the applied research supported by the DOE technology programs.

BASIC VS. APPLIED SCIENCES AT DOE

Chairman Visclosky. Given our need to address climate change and energy security issues both in the short term and long term, do you - as a scientist - agree with the priorities reflected in the overall budget request for DOE - to focus primarily on long-term basic research and nuclear energy while neglecting energy efficiency and renewable energy? If so, what is your rationale for this belief?

Dr. Orbach. Yes, I support the priorities put forward in the overall budget request for DOE. However, I would note that basic research is not limited to "long-term" impacts. Basic research seeks new understanding of how nature works—from the subatomic scale to the systems biology scale. But that understanding can—indeed, is expected to—impact technology and policy decisions in the near term, the mid term, and the long term. We expect that the research at the new SC Bioenergy Research Centers will have impacts in 2 to 5 years. Experimental and computational research in climate will provide the information needed by policy makers in the same time period. Research at the proposed Energy Frontier Research Centers should have an impact in 5 to 10 years. And some research, such as that at the international ITER program activities, which seeks to demonstrate a sustained burning plasma, will have impact in a period beyond 15 years. Regardless of the time frame for societal impact, I have ensured that the research portfolio supported by the Office of Science is coordinated with the appropriate activities in the technology offices in order to remain relevant to society's needs.

BASIC VS. APPLIED SCIENCES AT DOE

Chairman Visclosky. DOE is working on development of a microelectronic artificial retina to enable the blind to see. While the promise of such devices is truly miraculous, what are the prospects that such devices will be affordable for provision to the blind broadly? Why are we doing this work in DOE?

Dr. Orbach. Artificial retinas (or retinal prostheses) use electrical stimulation of the retina producing form vision in the visual cortex to restore some functional vision to the patient. These devices, initially targeting retinitis pigmentosa patients (200,000–300,000 in the U.S.), could provide benefits for all forms of outer retinal degeneration, including dry age-related macular degeneration which affects about 2 million Americans. This technology could also be adapted to produce a viable treatment for nearly all forms of blindness through direct stimulation of the visual cortex. Current technology will target patients who have lost essentially all vision. Even future generations of the technology are not likely to provide benefit for patients with better than 20/400 visual acuity.

The cost of the device is expected to be similar to that of other advanced electrically active implantable devices already approved for commercial use by the FDA. Like these other devices, as the technology diffuses into the market and clear benefits are demonstrated, it is expected that the cost of implants will be largely covered by health insurers. To ensure that the retinal devices built by this joint DOE/NIH program are widely available, the DOE National Laboratories and universities funded by this project have signed intellectual property agreements with a U.S. company *Second Sight Medical Products* that specializes in prosthetic devices for the blind.

At least four companies around the world, including *Second Sight Medical Products,* are developing retinal prosthesis to address this unmet market need.

The unique resources and expertise at the DOE National Laboratories in engineering, microelectronics, microfabrication material science, and computational modeling and DOE's experience in managing multi disciplinary research have been essential in the overall success of developing and building the first two prototype devices that are currently being tested in blind patients. The National Eye Institute (NEI) at the National Institutes of Health and the DOE's Office of Biological and Environmental Research in the Office of Science have partnered to develop an artificial retina prosthetic. The NEI supports the biological and patient studies and DOE supports instrumentation development at six DOE National Laboratories.

BASIC VS. APPLIED SCIENCES AT DOE

Chairman Visclosky. Dr. Orbach, the Office of Science is playing a significant role in addressing questions relating to energy, particularly in the materials and biological sciences. What is the distinction between research that is done in your office and that done in the three energy technology offices of DOE?

Dr. Orbach. The work supported by the Office of Science focuses primarily on long-term high risk, high-reward fundamental research with the aim of understanding and controlling matter at the quantum, atomic, and molecular levels—the same levels that energy is generated, stored, transfer, and utilized. Such knowledge is critical in addressing the current technology gaps and in spawning new concepts for future generation of energy technologies. The research portfolios of energy technology offices focus primarily on taking existing or emerging technology concepts to higher level of performance in meeting specific technical milestones. For example, in the areas of materials research, Office of Science supports long-term fundamental experimental and theoretical research to provide the knowledge base for the discovery and design of new materials with novel structures, functions, and properties. The goal of the research is to generate new knowledge and understanding that may impact a broad range of scientific disciplines and energy applications. In comparison, the materials research programs supported by the technology programs focus primarily on specific energy applications with the goal of meeting technical targets in performance, cost, manufacturability, and durability.

The Department's R&D integration activities also recognize the proper roles of science programs and technology programs. Science can search for and respond to high-risk, game-changing scientific developments that have the potential to create transformational technology platforms. Science also seeks solutions to the longer-term scientific issues that challenge multiple technology platforms (e.g., materials in extreme environments, basic biological processes in plants and microbes that form the basis of renewable biomass, control of energy and charge transduction in solar energy conversion, etc). Technology programs focus on improving the performance and reliability of existing technology platforms towards specific near-to-mid-term goals. By housing science programs and technology programs in a single agency, DOE brings the strengths of both types of programs to bear on solving our Nation's energy security challenges.

For example, the Office of Science supports a basic research program in solar energy conversion at the National Renewable Energy Laboratory (NREL) that includes fundamental research into novel photovoltaics and the direct photocatalytic conversion of sunlight to chemical fuels, mimicking the natural photosynthetic system. The research related to novel photovoltatics covers key research topics in isoelectronic co-doping for bandgap tailoring, epitaxial growth of thin films and superlattices, structural ordering and defects in ternary alloys, predictive alloy theory to identify stable ground-state configurations, and the use of nano-structured materials for enhanced photoconversion. A recent, remarkable breakthrough is the co-discovery by the SC-supported groups at NREL and LANL of multiple exciton generation in a wide range of nano-structured,

semiconductor materials, so-called quantum dots. Unlike conventional photovoltaic materials, in which one solar photon generates only one pair of charge carriers (an exciton) and much of the energy of the solar photon is lost as heat, these quantum-dot materials, including silicon, exhibit the ability to generate up to seven excitons upon absorption of a single photon. Much more fundamental work is required to determine how to harvest multiple charge carriers in a real photovoltaic device. That work is beginning at NREL with SC-supported researchers working in synergy with those supported by Energy Efficiency and Renewable Energy (EERE). The promise of solar cells based on multiple exciton generation is enormous – a solar cell that converts sunlight to electricity with 50% efficiency. And it is based on fundamental research on the interaction of light with nano-structured materials.

BASIC ENERGY SCIENCES

Chairman Visclosky. The increases being contemplated for the basic energy sciences are extraordinary for a single year. Can this money be wisely spent so quickly – can you really hire that many qualified individuals and ramp up that many scientific projects without lowering standards or wasting money?

Dr. Orbach. The increase in the Basic Energy Sciences (BES) FY 2009 budget request is $298.4 million. Of this increase, $178.3 million is for research activities that require ramp up of scientific projects and support of researchers. The $120.1 million portion of the BES increase is for restoring optimal operations to the four light sources, three neutron sources, and five Nanoscale Science Research Centers and for planned facilities construction activities that are well itemized and documented in the budget submission. The increases in facilities operations and construction do not involve ramp up of scientific projects.

The Department is certain that the requested increase for scientific research in BES will be spent wisely. These new efforts will harness basic discovery research to enhance long-term U.S. energy security and protect the global environment in the century ahead. The Energy Frontier Research Centers (EFRCs) will be initiated with a $100 million portion of the requested increase. The new EFRCs will represent about 15 percent of the total funding for research in the BES program in FY 2009. Another portion ($60 million) of the increase will be for a complementary research program supporting individual investigator and small-group awards. The remainder of the research increase will be used for a modest increase in nanoscale science across the BES core programs and to ramp up efforts in accelerator and detector R&D that are vitally important to effective use of Office of Science user facilities. In total, the BES FY 2009 budget request provides balanced opportunities for researchers at universities, DOE laboratories, for-profit companies, and nonprofit entities as individual investigators, as small groups, and as part of an EFRC.

In anticipation of receiving the requested research increases in FY 2007 and FY 2008 appropriations, BES issued four major solicitations in solar energy utilization, hydrogen research, advanced nuclear energy systems, and mid-scale instrumentation in FY 2007. Over 700 research proposals were received. Because of the limited funding available in FY 2007, however, only 40 awards were made; most of the remaining proposals were held for funding consideration in FY 2008. Over 200 proposals would have been funded under the FY 2008 request; however, all of the remaining proposals were declined under the actual appropriation.

The Energy Frontier Research Centers (EFRCs) proposed in the Office of Science FY 2009 budget request to Congress are based on the Basic Energy Sciences Advisory Committee (BESAC) grand challenges report, *Directing Matter and Energy: Five Challenges for Science and the Imagination*, the 2003 BESAC report, *Basic Research Needs to Assure a Secure Energy Future,* and the series of ten follow-on "Basic Research Needs" workshops over the next five years, which are available on the Internet at:

http://www.sc.doe.gov/bes/reports/list.html. The complementary effort supporting single-investigator and small-group research contained in the FY 2009 budget request are also based on this set of workshop reports, with the addition of specific opportunity for mid-scale instrumentation to provide critical tools for grand-challenge and use-inspired basic research.

These huge responses to the science and energy initiatives announced by the Administration and authorized by Congress represent an astounding level of interest and commitment from the scientific community. Our Nation's brightest minds and most talented researchers are chomping at the bit to solve the tough problems necessary to ensure our energy security. Congressional appropriations for the Basic Energy Sciences program at the FY 2009 requested level of funding would put the Office of Science back on track to pursue the fundamental understanding necessary to help meet the global need for abundant, clean, and economical energy.

Chairman Visclosky. Within the Basic Energy Sciences program, research is proposed on advanced nuclear energy systems including processes that would be a part of spent fuel recycling. What are the prospects for cleaning fuel recycling technologies and when might these be ready for implementation?

Dr. Orbach. In the long term, successful development of advanced nuclear fuel cycles depends critically on fundamental advances in fuel forms, separations, waste forms, proliferation resistance, and modeling and simulation of the overall fuel cycle. Basic Energy Sciences research, as defined in the Basic Research Needs for Advanced Nuclear Energy Systems workshop, is directed at this long-term objective—the design of completely new nuclear fuel cycles based upon a deeper understanding of the underlying chemistry, physics, and materials science. Advances in fundamental knowledge of materials behavior under irradiation and the complex chemical bonding patterns induced by f-electrons of the transuranic elements are critically important to development of new and improved cleaning fuel recycling technologies that would be ready for implementation in the near term.

Chairman Visclosky. The High Flux Isotope Reactor had major problems a few years ago; can you cite examples that demonstrate that HFIR (hi-fer) is functioning successfully now and is worthy of continued support?

Dr. Orbach. Since the High Flux Isotope Reactor (HFIR) restarted in May 2007 with an operating Cold Source, it has operated with 100 percent reliability and predictability. The Cold Source has exceeded expectations and established a new world record for a cold neutron source. The user program instruments have been oversubscribed. I believe that the user facility is functioning successfully now and is worthy of continued support.

HFIR provides the Nation with state-of-the-art neutron scattering, materials irradiation, and neutron activation analysis capabilities and is the world's leading source of elements heavier than plutonium for research, medicine, and industrial applications. The neutron scattering experiments at HFIR reveal the structure and dynamics of a very wide range of

materials. The neutron-scattering instruments installed on the four horizontal beam tubes are used in fundamental studies of materials of interest to solid-state physicists, chemists, biologists, polymer scientists, metallurgists, and colloid scientists. A number of improvements at HFIR have increased its neutron scattering capabilities on the world's brightest beams of steady-state neutrons. A super-critical hydrogen cold source, which operates at 18 Kelvin and provides world-class cold neutron brightness to instruments through four super-mirror neutron guides, has been installed in one of the HFIR beamlines. Several facility modifications have been performed to provide the new systems and infrastructure necessary to safely operate the cold source at cryogenic temperatures in a reactor environment and to enable safe and reliable transmission of the cold neutron beam to the adjacent cold neutron scattering guide hall.

HFIR has resumed operation after several infrastructure and system modifications. In FY 2007, HFIR has operated for three complete cycles. With successful cold source operation, two small-angle neutron scattering instruments were added in 2007 and are currently being commissioned. Nearly 100 users conducted experiments at HFIR in FY 2007. In addition to neutron production, 234 experiment capsules were irradiated for medical and commercial isotope development and for fusion energy development, including for ITER and US/Japan Collaborative programs. The fully instrumented HFIR will eventually include 15 state-of-the-art neutron scattering instruments, seven of which will be designed exclusively for cold neutron experiments. Particularly prominent in the cold neutron guide hall are the two small-angle neutron scattering (SANS) instruments, each terminating in a 70-ft-long evacuated cylinder containing a large moveable neutron detector. In addition to the instruments, laboratories are equipped for users to prepare samples. The cold source increases the available neutron flux from 4 to 12 Å. For neutron scattering experiments, it's ideal to match the wavelength and energy of the neutron to the length and energy scales, respectively, of the materials under investigation. Therefore, for studying large-scale structures (e.g., molecular organization, nanopore-size distributions, and aggregate size and shape) and low-energy excitations (e.g., excitations in frustrated systems and various problems in magnetism, superconductivity, and correlated electron systems), the best neutrons are those with long wavelengths and low energies—cold neutrons.

NATIONAL SYNCHROTRON LIGHT SOURCE II (NSLS-II)

Chairman Visclosky. Dr. Orbach, your budget request includes $66 million to initiate construction on the National Synchrotron Light Source II. It also notes that a final decision to go ahead with construction has not been reached.

When will this decision to proceed be reached?

Dr. Orbach. Submission of a FY 2009 budget request for the total project cost of the National Synchrotron Light Source II (NSLS–II) was approved by the Department in its Critical Decision 2 in January 2008. Critical Decision 2 set the project cost and schedule, which includes construction funding. Critical Decision 3 for NSLS–II is scheduled for December 2008, which formally approves start of construction activities under DOE's directives for project management.

Chairman Visclosky. Why should Congress appropriate funds to construct a major asset when the final decision to actually move ahead has not been made?

Dr. Orbach. The decision to move ahead on the NSLS–II project was made under Critical Decision 2 in January 2008. The appropriation of the requested construction funds for FY 2009 will ensure that the project can be completed on time and within budget according to the NSLS–II data sheet submitted with the FY 2009 budget request. Key project activities are scheduled to begin in FY 2009, such as critical experimental facilities R&D activities, completion of the initial linac design activities, and site preparation activities. The risk of cost and schedule overruns to the project increases substantially as these preparation activities are delayed. If construction funding is not appropriated in FY 2009, then construction activities cannot begin when Critical Decision 3 is reached in December 2008, and the cost and schedule NSLS–II project will increase.

BIOLOGICAL AND ENVIRONMENTAL RESEARCH

Chairman Visclosky. Dr. Orbach, could you provide an update on the status of the three bioenergy research centers which were awarded last year?

Dr. Orbach. All three DOE GTL Bioenergy Research Centers (BRCs) are up and running today and engaged in cutting-edge basic research needed to develop cost-effective methods of producing cellulosic biofuels.

Secretary Bodman announced the award of the three BRCs on June 26, 2007, following an open competition and an intensive scientific merit review process. From July through September, DOE negotiated with the lead institutions of the selected BRCs on the terms and conditions of the awards. These negotiations were concluded before the end of FY 2007, and each of the BRCs received $9.97 million in FY 2007 funds to accelerate their start-up. The Department plans to provide each BRC with $25 million per year through FY 2012, for a total five-year program investment of $405 million.

The three BRCs are the BioEnergy Sciences Institute (BESC), led by Oak Ridge National Laboratory (ORNL) and based on the ORNL campus, in Oak Ridge, TN; the Great Lakes Bioenergy Research Center (GLBRC), led by the University of Wisconsin-Madison (UMW) in partnership with Michigan State University and based on the UMW campus in Madison, WI; and the Joint BioEnergy Institute (JBEI), led by the Lawrence Berkeley National Laboratory (LBNL), and located near Berkeley, CA. All three BRCs represent multi-institutional partnerships. Partner institutions include universities, DOE National Laboratories, private firms, and one nonprofit.

DOE will evaluate the performance of the BRCs on a yearly basis. The Department conducted an early Technical and Management Review of the BRCs in November 2007. As a result of the review, all three BRCs have put in place strong management plans and systems and have established clear sets of scientific milestones and deliverables to focus and guide their research programs.

The BRCs are geographically dispersed, with scientific approaches that are complementary and synergistic. All three BRCs are using the advanced genomics-based techniques of modern systems biology to re-engineer both plants and microbes for more efficient biologically-based conversion of plant fiber into fuels.

BESC is focusing on the central problem of "recalcitrance," i.e., overcoming the resistance of plant fiber, or lignocellulose, to degradation into sugars that can be converted into fuels (usually by fermentation). Research by BESC investigators has shown that recalcitrance of plant fiber forms the major cost barrier to achieving commercially viable production of cellulosic ethanol and other fuels from lignocellulose.. On the plant side, BESC is using systems biology to develop a deeper understanding of cell wall biosynthesis in order to modify poplar and switch grass genetics to improve digestibility. They are targeting primarily on the genes that synthesize cellulose and hemicellulose as well as the genes that regulate their expression, using a variety BESC is

focusing directly on the bioenergy crops of switchgrass and poplar as well studying the microbes that can degrade them, attempting to re-engineer both the plants and microbes to facilitate degradation. BESC's longer-term objective is to achieve "Consolidated Bioprocessing," or combined degradation and fuel synthesis in one step, using a re-engineered microbe or community of microbes.

GLBRC, in addition to focusing on recalcitrance of plant fiber, is pursuing the alternative approach of engineering plants to produce more starches and oils. These substances can be more readily converted to fuels. GLBRC points out that a 20 percent increase in plant oil content could nearly double the fuel yield from plant biomass. GLBRC, reflecting its affiliation with universities with strong agricultural programs, is focusing on re-engineering a wide variety of plants as well as microbes that can degrade plants and produce fuels, and they are investigating the sustainability of biofuel production. GLBRC plant researchers (mostly located at the Plant Research Laboratory at Michigan State University) are pursuing in-depth, genomics-based analysis of the complex process of cell wall biosynthesis to find methods of inducing more starch and lipid production in these structures. GLBRC is also engaged in bioprospecting and metagenomic analysis of microbial communities using somewhat different techniques and focusing on samples from Costa Rican rain forests. GLBRC is utilizing the technique of directed evolution (accelerated by a new generation of genomic sequencing technologies now available at the DOE Joint Genome Institute) to optimize microbes for ethanol production.GLBRC experts will be addressing the production of hydrogen through microbial biorefineries.

JBEI is focusing on the widely studied "model plants" of Arabidopsis and rice (as well as some work on switchgrass), for which there is abundant genotypic and phenotypic information. JBEI believes that critical changes can be accomplished more readily in model plants and then transferred to bioenergy crops. JBEI is pursuing a novel strategy vis-à-vis lignin—a substance that occludes cellulose and forms a major barrier to deconstruction of plant fiber. Through detailed analysis of cell wall biosynthesis, JBEI is seeking to change the monomer composition of lignin, replacing existing monomers with new monomers and bonds that can be cleaved by specialized enzymes. In addition, JBEI is studying the use of ionic liquids for pretreatment, using advanced imaging technology, in an effort to overcome the limitations of current pretreatment methods, which produce chemical byproducts that inhibit enzymes used in subsequent hydrolysis and that are often toxic to the microbes used for fuel synthesis. JBEI is pursuing a series of unique strategies on microbes, including re-engineering microbes to better degrade plant fiber and to produce a range of fuels beyond ethanol that are more like gasoline. JBEI is also seeking to adapt microbes to achieve Consolidated Bioprocessing, using single microbes or microbial communities.

Chairman Visclosky. Dr. Orbach, this Committee is pleased with your decision to substantially increase funding for climate change modeling. However, we are concerned about the state of funding for the science on the ground needed to inform those modeling efforts as well as the broader modeling needed to understand their wider impacts.

Integrated assessment models, which are used to try to understand the wider impacts of climate change, as well as the impacts of various climate policy and technology options, have been receiving flat or decreased funding. As we increase funding for modeling climate change, should we not also increase our efforts to try to understand its impacts and mitigation options?

Dr. Orbach. I agree with the importance of understanding the impacts of climate change and costs and benefits of options for mitigating such change. The Office of Science the sponsor a workshop at the end of March 2008 on grand challenges in climate change research. One of the charges for this workshop is to identify the scientific grand challenges with respect to understanding and predicting the sensitivity and adaptability of ecological systems to climate change. We expect the output from this workshop to identify and prioritize areas of research that need more attention in this and other areas of climate change research, including the potential socio-economic consequences and responses. The report that comes from the workshop will be used to help guide the Office of Science's decisions as to where investments in climate change research are most needed and what the balance should be between modeling activities and empirical studies that are needed to inform the modeling efforts. We support the two major centers at the Pacific Northwest National Laboratory and at MIT that are involved in the development and application of models and methods for conducting integrated assessments of climate change, including the cost and benefits of alternative technology options for mitigating such change. The two centers have been advised to put more emphasis on understanding and modeling the impacts of climate change and the economic and environmental costs and benefits of options for mitigating such change.

Chairman Visclosky. The science relevant to the response of ecosystems to climate change, atmospheric science, and atmospheric measurement has also not been given priority, with flat funding or small increases that barely keep up with inflation. To be fair, the latter two issues are primarily the purview of NSF and NOAA. Are you coordinating with NASA, NSF, and NOAA to be sure that these models have the science input they need?

Dr. Orbach. The Office of Science sponsors major, long-term field experiments designed to improve our understanding of and ability to model the response of terrestrial ecosystems to climatic and atmospheric changes. Results from these experiments show, for example, that growth and productivity of vegetation is significantly greater in intact ecosystems exposed over 10 years to an elevated atmospheric concentration of carbon dioxide 200 parts per million (ppm) above the ambient level compared to that in comparable ecosystems exposed to ambient $CO_2$ levels. The combined exposure of forest trees to elevated atmospheric $CO_2$ and ozone concentrations alone and combined, however, show that that while elevated $CO_2$ alone stimulates tree growth and elevated ozone reduces it, the effects of exposure to the elevated concentration of the two gases combined were not additive, indicating that simple additive models may not accurately project ecological effects of multiple human-induced changes in atmospheric composition. Another example of results from a 13-year ecosystem-scale experiment in which precipitation was modified so that forest plots received either the ambient amount

of precipitation, 33% of the ambient amount, or 33 percent less than ambient show that large trees are quite resilient to a 33 percent reduction in precipitation although modest longer term reductions in growth did develop. Ecosystem response models used to forecast effects of reduced precipitation on deciduous forests indicate relatively large effects on tree growth, indicating the need to improve response models to more accurately project forest responses to future changes in precipitation that may occur with climatic changes.

The current ongoing experiments supported by DOE are nearing a logical conclusion and a workshop sponsored by DOE was held in April 2008 to identify and review the science needs for "next-generation" climate change/ecosystem experiments and the infrastructure (extant and yet to be developed) that will be necessary to address the science needs. Future decisions concerning investments in research and infrastructure to improve understanding and ability to model the response of ecosystems to climate change will be based on the outcome of this workshop and the grand challenges workshop referred to above. The Department does coordinate its efforts in atmospheric science and atmospheric measurements whenever and wherever possible with those taken by NASA, NOAA, and NSF. In many cases, the *in situ* data collected by DOE at and around its Atmospheric Radiation Measurement (ARM) facilities are complemented by satellite- and aircraft-based measurements on clouds and atmospheric properties collected by NASA and NOAA. Scientists sponsored by DOE are strongly encouraged to utilize data collected by other agencies whenever it's relevant to their research. The Office of Science programs also participate in joint field campaigns with these other agencies.

Chairman Visclosky. The basic science relevant to environmental remediation efforts - a critical mission of the department - is slated only for an increase that barely keeps up with inflation.

What is the status of these efforts and how are you working with the Environmental Management program to be sure that potentially useful results are employed in advancing the environmental missions of the department?

Dr. Orbach. The Office of Science (SC) supports basic research subprograms that provide fundamental understanding to DOE's cleanup mission including Environmental Remediation; Materials Sciences and Engineering; Chemical Sciences, Geosciences, and Energy Biosciences; and Scientific Discovery through Advanced Computing (SciDAC). Within the Biological and Environmental Research program, the Environmental Remediation subprogram provides funding to support basic research to understand, predict, and ultimately control the fate and transport of DOE-relevant contaminants in support of remediation needs at DOE sites. The Environmental Remediation subprogram currently focuses on subsurface inorganic contaminants, which remain a long-term DOE priority for both active remediation (including science in support of monitored natural attenuation) and long-term stewardship. This subprogram works very closely with the Office of Environmental Management (EM). In the area of soil and groundwater contamination, this collaboration includes regular and ongoing meetings with EM's Office of Engineering and Technology, input from EM in the development of research

solicitations and research funding decisions, and participation of SC program managers in EM review panels. We feel that, in the area of soil and groundwater, there is an effective working relationship between SC and EM program managers that advance the environmental missions of the Department.

Chairman Visclosky. Do you believe that increased funding of these efforts would be a worthy investment in terms of reducing the long term liabilities associated with the clean-up responsibilities of the Department?

Dr. Orbach. The Office of Science recognizes the importance of basic science to support many DOE program missions, including that of environmental remediation. In fact, it is likely that basic science holds the most promise for significant reductions in the long term risks and liabilities associated with the Department's mission in this area. The President's budget request for FY 2009 recognizes this need, but also balances it with competing needs within the Department. Despite the competing demands for limited funds, the President's budget request includes six R&D coordination areas, one of which focuses on radioactive waste characterization. This R&D coordination area requests an additional $16.595 million for basic research within the Office of Science. This area of research has been identified as a priority for the Office of Environmental Management in managing high-level radioactive waste, as well as for the development of permanent solutions to the cleanup and long-term storage (disposal) of nuclear waste.

Chairman Visclosky. What is the plan for follow through to the pilot radiochemistry projects being solicited in 2008 once the pilot phase is completed in 2009?

Dr. Orbach. Funding Opportunity Announcement DE-PS02-08ER08-11 solicited pilot radiochemistry projects for funding in FY 2008. We do not yet know the number and nature of applications since formal applications are due April 17, 2008. It is our intent to fund projects for up to two-years. There is no plan for extending the pilot phase of these projects beyond the originally funded maximum project period of up to two years. Depending up research progress, availability of funds, and consistency with programmatic priorities outlined in the FY 2009 President's Budget, there may be future Funding Opportunity Announcements in FY 2009 and beyond for radiochemistry research, to which the radiochemistry pilot project grant awardees could respond.

NUCLEAR MEDICINE AND MEDICAL ISOTOPE PROGRAM

Chairman Visclosky. The President's budget proposes the transfer of the radioisotopes program from Nuclear Energy to the Office of Science. Last year's budget for the Office of Science proposed elimination of the nuclear medicine program. This would indicate that Science is not a supportive environment for the radioisotopes effort. Dr. Orbach, what is your plan for the overall effort in nuclear medicine, including the production of isotopes needed for research generally?

Dr. Orbach. The Office of Science recognizes the importance of the Isotope Production and Applications Program and its significance to the Nation. The focus of this subprogram will be on supporting the research and development, and production of stable and radioactive isotopes, and making them more readily available to respond to the needs of the Nation. Support will be provided in the Office of Nuclear Physics for the production of a broad suite of isotopes, important for applications in science, energy, medicine, industry, and national security. A major objective of this program will be to improve the availability and reliability of research isotopes at predictable prices needed for medical, national security, and industrial applications. A portfolio of research isotopes will be established with guidance from scientific advisory committees, in consultation with relevant federal agencies and the research community interested in using stable and radioactive isotopes.

The DOE Office of Biological and Environmental Research (BER) will support fundamental radiochemistry and imaging instrumentation research, capitalizing on strengths and resources at DOE National laboratories, to develop innovative technologies for imaging plant and microbial metabolism related to BER mission specific needs. BER will continue to support low dose radiation research aimed at informing the development of future national radiation risk policy. This BER mission relevant research will continue to generate fundamental radiochemistry and imaging technologies that will also be available to and that will advance nuclear medicine and other research activities by both the public and private sectors for their mission-specific applications, including National Institutes of Health needs.

BER and NP have begun working with NIH and other agencies to more clearly define roles and responsibilities appropriate to the missions of each program and agency, which will ensure that the Office of Science remains a supportive environment for the radioisotope effort.

Chairman Visclosky. In light of recommendations from the National Academy of Sciences in regard to U.S. competitiveness in nuclear medicine, why was support for nuclear medicine dropped in last year's budget proposal and what is the plan for these efforts at DOE in FY 2009 and future years?

Dr. Orbach. In FY 2009, Radiopharmaceutical and Imaging Research will be renamed and reconfigured as the Radiochemistry and Instrumentation Research (from Medical Applications, Radiopharmaceuticals, and Imaging). This change addresses

recommendations of the National Academy of Sciences Report on State of the Science of Nuclear Medicine, entitled "Advancing Nuclear Medicine Through Innovation" (September 20, 2007) by capitalizing on DOE strengths in technology development, especially the development and use of isotopes and instrumentation for imaging, and the training of radiochemists. This research will leverage DOE strengths in advanced imaging instrumentation development by developing new methodologies for high-resolution, dynamic, and spatial visualization of biological processes in environmentally-responsive contexts and will continue to underpin technology needs of the medical research community, especially NIH.

NUCLEAR MEDICINE AND MEDICAL ISOTOPE PROGRAM

Chairman Visclosky. Dr. Orbach, the Department has requested funding for the medical isotope program in your account, rather than in Nuclear Energy where Congress provided it in fiscal year 2008.

How would you manage this program?

Dr. Orbach. The Office of Nuclear Physics would manage this program as it does its other scientific programs and facilities. The Office of Nuclear Physics has considerable experience with successfully managing accelerator facilities and the Isotope Program includes in its portfolio operations of accelerator facilities. Performance and needs of the isotope facilities would be subject to regular peer review. A community-driven strategic plan will be developed with input from the isotope community and its stakeholders. The development and production of research isotopes will be based on peer review. The Nuclear Science Advisory Committee will be engaged and involved in providing guidance to Office of Science regarding isotope production issues.

We do not anticipate significant changes to present processes whereby the Department produces isotopes for its commercial customers, who use these products for medical diagnostics and treatments or repackage them in other commercial products. The Office of Science will increase attention paid to the needs of the broad community for access to isotopes for research purposes and to competitively-awarded funding for the development and production of new isotopes for new applications.

Chairman Visclosky. Would your priority be to utilize existing DOE facilities, or to make this support available to a wider base, including universities?

Dr. Orbach. The Office of Science Nuclear Physics program is coming into this with a fresh perspective. Everything will be considered, including direct support for isotope production and development to a wider base, including universities. A workshop is being planned for later in the summer that will bring the isotope community, and agency and industrial stakeholders together to discuss the needs of the isotope program and initiate the development of a community-driven strategic plan. Support for research isotope development and production will be based on peer review.

Chairman Visclosky. How would you ensure that the operation of your program does not crowd out similar work in the private sector and in universities? Is the proper role of the Office of Science to actually produce medical isotopes, or to research technologies for the next-generation of isotope production?

Dr. Orbach. The Isotope Program produces isotopes only where there are no commercial suppliers—and that will not change with transfer of the program to the Office of Science. If an isotope is currently available through the private sector, the Isotope Program is prohibited from competing unless the isotope is in short supply. The focus is to develop and produce isotopes that are important for research and applications

in science, energy, medicine, industry, and national security, which are not currently available in adequate supply by other sources. When an isotope becomes commercially viable, a private sector producer can petition the Department to cease production and distribution of that specific isotope. The NP program has the expertise and experience in operating facilities and developing technologies that are relevant to the production of stable and radioactive isotopes. The transfer of the Isotope Program into the Nuclear Physics program will optimize existing synergies within these two communities, and create new opportunities for collaboration which will benefit both programs and the productivity of the Isotope Production program.

Chairman Visclosky. The GAO has previously criticized the Department for not fully recovering its costs in the medical isotope program. How would you remedy that situation?

Dr. Orbach. As part of the transfer to Office of Science, the Office of Nuclear Physics intends to reconsider the current pricing policy for isotopes, in particular that of research isotopes in order to increase their availability for research, consistent with applicable law and funding requirements.

WORKFORCE DEVELOPMENT FOR TEACHERS AND SCIENTISTS

Chairman Visclosky. Dr. Orbach, this Committee is pleased to see the increased investment you have proposed for Workforce Development, which is critical to our long term competitiveness. Further, we found the detailed accounting of educational activities provided with your request, corresponding to a total investment of $36 million, very illuminating. In this vein, the America COMPETES Act authorized a number of educational activities for the Department. Please provide, for the record, an assessment of these activities and an accounting of which of these activities are funded in your request.

Dr. Orbach. The Office of Science is supporting several programs that are consistent with the intent of the America COMPETES Act. These include the DOE Academies for Creating Teacher Scientists (DOE ACTS) program which is in line with the summer institutes authorized in the Act; the Outstanding Junior Investigator award programs and the Office of Science Early Career Programs which are consistent with the early career award programs authorized in the Act; the Faculty and Students Teams Program which is consistent with the programs for minority students authorized in the Act; and research centers, including the DOE Bioenergy Research Centers, the SciDAC Centers for Enabling Technologies at national laboratories, and the Energy Frontier Research Centers which are consistent with the discovery research centers authorized in the Act. These programs are all supported in the FY 2009 budget request.

In addition to the programs identified above, the Office of Workforce Development for Teachers and Scientists within the Office of Science, working with the other Office of Science program offices and the national laboratories, continues to build the Office of Science's efforts in increasing participation of historically underrepresented populations, and improving the laboratories' capacity to bring experiential learning opportunities to the educational institutions in their respective regions.

COMPETITION

Chairman Visclosky. Please explain why your office recently cancelled the competition for the contract for the Pacific Northwest National Laboratory.

Dr. Orbach. The draft Request for Proposal (RFP) for the operation of the Pacific Northwest National Laboratory (PNNL) was issued without a contract provision for the use permit. After we issued the draft RFP, legislation was passed that required any current or future contract for the operation of PNNL to contain the use permit provision. We cancelled the RFP since it was inconsistent with the recently passed law.

Chairman Visclosky. Please explain the "use permit" at the Pacific Northwest National Laboratory. Did you believe this was necessary for PNNL, and do any of the other DOE Science labs have such an arrangement in their contracts with DOE?

Dr. Orbach. The use permit is a special contract provision that allows the contractor operating the Pacific Northwest National Laboratory (PNNL) to use the PNNL facilities and equipment for its own private work. At one time, the use permit may have been useful to help encourage private investment in the Laboratory during its early years, but we now believe the use permit is not necessary since PNNL is a well established and thriving laboratory within the DOE complex. Also, none of the other Office of Science laboratories have a use permit provision in their contracts.

Chairman Visclosky. What is the status of the contract competitions for the remaining nine Science laboratories? What have we learned from those competitions and how will those lessons factor into the next laboratory competition?

Dr. Orbach. We have considered competition for all of the contracts to operate the Office of Science laboratories and five of these contracts have already been competed and awarded. Those five are the contracts for Ames Laboratory, Argonne National Laboratory, Fermi National Accelerator Laboratory, Lawrence Berkeley National Laboratory, and Thomas Jefferson National Accelerator Facility. We are still considering competition for the remaining Office of Science laboratory contracts at the end of their current contract terms. We have learned that regardless of the number of competitors for these contracts, the Department has been able to update and improve contract provisions during these competitions. We have also added new contract terms that will better serve the Government, such as a new Award Term provision that directly ties any additional years of contract term to annual contractor performance.

LANSCE

Chairman Visclosky. Dr. Orbach, the LANSCE facility at Los Alamos is in a unique position. This is a major Science asset, yet it resides physically in the middle of a weapons lab.

What is the reporting chain of command for this facility?

Dr. Orbach. The Office of Science-supported Manuel Lujan Jr. Neutron Scattering Center (Lujan Center) is part of the Los Alamos Neutron Science Center (LANSCE). The combined facility is comprised of a high-power 800-MeV proton linear accelerator, a proton storage ring, and targets to the Lujan Center for civilian research and the NNSA Weapons Neutron Research facility for national security research. The Lujan Center Director reports to the LANSCE User Facility Director who reports through Laboratory Associate Directors to the Los Alamos National Laboratory (LANL) Director. The LANL Laboratory Director reports to NNSA.

Chairman Visclosky. Given the limitations on your authority over Los Alamos imposed by the NNSA Act, how do you ensure that this asset remains responsive to the needs of the Science program?

Dr. Orbach. The Manuel Lujan Jr. Neutron Scattering Center is funded by the Basic Energy Sciences (BES) program. The facility is subject to the same performance reviews as the other BES national laboratory user facilities. The Lujan Center management has been responsive to guidance from the Office of Science.

Chairman Visclosky. How does the user community access facilities that are at weapons labs? Are there restrictions on who at universities – such as foreign-born students – may or may not use the facility?

Dr. Orbach. The Manuel Lujan Jr. Neutron Scattering Center is not located in a security area. There are no restrictions on foreign nationals, who gain access to the Lujan Center after going through similar DOE approval steps as those at the other DOE laboratories.

Chairman Visclosky. The NNSA Act was designed to support the unique skill set and facilities necessary for our national defense. It provides unique authorities. Why should this Committee support future Science user facilities at weapons labs when they are legally not accountable to the Science office at DOE and are often difficult for the user facility to access?

Dr. Orbach. The Manuel Lujan Jr. Neutron Scattering Center provides an intense pulsed source of neutrons for civilian research to a variety of spectrometers for neutron scattering studies for measurement of high-pressure and high-temperature samples, strain measurement, liquid studies, and texture measurement. Six new instruments were developed in the last decade, and significant strides have been made at the Lujan Center

during the past several years. New sample environment capabilities complement existing strengths in high pressure and engineering stress, and the improved quality of user experiments are resulting in more scientific publications. Although the Spallation Neutron Source (SNS) will become the Nation's signature neutron scattering facility, an October 2006 workshop, "The Lujan Center in the SNS Era," concluded that a strong national neutron research program requires the SNS plus other high intensity user facilities. The Lujan Center could remain world class with a future emphasis on cold neutron instruments optimized for 20Hz repetition rate and a shift to more inelastic neutron scattering capabilities at the facility. Given the unique instruments at the Lujan Center that serve the common interests in materials sciences by NNSA and Office of Science (SC), the Lujan Center provides a special opportunity for SC researchers. Continued support of the Lujan Center by SC is contingent upon triennial peer review.

WORK FOR OTHERS

Chairman Visclosky. The DOE Office of Science is the steward for several very large-scale experimental and scientific facilities around the country, some of which can cost hundreds of millions or more to build, and tens of millions in annual operational costs. But, these facilities are often used for non-energy research by other agencies such as NIH, DOD, NSF, and private industry.

Given the President's Science Advisor's calls to diversify funding sources for research, is the current scheme adequate for the dual goals of encouraging diverse, productive use of these facilities and covering significant operational costs?

Dr. Orbach. Diversity of funding sources for research usually refers to the ability of a research performer to seek and obtain funding from a number of different federal agencies. This characteristic of the U.S. scientific enterprise has many benefits.

Diversity of funding major scientific user facilities among different agencies would substantially undercut the role of the Department in facilities planning, construction, and operations. The Department's Office of Science (SC) is currently the Nation's leader in this area, a role that will be seriously compromised if DOE no longer fully supports facility operations. Splitting the funding of the operations of large user facilities among two or more programs would mean that facilities could not run efficiently because each program could not budget facility operations with confidence. Budget shortfalls in any partner program would disrupt the marginal costs of operations of the entire facility and impact the Department's ability to accommodate beam time for users. When a single program is responsible for the large fixed costs of operations, it will be easier for facility managers to properly plan and operate their resources.

Charging user fees is also not a solution. Most research at the SC facilities is federally funded, so the effect of charging fees for nonproprietary research would be to establish a costly bureaucracy to transfer funds from one agency to another. Administrating such user fees would be expensive since each facility would have to create accounting departments to collect fees for hundred or thousands of individual experiments. Furthermore, the overhead costs would be incurred both at the institutions receiving the grant and at the facility, thus further increasing the cost of operating the facilities.

According to a National Academies report (Cooperative Stewardship: Managing the Nation's Multidisciplinary User Facilities for Research with Synchrotron Radiation, Neutrons, and High Magnetic Fields (1999) National Research Council, Washington, D.C.), "Because of the broadening of the user communities, there is pressure to expand the sources of core funding. However, history has demonstrated that if core operations and maintenance become dependent on dispersed funding, the entire facility operation may be threatened by the reduction or withdrawal of support by a single component."

Chairman Visclosky. Is there a requirement of "total cost recovery" if a private company wishes to retain intellectual property rights for work conducted on these

facilities, and do you have a sense on whether this has prevented a significant number of American companies from making good use of them?

Dr. Orbach. Researchers with proprietary interests are charged user fees at rates designed to recover the full cost of providing the service of operating our scientific user facilities. Enhanced intellectual property rights include the right to keep research results secret. The Department's policy is to provide access to the facilities without charge to all qualified researchers, including those from the private sector, whose intention is to publish in the open literature. Private companies retain ownership of new inventions they make as users regardless of whether they provide "total cost recovery." The vast majority of users do not seek enhanced rights and gain access to the facilities without charge after their proposals have passed peer review.

It is unlikely that charging full cost recovery for proprietary research has prevented American companies from using Office of Science (SC) facilities. Although many industrial users of SC facilities publish in the open literature and use the facility without charge, the full-cost recovery policy for proprietary research gives companies a mechanism to retain enhanced intellectual property rights for work at the facilities.

Charging user fees for non-proprietary work, however, would discourage industrial use of facilities. Significant industrial contributions to beam line fabrication, instrumentation, and user support will diminish or cease, thus denying the Department's leveraged use of these non-federal investments for federal as well as non-federal use.

Chairman Visclosky. Dr. Orbach, your user facilities are critical resources for our national research needs. Universities and the private sector have used them to support cutting-edge research priorities, and usually pay a fee to cover the operating costs that their experiments incur.

How much does DOE collect annually from user fees at Science facilities? What percentage of actual operating costs does this cover?

Dr. Orbach. The vast majority of Office of Science (SC) facility users do not pay fees. The total amount of users' fees collected annually at SC facilities is very small in comparison to the operating costs of the facilities. For example, DOE collected $3.4 million in user fees from the four synchrotron radiation light sources (the Advanced Light Source, the Advanced Photon Source, the National Synchrotron Light Source, and the Stanford Synchrotron Radiation Laboratory) in FY 2007, which was only 1.5 percent of the $221 million total operating costs of these four facilities. Of the 8,583 users of these four facilities, 97.1 percent or 8,289 users conducted no proprietary research during FY 2007. Only 68 users conducted proprietary research exclusively, while another 181 users conducted both proprietary and non-proprietary research at the light sources in FY 2007.

The Department's user fee policy in accordance with OMB Circular A 25, paragraph 3.2. (1) that states "where a service (or privilege) provides special benefits to an identifiable

recipient above and beyond those which accrue to the public at large, a charge should be imposed to recover the full cost to the Government of rendering that service." The open access model that the Office of Science uses for its scientific user facilities is in keeping with guidelines contained in the National Academies report, *Cooperative Stewardship: Managing the Nation's Multidisciplinary User Facilities for Research with Synchrotron Radiation, Neutrons, and High Magnetic Fields*, which states that user agreements should "achieve maximum simplicity, uniformity, and portability."

Chairman Visclosky. Are there any Science facilities where users do NOT pay a user fee?

Dr. Orbach. Users of all Office of Science (SC) facilities do not pay user fees for qualified research that is to be published in the open literature. Qualifications to use the facilities are determined by peer review. The vast majority of users of SC facilities do not pay user fees.

Chairman Visclosky. Do the facilities include any portion of such capital costs, or potential future capital costs, in the user fees?

Dr. Orbach. No, the facilities do not include capital costs or potential future capital costs in full-cost recover charges for proprietary research. Department policy requires that rates be established to recover the full cost based on a facility's operating budget and instrument capacity.

Chairman Visclosky. Given that the needs of the larger research community – including universities and the for-profit sector - often drives new capital investments, is it reasonable that taxpayers should cover 100% of new capital costs? What approach would you recommend to share this burden more fairly?

Dr. Orbach. The cooperative stewardship model the Office of Science (SC) users to manage its facilities does not preclude shared capital investments—although it does define which make sense and which may not. New facilities contain only a fraction of the beam lines they can accommodate when their experimental halls are fully instrumented over time. Consortia involving federal, university, and industrial scientists build most beam lines at SC facilities. In some cases, international collaborators bring resources for instrumentation investments at SC facilities. Each beam line costs several millions of dollars and has substantial operating costs. In exchange for beam time at the facility, these consortia provide a substantial fraction of time for independent researchers. For example, SC operates four of the Nation's six synchrotron light source user facilities. The SC facilities are the site of 178 beamlines of 212 beamlines in the nation. Of these 178 beamlines, 96 receive full operational support from SC. The other major operational support is provided by NIH (21 beamlines), universities (22 beamlines), and industry (21 beamlines). Research Institutes, NSF, Department of Commerce, and DOE EE/EM each support 3-5 beamlines. Construction funding for new facilities, which further the Nations' science and technology missions, should come from the appropriations from Congress.

WORK FOR OTHERS

Chairman Visclosky. Dr. Orbach, your laboratories aggressively pursue and perform millions of dollars of work for other agencies every year, a practice known as "work for others." We're all rightly proud of the expertise that our science facilities have developed, and we want to make that expertise available to the rest of the community...when it doesn't detract from the core Science mission. We are concerned about whether DOE bears a fair share of the cost for the expansion of lab capacities needed to perform work for other customers:

Are any of the funds that we appropriate to the labs to support DOE missions being used by the labs to market their services to other agencies or to lobby Congress for increased funding?

Dr. Orbach. Since we all recognize the DOE laboratories as a national resource, it should be expected that they communicate their capabilities that might be applicable to the specific needs of another Federal agency. This allows other Federal agencies to effectively utilize the special and unique capabilities of the DOE laboratories when it is in the best interest of the Government to do so. All lobbying costs are unallowable under the laboratory contracts.

Chairman Visclosky. When a laboratory accepts Work for Others, does it only do so when it has spare space and workforce? If not, do you ask this Committee for additional up-front funding for additional facilities and hiring new workers?

Dr. Orbach. The Department accepts work for others only when it does not interfere with DOE work. The laboratory contractor must manage its workforce and the laboratory facilities in context of the funding provided by both the DOE and non-DOE sponsors of work at the laboratory. We must recognize that over time the funding sources and amounts can vary significantly, and the contractor is responsible for effectively managing these fluctuations with as little as possible impact on the staff and laboratory facilities. We did not ask the Committee for any up-front funding for staff or facilities specifically for work for others.

Chairman Visclosky. Does DOE recover 100 percent of the costs of doing work for other agencies, including a contribution toward the cost of capital improvements?

Dr. Orbach. The Department pricing policy requires that DOE recover full costs when performing work for other Federal agencies. This full cost includes both the direct and indirect costs associated with the work being performed. While some indirect cost rates may recover costs associated with routine facility maintenance and repair, major laboratory facilities are planned for and funded through the DOE budget process.

Chairman Visclosky. Do the laboratory contracts impose any sort of ceiling on how many personnel each lab may employ? While I can understand why an individual

laboratory may want to grow in the future, is it in the best interests of the Department or the taxpayer to see these labs grow?

Dr. Orbach. The laboratory contracts do not impose a ceiling on the number of employees at a laboratory. The DOE laboratory contractors are responsible for managing their workforce to ensure they can effectively execute the DOE mission. This may require the laboratory to grow in certain areas in order to support the DOE mission needs, such as the growth required at Oak Ridge National Laboratory to support the new Spallation Neutron Source facility. Any future growth at a laboratory is determined by its need to continue to effectively support the DOE mission.

Chairman Visclosky. If a laboratory increases its staff to support work for other customers, and then those staff are no longer needed - is DOE responsible for all of the severance costs associated with those employees? Is that fair, when these employees were hired primarily to support non-DOE work?

Dr. Orbach. When performing work for other Federal agencies, the Department is required to recover the full cost of that work. That full cost includes an overhead or indirect component that covers employee benefits, including severance costs. So, the cost of severance for laboratory employees is covered by all funding sponsors of the laboratory and not just DOE.

QUESTIONS FROM CONGRESSMAN HOBSON

OVERHEAD RATES

Mr. Hobson. What are the overhead rates at your ten Science laboratories?

Dr. Orbach. The laboratory overhead rates vary across the ten Office of Science laboratories due to a variety of factors. Each laboratory overhead rate is based on the accounting system at that laboratory used to collect and report costs. These accounting systems must be consistent with cost accounting standards, but otherwise can be very different at each laboratory. The overhead rate is dependent on the base used to develop the actual rate. That is, the lower the base, the higher the rate, and vice versa. Also, the laboratories can and do reclassify costs between direct and indirect over time which will changes the rate up or down depending on the adjustment being made. For these reasons, we do not focus on overhead rates, but are now looking at the total cost of doing business at the laboratories.

Mr. Hobson. What steps are you taking to reduce these overhead rates?

Dr. Orbach. We are working with our laboratories to fully understand all the costs of doing business, including trends in overhead costs, so that we can identify and address cost drivers. As one example, we want to understand how our DOE requirements are affecting the laboratories and what might be done to minimize negative impacts. In addition, we have proposed the Infrastructure Modernization Initiative as part of our Science Laboratories Infrastructure budget. This initiative will invest in improvements to the general-purpose infrastructure at our laboratories, which will reduce future operating and maintenance costs.

Mr. Hobson. What is an equitable distribution of these overhead costs when the labs are doing work for other DOE program offices and for other agencies?

Dr. Orbach. Federal cost accounting standards require the laboratories to charge the same overhead rate for similar work at a laboratory regardless of the sponsor.

QUESTIONS FROM CHAIRMAN VISCLOSKY

SCIENCE INFRASTRUCTURE AND DEFERRED MAINTENANCE

Chairman Visclosky. Dr. Orbach, your deferred maintenance backlog at the end of fiscal year 2007 is estimated to be $518,000,000, exceeding your objective by $232,000,000. You seem to be taking a proactive approach to addressing this backlog, but your budget materials are a bit thin in describing the details.

Please explain for the Committee the steps you are taking to reduce your deferred maintenance backlog, including your proposed "Infrastructure Modernization Initiative".

If this initiative were funded, how much more quickly will you be able to achieve your deferred maintenance goals?

Dr. Orbach. We are taking a proactive approach that addresses the very ability of our laboratories to maintain their scientific leadership well into the future by pursuing an Infrastructure Modernization Initiative. Since 2006, we have increased our focus on addressing the deferred maintenance of our laboratories by setting goals for improving the overall condition of our facilities and holding the laboratories accountable for meeting maintenance and deferred maintenance reduction goals. However, we cannot assure that our general purpose laboratory infrastructure will support world class science through maintenance alone. Many of our multipurpose laboratory buildings are over 40 years old, are expensive to maintain, and may not fully meet the requirements of a modern research facility, including precise temperature, vibration, air flow, and electrical supply controls. To address the needs of our laboratories and ensure their continued vitality, we are taking an integrated approach to improving the mission readiness of our facilities, including a significant capital investment program coupled with a sound maintenance program and elimination of excess facilities. The projects proposed under the modernization initiative in our FY 2009 budget are a good sample of the approaches we plan to take with this initiative in the next ten years. These projects include the construction of new buildings, renovation of laboratory space, and disposition of excess facilities. Under the Modernization Initiative we plan to execute similar projects throughout all of our laboratories to completely revitalize our ten laboratories in the next ten years.

Chairman Visclosky. The budget for General Plant Projects declines significantly - from $35.5 million to $31.2 million - and when the infrastructure support associated with transfer of the radioisotope program is included, the decline is precipitous. Institutional General Plant Projects are proposed for an increase of $16.8 million. What is the difference between these to funding programs, is the overall level of support for this critical maintenance area dropping, and if so, why?

Dr. Orbach. Our overall support for the maintenance of our laboratories is not decreasing; the maintenance of our laboratories is an integral part of our overall modernization efforts. In the FY 2009 budget request, we are proposing a transition from funding multi-program and interdisciplinary General Plant Projects (GPP) by a

designated "landlord" program to Institutional General Plant Projects (IGPP), which are indirectly funded by all users at the site. This transition is the primary driver of the decrease in GPP funding and the increase in IGPP funding. In conjunction with this transfer of responsibility to the laboratories for small projects, we are also proposing, under the Infrastructure Modernization Initiative, to significantly increase funding for larger infrastructure projects at our laboratories. These changes are part of an overall effort to more strategically tie infrastructure investments to scientific missions, and thereby ensure that our laboratories have the infrastructure necessary to support those missions. We feel that these efforts will help to address impacts of historical underfunding of infrastructure efforts.

REALIGNMENT AT THE CHICAGO OFFICE

Chairman Visclosky. Dr. Orbach, your budget for the Chicago Office shows some significant changes among project lines. For instance, your proposed budgets for Basic Energy Sciences and Biological and Environmental Research are roughly 25% lower than fiscal year 2007. Advanced Scientific Computing Research and High Energy Physics on the other hand are increased a combined 15%.

Are you realigning the work at the Chicago Office? What is the underlying rationale for the changes?

Dr. Orbach. The differences you have noted do not reflect a realignment of work, but rather are attributable to timing. A portion of the grant funding in FY 2008 and FY 2009 that will eventually go to the Chicago Office was reflected under headquarters funding pending decisions that will be made later in FY 2008 and FY 2009. Specifically, for upcoming calls for research proposals, until university, laboratory, and other research proposals are peer-reviewed and the most meritorious selected, we do not know precisely what portion of the funding will be awarded as grants, and the funding is not reflected under the Chicago Office until that amount is known. The Chicago Office is the Department's Grants Management Center of Excellence, all SC grant awards to universities and other grantees across the country are awarded through the Chicago office. If Congress supports the overall increase to Office of Science funding in the FY 2009 request, we anticipate that final FY 2009 funding through the Chicago Office will be substantially higher than FY 2007 levels.

QUESTIONS FROM CONGRESSMAN HOBSON

WASHINGTON HEADQUARTERS FUNDING

Mr. Hobson. Dr. Orbach, funding requested for the Washington Headquarters has jumped dramatically in the last few years - from $71 million in fiscal year 2007 to $681 million in this budget request. Only $20 million is in program direction – the balance is in the program lines. Basic Energy Sciences, for instance, jumps from $2 million to $275 million over that time period, and Biological and Environmental Research goes from $1 million to $124 million.

What's the story here? Have you made a management decision to simply request funding differently, or is there a fundamental difference in the work that Headquarters manages or performs?

Dr. Orbach. Funding reflected under Washington Headquarters in FY 2008 and especially in FY 2009 largely reflects research funding held at headquarters pending competitive selection of research proposals during the execution year. Aside from program direction funding, which specifically supports work by Federal employees located in the Washington area, nearly all of the remaining funding will eventually go to universities, national laboratories, and the other locations we fund. As of the budget submission to Congress, approximately 10 percent of FY 2008 funding and 12 percent of FY 2009 funding was not yet allocated by location, and instead reflected within the headquarters total. There has been no change to the Office of Science's overall approach, and this apparent difference by year is simply due to timing.

QUESTIONS FROM CONGRESSMAN CALVERT

COMMERCIAL APPLICATION OF BASIC SCIENCE

Mr. Calvert. As you know, this committee and the Congress are concerned about the flow of technologies from the Lab to the marketplace. Although much of basic science may not see commercial application for decades, there are many new technologies and scientific advancements that should be sped to the marketplace.

What is the Department doing to ensure that collaborations with industry and its national laboratories are strongly encouraged?

Dr. Orbach. The Secretary of Energy recently signed a Secretarial Policy Statement on Technology Transfer at Energy Facilities, to "... heighten awareness of the importance of technology transfer throughout DOE." The Secretary also named a Technology Transfer Coordinator and appointed a Technology Transfer Policy Board to better coordinate the overall technology transfer activities of the DOE laboratories. The Coordinator and the Board have been tasked with overseeing and encouraging the DOE laboratories to more effectively engage industry in research and development partnerships and collaborations. These efforts indicate a continued recognition by the Department of the importance of technology transfer as a powerful means to develop commercial applications with industrial partners from basic science discoveries.

The Department's laboratories also develop collaborations with industry partners surrounding the capabilities of the laboratories' scientific user facilities and complementary research interests. In addition, the technology development and commercialization efforts supported by DOE SBIR funds enable the transition of basic research to technology applications and foster collaboration between the laboratories and industry.

Mr. Calvert. Is the Department fully committed to finding creative ways to advance industrial partnerships and collaborations?

Dr. Orbach. The Department is fully committed to finding creative ways for industry to partner and collaborate with the DOE laboratories. For instance, the Office of Science has recently created three new Bioenergy Research Centers, which represent a novel approach to laboratory, university and industry partnerships. The goal of these centers is to develop innovative approaches to create new sources of bioenergy that do not rely on corn or other food and feedstock. We are also looking to find new ways to improve the ability for industry to access our laboratories for cooperative research and development activities.

Mr. Calvert. Do you believe that the Department has the legal and financial resources available to get this right?

Dr. Orbach. We believe the Department has the legal and financial resources necessary to advance industrial partnerships and collaborations.

Mr. Calvert. How is the Office of Science utilizing the "other transactions authority" provided by the Congress?

Dr. Orbach. The Office of Science has not yet had the opportunity to use the "other transactions authority" provided by Congress.

QUESTIONS FROM CONGRESSMAN HOBSON

JOINT DARK ENERGY MISSION

Mr. Hobson. Dr. Orbach, I have been told that we have two main methods for doing high energy physics - conducting experiments at the subatomic scale on high-powered colliders such as the Large Hadron Collider and the International Linear Collider, and observing the high-energy interactions in the natural universe at the scale of stars and galaxies. In addition to the Joint Dark Energy Mission with NASA, can you tell me about some of the other DOE efforts directed at cosmology and understanding energy and matter in the universe around us?

Dr. Orbach. DOE High Energy Physics has a number of experiments that utilize observations of the universe. These experiments provide important scientific results in areas of particle astrophysics and cosmology that complement our primary accelerator-based research mission. We are partners with NASA on the Large Area Telescope (LAT), the primary instrument on NASA's Gamma-ray Large Area Space Telescope (GLAST) mission, which is now scheduled to be launched in May 2008 to search for cosmic dark matter. DOE recently signed an agreement with NASA to provide computing time at our National Energy Research Supercomputing Center (NERSC) for data-analysis for the Planck Mission. Planck is a European Space Agency (ESA) and NASA mission scheduled for launch in 2008. It will study the Cosmic Microwave Background, a signal left over from the inflationary period in the early universe.

We also provide support for some ground-based observations of cosmic phenomena. For example, the Pierre Auger Observatory is an array of ground-based detectors and fluorescence telescopes spread over a 300 square kilometer area in Argentina. DOE, NSF and about 20 foreign partners collaborated on the fabrication of the experiment. It will study ultra high energy cosmic rays, which have energies that are orders of magnitude above what current man-made particle accelerators can achieve, and so may tell us something new about particle interactions at very extreme energies.

In addition to JDEM, DOE is developing new ground-based dark energy experiments with the NSF. We are beginning fabrication of the camera for the Dark Energy Survey (DES) experiment in FY 2008. The camera will be installed on the Blanco Telescope in Chile, which is funded and operated by NSF. DES will provide the next step in ground-based observations for studying dark energy by making measurements of galaxy clusters, supernova, and weak gravitational lensing. DOE is also supporting R&D for the camera for the proposed Large Synoptic Survey Telescope (LSST) which is a next-generation, ground-based observatory in Chile to study the nature of dark energy as well as many other astronomical observations.

Mr. Hobson. This subcommittee has consistently demonstrated its support of the Joint Dark Energy Mission (or "JDEM") for many years now. We understand that NASA is very close to issuing a draft Announcement of Opportunity. I have a few questions that

underscore the interest and support this subcommittee continues to have for JDEM and the science it is meant to address:

Given that this now appears to be a NASA-led mission, are you comfortable that JDEM will yield the best science to address the science priorities of High Energy Physics?

Dr. Orbach. NASA and DOE are jointly planning the mission. Though NASA will issue the Announcement of Opportunity, we will be working with them to write the terms of the Announcement. DOE does not have the expertise to do JDEM alone, and JDEM is also part of NASA's scientific program. Therefore, it makes sense for us to partner on JDEM, with NASA leading the overall mission management. In our plan, DOE will contribute its expertise where appropriate, which is in the areas of scientific collaborations and instrumentation. DOE will work closely with NASA in selecting the winning concept for JDEM. An important part of the selection process will be to ensure that the science obtained by the concept will address the needs of both the NASA science mission and of the High Energy Physics science mission. If there are no concepts that will adequately do the science, then the agencies will go back and rethink the mission.

Mr. Hobson. Last year the National Research Council considered a number [sic] missions and experiments to advance the state of physics "Beyond Einstein." The resulting report declared that JDEM should be the top priority. Will the Joint Dark Energy Mission that results from NASA's competition be within the range of options the NRC considered?

Dr. Orbach. All three of the concepts for JDEM that were studied as part of the National Research Council's "Beyond Einstein" study are expected to compete for the JDEM mission, but there may be new proposals as well. All of the concepts that the NRC considered use optical and/or infrared observations to study dark energy. In order to keep the mission to a reasonable cost, NASA and DOE plan to solicit only a mission focused on the dark energy science using these types of observations, and not a multi-purpose mission.

Mr. Hobson. Are you confident that DOE's investment in this project to date – the country's investment in this project, that is - will be adequately utilized toward NASA's JDEM?

Dr. Orbach. DOE's investment to date is mostly in the SNAP concept and was used to do general R&D on the advanced optical and infrared sensors that would be used in the camera, as well as in designing a mission concept. This sensor development can be used towards other missions as well as by the general scientific community. The SNAP concept development funded by DOE has helped the whole JDEM mission go forward, so that it could be at a sufficient level of technical readiness for the costing studies that were done by the NRC, and so that critical decisions could be made.

Mr. Hobson. Will DOE be involved in the selection process that results from the Announcement of Opportunity?

Dr. Orbach. Yes. Although NASA will post the Announcement of Opportunity, DOE will participate in its development as well as the selection process.

QUESTIONS FROM CHAIRMAN VISCLOSKY

HIGH ENERGY PHYSICS

Chairman Visclosky. Dr. Orbach, our FY 2008 omnibus bill did not provide funding for the NOVA activity and limited funding for the International Linear Collider and Superconducting RF R&D activities in the High Energy Physics program. However, these activities are included in your FY 2009 request.

Have you formulated a plan for FY 2008 that will enable these programs to retain the capabilities they would require to carry out the activities budgeted in FY 2009?

Dr. Orbach. Yes, we have. We are in the process of re-baselining the NOvA project, taking into account FY 2008 funding, to continue the project in FY 2009 with a revised cost and schedule. We have developed new plans for both the ILC and Superconducting RF (SRF) R&D programs. The ILC R&D plan has a reduced scope that emphasizes the areas where the U.S. has unique or world-leading expertise, and where there are closer connections to other U.S. High Energy Physics program needs. We have discussed this R&D plan with our international partners, and while they are not pleased with the abrupt changes, they are adapting. The SRF R&D plan, while coordinated with the ILC R&D activities, is now focused on developing capabilities needed for the near term needs of the High Energy Physics program.

Chairman Visclosky. Will you be making a reprogramming request regarding this issue?

Dr. Orbach. We are considering a reprogramming request, but our determination depends in large part on what the outlook is for FY 2009. Reprogramming some funds would benefit all these efforts, however, we don't want to restore these programs and ramp-up effort if the FY 2009 budget for high energy physics isn't going to support a funding profile for NOvA that gets the project done in a timely way, and doesn't support the focused level of U.S. involvement in ILC R&D and the SRF activities that we have proposed in the FY 2009 Request.

PROJECT MANAGEMENT

Chairman Visclosky. The fiscal year 2008 omnibus directed the Department to manage all projects in excess of $100 million total costs in full compliance with DOE Management Order 413.3A.

Dr. Orbach, will you testify today that the Office of Science is in full compliance with this Order?

Dr. Orbach. Yes, the Office of Science is currently in full compliance with DOE Order 413 for all projects with a Total Project Cost in excess of $100 million dollars that are baselined (past Critical Decision 2).

QUESTIONS FROM CONGRESSMAN HOBSON

AMERICA COMPETES

Mr. Hobson. The America COMPETES Act authorized the creation of an autonomous Advanced Research Projects Agency for Energy (ARPA-E) within DOE to pursue "long-term and high-risk technological barriers in energy through collaborative research and development that private industry or the DOE are not likely to undertake alone."

Dr. Orbach, what are your views on ARPA-E?

Dr. Orbach. President Bush signed the America COMPETES Act into law on August 9, 2007. In a statement released after the signing, the White House noted that the COMPETES Act in many ways supports the aims of the President's American Competitiveness Initiative (ACI). However, the President noted that the Administration would not request funding for all authorizations in the Act, including ARPA-E.

However, recognizing the intent of Congress in passing ARPA-E, the Secretary asked the three Under Secretaries, including myself, and the Chief Financial Officer to review the ARPA-E statute and its directives, and to examine other possible options for implementation, given current funding constraints.

We are examining the authorizations in the legislation, and how best to integrate the goals and mission of ARPA-E with the goals and missions of existing programs of the Department, as appropriate. These efforts are well under way and are addressing the goals set for ARPA-E in the COMPETES Act. These goals are identifying and promoting revolutionary advances in fundamental sciences; translating scientific discoveries and cutting-edge inventions into technological innovations; and accelerating transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty.

For example, we are reviewing how ARPA-E relates to our already existing commercialization programs such as Small Business Innovation Research (SBIR), and we must see how our current technology transfer activities could best be used to meet of the goals set out for ARPA-E.

On June 29, 2007, I was appointed Technology Transfer Coordinator, in accordance with Energy Policy Act of 2005. The Technology Transfer Policy Board is already working towards simplifying and streamlining technology transfer transactions at DOE facilities that involve further R&D. They are exploring the creation of a limited number of clearly defined partnering transaction vehicles (e.g., CRADAs) that would available for use, as appropriate, at any facility. This should eliminate a significant impediment to partnering by addressing a major partner complaint: confusion caused in dealing with all the different partnering mechanisms at the various DOE facilities.

The Secretary recently issued a issued Policy Statement on Technology Transfer at DOE Facilities designed to help guide and strengthen the Department's technology transfer efforts and to heighten awareness of the importance of technology transfer activities throughout DOE. This Policy Statement builds upon the stimulus provided by the technology transfer provisions contained in the Energy Policy Act of 2005 and other recent legislative actions such as the "America COMPETES Act" that seek to improve the transfer of energy technologies from the Department's Facilities to products and applications that address public and private needs.

My office is also examining the more than $500M/year spent to provide matching funds with private partners to promote promising energy technologies for commercial purposes. This, combined with reviews of all technology activities across the Department for the purpose of better coordination between the basic and applied programs, will help us meet most of ARPA-E's goals.

The creation of the Energy Frontier Research Centers (EFRC) is the latest manifestation of the Office of Science's commitment to provide innovative basic research to accelerate scientific breakthroughs needed to create advanced energy technologies for the 21st century. The EFRCs will be based on competitive awards of from $2M-5M per year for an initial 5-year period.

We seek to engage the Nation's intellectual and creative talent to tackle the scientific grand challenges associated with determining how nature works, leading the scientific community to direct and control matter at the quantum, atomic, and molecular levels, and harness this new knowledge and capability for some of our most critical real-world challenges. The EFRCs will pursue fundamental basic research in areas such as Solar Energy Utilization; Geosciences for Nuclear Waste and CO2 Storage; Catalysis for Energy; Advanced Nuclear Energy Systems; Electrical Energy Storage; Combustion of 21st Century Transportation Fuels; Solid State Lighting; Hydrogen Production, Storage, and Use; Superconductivity; and, Materials Under Extreme Environments

U.S. universities, DOE laboratories, and other institutions are eligible.

The EFRCs and the Bioenergy Research Centers that preceded them are examples of the Office of Science using the authorities granted to us to create non-traditional, nimble, well-thought out and well-funded basic research institutions. I believe that these and other changes mentioned above that the Secretary and I are implementing within the Department fully address the goals and the spirit of the COMPETES Act as well as the Energy Policy Act of 2005. It would be inappropriate to create a new overlapping bureaucracy that would duplicate existing activities, in an attempt to further integrate or accelerate these activities.

TUESDAY, MARCH 11, 2008.

# U.S. DEPARTMENT OF ENERGY—ENERGY SUPPLY AND CONSERVATION, FOSSIL ENERGY, ELECTRICITY DELIVERY AND ENERGY RELIABILITY

## WITNESSES

**ALEXANDER KARSNER, ASSISTANT SECRETARY FOR ENERGY EFFICIENCY AND RENEWABLE ENERGY**

**JAMES SLUTZ, ACTING PRINCIPAL DEPUTY ASSISTANT SECRETARY, OFFICE OF FOSSIL ENERGY**

**KEVIN KOLEVAR, ASSISTANT SECRETARY FOR ELECTRICITY DELIVERY AND ENERGY RELIABILITY**

**C.H. "BUD" ALBRIGHT, JR., UNDER SECRETARY OF ENERGY**

## CHAIRMAN VISCLOSKY'S OPENING STATEMENT

Mr. VISCLOSKY [presiding]. Good morning. The subcommittee will come to order. The Subcommittee on Energy and Water Development meets today to hear testimony on energy research and development programs at the Department of Energy.

The rising price of gasoline is hitting the wallet of every American. In January 2003, the average retail price for a gallon of gasoline in the United States was $1.50, roughly equal to the real, inflation-adjusted price during much of the preceding half-century. Since then, the price of gasoline has risen sharply. It was last below $2 per gallon in February, 2005, and for much of 2007 prices topped $3 per gallon. Over the past 2 years, this subcommittee has provided $2.4 billion to support research, development and deployment of renewable energy and energy efficiency programs.

Today, we have the Assistant Secretary for Energy Efficiency and Renewable Energy, Mr. Andy Karsner, to discuss his fiscal year 2009 budget request. I will ask you, Mr. Karsner, how this investment in your programs will ease the price of energy for all Americans since the expenditures of these monies does not seem to have had a positive effect to date.

Hardly a day goes by without a story on the future use of coal, concern over $CO_2$ emissions, and whether utilities will go ahead with future coal plants. Mr. James Slutz, the Acting Principal Deputy for Fossil Energy, is here to defend the fiscal year 2009 fossil energy budget request, and I do hope our discussion today, Mr. Slutz, is in nominal dollars.

Monitoring the electric grid capacity, surety and security are key to making electricity available to all of us. Assistant Secretary for Electricity Delivery and Energy Reliability, Mr. Kevin Kolevar, has the job where if you don't see him, it is a good thing, because it means grid operations are working. We look forward to hearing about the fiscal year 2009 budget request for these programs.

And finally, we are pleased to have the Under Secretary of Energy, Mr. Bud Albright, for his first appearance before this subcommittee. Mr. Albright, welcome. We would like to hear from you about the programs under your jurisdiction, along with specific administration initiatives such as the retooling of FutureGen and the reoccurring initiative to expand the Strategic Petroleum Reserve.

Gentlemen, welcome. Let me ask you to present a summary of your remarks. Your full written testimony will be entered into the record. I ask that you ensure that the hearing record, the questions for the record, and any supporting information requested by the subcommittee are cleared through the Department and the Office of Management and Budget, and delivered in final form to the subcommittee no later than 4 weeks from today, since we will potentially be under very tight time constraints as far as marking up our bill.

All members who have additional questions for the record, please have them submitted to the subcommittee offices by 5:00 p.m. today.

And now it is my pleasure to turn to my friend and colleague, Mr. Hobson, for any opening remarks he has.

MR. HOBSON'S OPENING STATEMENT

Mr. HOBSON. Good morning, and thank you, Mr. Chairman.

Well, gentlemen, welcome to an unfortunate series of Energy Department hearings. I do hope we won't hear another recounting this morning of how the Department is ignoring congressional direction in order to meet its own internal priorities. Some of you have been here before. Bud, it is good to see you again in this setting. This is my last hearing, and I guess some of your last hearings also—your first and last, I guess, Bud. I don't know what that says. [Laughter.]

Congress provided a significant increase for each of your programs over the President's fiscal year 2008 request. Mr. Kolevar, your budget received nearly $14 million more than requested. Fossil energy received a $176 million increase from the request, and energy efficiency and renewable energy was the biggest winner, with an overall $486 million added to the request.

I might have a question later about whether this is the right balance or not. Maybe more money should go to fossil energy since whether we are thinking about cutting carbon emissions or reducing reliance on foreign oil, we have to improve our coal plants.

Of course, I think nuclear is going to be an increasingly important part of our generation, but I will talk about that at the nuclear energy hearing. I have serious questions about what this department has or has not done do to advance nuclear energy. Anyway, I hope we can talk more about the correct balance later.

I am going to mention one other thing, and maybe this isn't the right place to do it, but I am going to do it anyway. The other day I was in a hearing, a defense hearing. We were talking about the biggest problem in Afghanistan, and it is energy and the transmission lines. I said to the guy that when I was chairman, 3M came to us with a program that would help. If they could get some development of their product, they could increase the capacity of

the power lines without restringing them. I said, why didn't you go to DOE? And he said, well, they won't talk to us.

So we did an earmark for about 3 years. Then I read an epistle from the Department of Energy saying how wonderful this new program was and that 3M had this product. I thought, how ironic. DOE wouldn't even talk to them in the beginning until we did one of those dreaded earmarks that the administration talks about so much. Now, there is a product out there and it may be of some use. So, we are going to try and go back and see if we can use it in Afghanistan to help with their energy problems.

Once again, welcome to the subcommittee. I hope that the next few hours proceed smoothly and that each of you can give us good news about how you are implementing our direction, along with your own. I look forward to hearing your testimony, and then we will get into questions.

Thank you for being here.

Thank you, Mr. Chairman.

Mr. VISCLOSKY. Secretary Albright.

MR. ALBRIGHT'S OPENING STATEMENT

Mr. ALBRIGHT. Thank you, Mr. Chairman and members of the committee. I am pleased to be here today to present the president's fiscal year 2009 budget proposal for the Department of Energy. In keeping with your invitation, this testimony will focus on budget requests for the Office of Energy Efficiency and Renewable Energy, the Office of Electricity, and the Office of Fossil Energy. The assistant secretary for each of the organizations is with us, as you know, and can give a more detailed statement concerning their budget request.

First, though, let me put some context to the department's overall budget request. In fiscal year 2009, the department will implement the Advanced Energy Initiative to accelerate the research and development of clean energy technologies and diversify our nation's energy supply. These efforts will foster continued economic growth and promote a sustainable energy future.

Our goal can be met by, one, accelerating the development of clean and renewable energy technologies that will dramatically increase the amount of reduced-emission energy produced in the United States; two, advancing energy-efficient technologies and practices that use less energy; and three, providing information from research, development and demonstration activities that can help stimulate private sector choices that will drive change in our energy system.

Our energy portfolio benefits from the abundance of coal as a domestic energy source, and we remain committed to research and development to further advance coal's clean and efficient use. The budget provides $407 million to research and $241 million to demonstrate advanced coal technologies. This money is almost entirely dedicated to cost-effective carbon capture and sequestration for coal-fired electricity plants.

The department also continues to work with the Department of Treasury to administer a $1.65 billion in investment tax credits from the Energy Policy Act of 2005. That will accelerate the com-

mercial deployment of technologies central to carbon capture and storage.

The Office of Energy Efficiency and Renewable Energy is requesting $1.255 billion for 2009, approximately $19 million higher than in 2008. This is to manage America's investment in the research, development and deployment of DOE's diverse energy efficiency and renewable energy applied science portfolio. These funds support a necessary, diverse and critical path of energy efficiency and renewable energy research that, partnered with public and private actions, can help the United States meet the energy challenges of the 21st century.

As our nation's energy capacity grows, we are faced with the challenge of ensuring more reliable electricity delivery. Because electricity is vital to nearly every aspect of life—from powering our electronics and heating our homes, to supporting commerce, transportation, finance, food and water systems, and also ensuring national security—any disruption of electricity can have a major consequence to the economy and to public health and safety.

With an investment of $134 million in 2009, the department, through the Office of Electricity Delivery and Energy Reliability, will provide leadership in developing the next generation of electric delivery infrastructure systems that will enable reduced-emission energy choices, spur development of automated grid operations, and encourage strong market economics.

In 2009, the Department of Energy continues to strengthen the framework built over the last 8 years to ensure our national energy security and reliability. Energy helps drive the global economy and has a significant impact on our quality of life and the health of our people and our environment. We must continue to develop and to use energy if we are to support and sustain a strong economy. We must also continue to find more efficient and diverse ways to power our world.

I appreciate this opportunity to testify. This completes my opening statement, and I am happy at the appropriate time to answer any questions you have.

[Statement of C.H. "Bud" Albright:]

**Statement of C.H. "Bud" Albright, Jr.**
**Under Secretary of Energy**
**Before the**
**Subcommittee on Energy and Water Development, and Related Agencies**
**Committee on Appropriations**
**U.S. House of Representatives**
**March 11, 2008**

Mr. Chairman and members of the Committee, I am pleased to be before you today to present the President's fiscal year (FY) 2009 budget proposal for the Department of Energy. In keeping with your invitation, this testimony will focus on the budget requests for the Office of Energy Efficiency and Renewable Energy, the Office of Electricity, and the Office of Fossil Energy. The Assistant Secretary for each of the organization is also with us and will give a more detailed statement concerning their budget request. But let me first provide some context for the Department's FY 2009 budget request and then highlight key areas of interest for these three energy programs.

The Department of Energy's FY 2009 budget request stays on course to address the growing demand for affordable, clean and reliable energy; preserve our national security; and enable scientific breakthroughs that could have significant impacts on our quality of life and the health of the American people.

In FY 2009, the Department will advance the President's American Competitiveness Initiative aimed at ensuring U.S. technological competitiveness and economic security, and implement the Advanced Energy Initiative, to accelerate the research and development of clean energy technologies to diversify our nation's energy supply. These efforts, combined with investments to meet our commitment to protect the United States as stewards of our nation's nuclear weapons stockpile and to environmental cleanup, will foster continued economic growth and promote a sustainable energy future.

This budget, while focused on delivering results to meet the nation's priorities, also serves as the roadmap for the future of America's energy security. The FY 2009 budget request translates into investments that will:

- Expand research, development, and demonstration of cost-effective carbon capture and storage,
- Accelerate technological breakthroughs outlined in the Advanced Energy Initiative,
- Provide enhanced energy security through the expansion of the Strategic Petroleum Reserve,
- Continues to foster scientific leadership with the American Competitiveness Initiative,
- Advance environmental cleanup and nuclear waste management,
- Maintain the safety and reliability of the nuclear weapons stockpile and continue transforming the weapons complex, and

- Work with other countries to prevent the spread of weapons of mass destruction.

To highlight, in FY 2009 the Department of Energy continues to meet this vision and strengthen the framework built over the last eight years to ensure our national energy security and reliability. The FY 2009 budget request:

- **Invests in Climate Change Technologies**
  In support of the Administration's initiatives that support climate change technology and to implement the U.S. Climate Change Technology Program's Strategic Plan, the FY 2009 budget emphasizes a two-pronged strategy for its climate change technology programs: invest in carbon dioxide ($CO_2$) mitigation technologies for coal with carbon capture and storage (CCS) and in nuclear power, and invest in near-term, $CO_2$ mitigation technologies focused on improving energy efficiency. The budget provides $407 million to research and $241 million to demonstrate advanced coal technologies which is almost entirely focused on cost-effective CCS for coal-fired power plants. The Department also continues to help work with the Department of the Treasury to administer $1.65 billion in investment tax credits from the Energy Policy Act of 2005 that will accelerate commercial deployment of technologies that are central to carbon capture and storage.

  Through international collaboration, the United States strives to maintain a leadership role in promoting and deploying clean energy technology domestically and around the world. President Bush believes that the greatest progress will be assured by working together with other nations to advance the related objectives of improving economic and energy security, alleviating poverty, improving human health, reducing harmful air pollution, and reducing the growth of greenhouse gases. The United States, Australia, China, India, Japan, Canada, and South Korea work to implement the objectives of the **Asia-Pacific Partnership** (APP) on Clean Development and Climate. This Partnership is helping to advance the President's goal of developing and accelerating the deployment of cleaner and more efficient technologies and practices. It builds on existing multilateral climate initiatives including the Carbon Sequestration Leadership Forum, the International Partnership for a Hydrogen Economy, and Methane to Markets. In FY 2009, the Department is requesting $15.0 million, evenly divided between the Fossil Energy Program and the Energy Efficiency and Renewable Energy Program, to continue to support this important initiative.

- **Advances the American Competitiveness Initiative**
  In 2007, President Bush launched the American Competitiveness Initiative (ACI) to encourage innovation throughout the economy and to give America's children a firm foundation in math and science. A request of $4.7 billion in FY 2009, $748.8 million above the FY 2008 enacted level, will increase basic research in the physical sciences that will have broad impacts on future energy technologies and environmental solutions. ACI funding will support the construction and operation of world-class scientific facilities and will support literally thousands of

scientists and students -- our current and future scientific and technical workforce. Scientific and technological discovery and innovation are the major engines of increasing productivity -- indispensable to ensuring growth, job creation, and rising incomes for American families in the technologically driven twenty-first century. This investment is essential if the United States is to maintain its world-class, scientific leadership and global competitiveness.

- **Accelerates the Advanced Energy Initiative**
  At a request of $3.2 billion, $623 million above the FY 2008 enacted appropriations of $2.5 billion, the President's Advanced Energy Initiative (AEI) will continue to support clean energy technology breakthroughs that will help improve our energy security through diversification and help to reduce our dependence on oil. The FY 2009 budget for AEI includes funding to promote the licensing of new nuclear power plants and research on an advanced nuclear fuel cycle. Also, AEI's diverse energy portfolio includes investment in making solar power cost-competitive with conventional sources of electricity by 2015 and supports a robust vehicle technology program that includes developing lithium-ion batteries, plug-in hybrids, and drive-train electrification.

- **Expands the Resurgence of Nuclear Energy**
  Nuclear energy is an important source of energy in the United States and is a key component of the AEI portfolio. Nuclear energy is free of greenhouse gas (GHG) emissions, safe, reliable, and currently supplies about 20 percent of the nation's electricity. The Department is leading the Administration's efforts to spur a nuclear renaissance in the United States to meet energy and climate goals. We continue to work with industry partners to promote the near term licensing and deployment of the first new nuclear plants in over 30 years, as well as to extend the life of current plants. Furthermore, the Department is developing advanced nuclear fuel technologies that will maximize energy from nuclear fuel. These technologies will strengthen the nuclear nonproliferation regime and further support the expansion of nuclear power as a safe, efficient, and cost-effective source of energy capable of supporting continued economic growth in the 21st century. In FY 2009, a total of $1.4 billion is requested for nuclear energy activities including $487 million for the Mixed Oxide Fuel Fabrication Facility.

  It is critical to note that the growth of nuclear power is only possible if we continue to develop a responsible path for disposing of spent nuclear fuel. Therefore, $494.7 million is requested in FY 2009 for the continued development of the geologic waste repository at **Yucca Mountain**, Nevada, and to support the defense of the License Application that we will submit in 2008 to the Nuclear Regulatory Commission for authorization to construct the repository.

- **Transforms Our Nuclear Weapons Complex**
  The FY 2009 budget reconfirms the Department of Energy's steadfast commitment to the national security interests of the United States through stewardship of a reliable and responsive nuclear weapons stockpile and by

advancing the goals of global non-proliferation. Through the National Nuclear Security Administration (NNSA), the Department directs $6.6 billion in this request for **Weapons Activities**, a $320.6 million increase from the FY 2008 enacted appropriation, to meet the existing requirements for stewardship of the nation's nuclear weapon stockpile, technologies and facilities, as well as to continue to transform the nuclear weapons complex with the goal of a much smaller size by 2030. This transformation effort is structured to achieve President Bush's vision to create a more efficient and less expensive nuclear weapons complex of the future that is able to respond to changing national and global security challenges.

- **Reduces the Risk of Weapons of Mass Destruction (WMD) Worldwide**
  The Department has provided $1.8 billion in this request for detecting, securing, eliminating and disposing of dangerous nuclear materials around the world. The amount includes $1.2 billion within Defense Nuclear Nonproliferation, $487 million within the Office of Nuclear Energy, and $117 million funded in Weapons Activities. The Mixed Oxide (MOX) Fuel Fabrication Facility project remains a key activity of the nation's nuclear nonproliferation efforts. The FY 2009 request for MOX is $ 208.2 million more than the FY 2008 enacted appropriation reflecting continued support for this project. Further, the request provides significant out-year growth to fulfill our international agreements and accelerate our work to reduce the risk of (WMD) threats. Among many advances, the FY 2009 budget provides for the installation of radiation detection equipment at an additional 49 foreign sites in 14 countries and at 9 additional Megaports; continues to implement an aggressive, prioritized work schedule to complete all shipments of Russian origin spent highly-enriched uranium (HEU) fuel stored outside reactor cores by the end of 2010; and maintains a schedule allowing completion of the construction of the second of two fossil-fueled power plants located in Zheleznogorsk, Russia, in 2010. The Seversk project is scheduled for completion by the end of December 2008.

- **Meets Our Commitments to Public Health and Safety and the Environment**
  During Secretary Bodman's first days at the Department of Energy, he announced safety as his top priority and the number one operating principle of the Department. To implement his vision, he created a new **Office of Health, Safety and Security**. Ensuring the safety of workers across the DOE complex is the Department's top priority and this new office will go a long way in strengthening our safety and security organization. We must be world class not only in how we carry out our mission, but in the safe, secure, and environmentally responsible way in which we manage operations at our facilities across the country. The organization's FY 2009 budget request of $446.9 million, builds on a number of actions the Department has taken over the past two years to increase safety of DOE workers.

  The FY 2009 budget includes $5.5 billion for the **Environmental Management** program to protect public health and safety by cleaning up hazardous, radioactive

legacy waste left over from the Manhattan Project and the Cold War. This budget allows the program to continue to make progress towards cleaning up and closing sites and focuses on activities with the greatest risk reduction. By the end of 2009, cleanup projects at Sandia National Laboratory and Argonne National Laboratory will be finished.

As the Department continues to make progress in completing clean-up, the FY 2009 budget request of $186 million for **Legacy Management** supports the Department's long-term stewardship responsibilities and payment of pensions and benefits for our former contractor workers after site closure.

In light of the increased number of sophisticated cyber attacks directed at all facets of our communities, from military to civilian to private users, the Department is taking significant steps to secure the virtual pathways and mitigate the threat from cyber intrusions. Implementing these steps will be seamless and will not interrupt the availability of information systems resources while preserving the confidentiality and integrity of the information and their contents. A budget request of $157 million in FY 2009 supports the Department's efforts to defend against emerging, complex cyber attacks. Through these efforts, the Department will be in a better position to effectively manage and monitor cyber risk across the complex. In FY 2009, DOE will increase support on a Department-wide basis to deploy new cyber security tools and cyber security management activities to detect, analyze, and reduce the threat across the complex.

**PROMOTING AMERICA'S ENERGY SECURITY THROUGH RELIABLE, CLEAN, AND AFFORDABLE ENERGY**

The FY 2009 request will deliver a balanced and diverse portfolio of solutions to strategically address the urgent energy and environmental challenges facing our country today. Our goal can be met by: 1) accelerating the development of clean and renewable energy technologies to dramatically increase the amount of clean energy produced in the United States; 2) advancing energy efficient technologies and practices that use less energy; and 3) providing information from research, development, and demonstration activities, which could help stimulate private sector choices that will drive change in our energy systems. DOE's applied energy programs are taking pro-active steps to catalyze the advancement of these important technologies through research and development, innovative partnerships, international cooperation through the **Asia Pacific Partnership**, and collaboration with states, industry leaders, and other stakeholders.

The budget lays the groundwork for implementing key elements of the Energy Independence and Security Act of 2007 (EISA). It contains elements that are unprecedented in size, scope and timeframe for increasing our energy security, diversifying our energy system and making America's energy systems stronger, safer and cleaner for future generations. We can further advance the U.S. commitments made at the U.N. Climate Change Meeting in Bali and the Major Economies Meetings to employ clean energy technologies in the global effort to reduce greenhouse gas emissions.

Consistent with the President's initiatives and the EISA, the FY 2009 budget contributes to key elements of the American Competitiveness and Advanced Energy Initiative that could help reduce our dependence on oil, lessen dependence on foreign sources of energy, and change the way we power our homes, businesses, and automobiles.

The proposed Office of Energy Efficiency and Renewable Energy (EERE) budget of $1.255 billion provides a diverse portfolio of solutions to our challenges, including:

**Fuels and Vehicle Solutions (Biomass, Vehicles, and Hydrogen programs: $592.3 million)**

- Advancing essential R&D projects to achieve cost competitive, commercial scale cellulosic ethanol production by 2012;
- Conducting R&D on lithium-ion batteries, plug-in hybrids, and drive-train electrification to diversify and make our nation's vehicles more efficient to reduce petroleum dependency;
- Continuing to research and develop critical hydrogen technologies that enable a commercialization decision in 2015; and
- Supports fuel testing and validating codes and standards that will help accelerate new fuel and vehicle solutions to the market.

**Renewable Power Solutions (Wind, Solar, Geothermal, and Water Power programs: $241.6 million)**

- Integrating renewable energy technologies with energy storage technologies to resolve the intermittency challenge;
- Supporting wind power R&D to enable wind turbines to produce an increasing amount of the nation's electricity;
- Investing in solar power to make photovoltaics widely available nationwide and commercially cost-competitive with conventional electricity by 2015;
- Accelerating a refocused geothermal program that conducts enhanced geothermal systems R&D; and
- Pursuing water power technologies as part of EERE's R&D portfolio.

**Efficiency Solutions (Buildings and Industrial Technologies programs: $185.9 million)**

- Reducing energy consumption and transforming the carbon footprint of the built environment through the development of zero energy buildings; and
- Supporting the advancement of clean and efficient industrial technologies and processes that will drive a 25 percent increase in U.S. industrial energy productivity by 2017.

Our energy portfolio also recognizes the abundance of coal as a domestic energy resource and remains committed to research and development to promote its clean and efficient use. Because coal in the U.S. accounts for 25 percent of the world's coal reserves, the FY 2009 request focuses on carbon capture and storage.

- Integration of advanced **Integrated Gasification Combined Cycle** (IGCC) coal technology with **Carbon Capture and Storage** remains the foundation of the

Department's clean coal research program to establish the capability of producing electricity from coal with near-zero atmospheric emissions. The Administration remains strongly committed to **FutureGen** and is requesting $156 million in FY 2009. An additional $407 million is requested within the **Coal** program to support research and development on technologies that support the concept.

- The Coal program continues to fund large-scale demonstrations through the **Clean Coal Power Initiative** (CCPI) with $85 million requested in FY 2009 to support a Round 3 solicitation which will focus on demonstrating carbon capture and storage technologies.
- As part of the greenhouse gas mitigation strategy, the Department continues the **Carbon Sequestration** program through its large-scale field testing, and will inject carbon dioxide into several types of geological formations. Within the $407 million requested for coal research and development activities, the Department is requesting $149 million for continued work in this area.

Consistent with the FY 2006, 2007, and 2008 budget requests, the FY 2009 budget request continues to shift resources away from oil and gas research and development programs, which have sufficient market incentives for private industry support, to other energy priorities. Federal staff, paid from the program direction account, will work toward an orderly termination of the program in FY 2009.

To further assure against oil supply disruptions that could harm our economy, this budget also proposes $171.4 million for expanding the Strategic Petroleum Reserve (SPR) to an ultimate capacity of 1.5 billion barrels by 2029. In FY 2008, DOE will use available balances for the purchase of additional SPR oil and will continue to fill using federal royalty oil until 727 million barrels is achieved in FY 2009. Capacity expansion from 727 million barrels to 1.0 billion barrels will begin in FY 2008 with land acquisition activities. The request also funds National Environmental Policy Act (NEPA) activities associated with the further expansion of SPR capacity to 1.5 billion barrels.

The Energy Policy Act of 2005 established a mandatory oil and gas research and development (R&D) program, called the Ultra-Deepwater and Unconventional Natural Gas and Other Petroleum Research program, which is funded from federal revenues from oil and gas leases beginning in FY 2007. These R&D activities are more appropriate for the private-sector oil and gas industry to perform. Therefore, the FY 2009 budget proposes to repeal the program through a separate legislative proposal.

As our nation's energy capacity grows we are faced with the challenge of ensuring a more reliable electricity delivery. Major hurricanes, reliability events and increased congestion in major transmission corridors are costing taxpayers billions of dollars each year and jeopardize the safety and well-being of millions of Americans and U.S. industry. The electric grid is becoming increasingly vulnerable to cyber attacks against control systems. Since electricity is vital to nearly every aspect of life, from powering our electronics and heating our homes to supporting commerce, transportation, finance, food

and water systems, and ensuring national security, any disruption can have major consequences to the economy and public health and safety. With an investment of $134 million in FY 2009, the Department through the **Office of Electricity Delivery and Energy Reliability** will provide the leadership in developing the next generation electric delivery infrastructure that enables clean energy choices, automated grid operations, and flourishing markets.

## CONCLUSION

Energy is central to our economic and national security. Indeed, energy helps drive the global economy and has a significant impact on our quality of life and the health of our people and our environment. I appreciate the opportunity to appear before you. This completes my testimony, and I would be pleased to respond to your questions today or in the future.

Mr. VISCLOSKY. Thank you very much.
Mr. Karsner.

MR. KARSNER'S OPENING STATEMENT

Mr. KARSNER. Good morning, Chairman Visclosky, Ranking Member Hobson, members of the committee. Thank you for the opportunity to testify on the president's fiscal year 2009 budget request for the Office of Energy Efficiency and Renewable Energy.

EERE's fiscal year 2009 request of $1.255 billion, approximately $19 million higher than the fiscal year 2008 request, provides a balanced and diverse portfolio of solutions to address the energy and environmental challenges facing us today. The request will enable EERE to research, develop and deploy renewable energy technologies to dramatically increase the amount of clean energy produced in the United States; advance energy efficiency technologies and practices to sustainably decouple energy demand from economic growth; and strengthen commercialization and deployment to support rapid adoption by private industry of clean energy technologies.

The need for clean energy solutions is abundantly clear, with the nation's energy challenges plainly identified. Our efforts today and onward need to be about the implementation and scaling of solutions—well-identified solutions, multi-path solutions, parallel path solutions—trying what we must on a scale and a pace that is commensurate with the magnitude and urgency of the problem.

On December 19, 2007, the president signed the Energy Independence and Security Act of 2007, EISA, into law. The new mandates included in EISA are unprecedented in size, scope and timeframe. Together, we are taking great strides to move beyond problem identification and towards problem solving that will enhance our energy security, diversify our energy systems and reduce emissions that affect global climate change.

EERE's overall budget request reflects the funding needed to meet our energy challenges head-on. Advanced fuels in vehicles, renewable power, efficiency in buildings and industry, and technology deployment comprise EERE's portfolio and multi-pronged approach to energy solutions. My written testimony, which I will submit for the record, includes a description of the priorities and specific funding requests in the EERE program areas.

The achievement of EERE program goals could save consumers over $600 billion by the year 2030, and as much as $4 trillion by 2050 cumulatively. Similarly, we expect that the portfolio will avoid six gigatons of carbon by 2030 and nearly 50 gigatons of carbon by 2050 cumulatively. With action plans, performance milestones, clearly articulated deliverables, and continued performance, EERE's budget request will strengthen our dynamic partnerships with private industry and academia that have grown our nation's economic well being. Our laboratory products and partnerships resulting in industry commercialization are at unprecedented levels and will bring clean energy technologies and sources to large-scale commercial viability in the very near future.

This concludes my prepared statement, and I am happy, of course, to answer any questions the committee members may have.

[Statement of Alexander Karsner:]

**STATEMENT OF**

**ALEXANDER KARSNER**

**ASSISTANT SECRETARY FOR ENERGY EFFICIENCY**

**AND RENEWABLE ENERGY**

**U.S. DEPARTMENT OF ENERGY**

**BEFORE THE**

**COMMITTEE ON APPROPRIATIONS**

**SUBCOMMITTEE ON ENERGY AND WATER DEVELOPMENT**

**UNITED STATES HOUSE OF REPRESENTATIVES**

**MARCH 11, 2007**

Mr. Chairman and Members of the Committee, thank you for this opportunity to testify on the President's Fiscal Year (FY) 2009 budget request for the Office of Energy Efficiency and Renewable Energy (EERE).

EERE's FY 2009 request of $1.255 billion, approximately $19 million higher than the FY 2008 request, provides a balanced and diverse portfolio of solutions to address the energy and environmental challenges facing us today. The request will enable EERE to research and develop renewable energy technologies that can help increase the amount of clean energy produced in the U.S.; advance energy efficiency technologies and practices; and promote adoption by private industry of clean energy technologies.

The need for clean energy solutions is clear. With the nation's energy challenges plainly identified, our efforts today and onward need to be about the development of solutions -- balanced, diverse, well-identified solutions, multipath solutions, as well as parallel path solutions.

On December 19, 2007, the President signed the Energy Independence and Security Act of 2007 (EISA) into law. Together, we have taken great strides to move beyond problem identification and toward problem solving that will enhance our energy security, diversify our energy systems, and reduce emissions that contribute to climate change.

EERE's overall budget request reflects the funding needed to meet our energy challenges head on. Advanced fuels and vehicles, renewable power, efficiency in buildings and industry, and technology deployment comprise EERE's portfolio and multipronged approach to energy solutions. I will now provide a description of the priorities and specific funding requests of EERE's program areas.

## BIOMASS AND BIOREFINERY SYSTEMS R&D

In FY 2009, the Department is requesting $225 million for the Biomass Program, an increase of $26.8 million from the FY 2008 appropriation. The Biomass Program's funding supports the *Biofuels Initiative* that was launched in 2006 as part of the *Advanced Energy Initiative* (AEI) and is designed to achieve cost competitive cellulosic ethanol by 2012. The funding also supports the President's *"Twenty-in-Ten"* initiative, announced in the 2007 State of the Union, to reduce gasoline consumption by 20 percent by 2017.

EISA includes increased Corporate Average Fuel Economy (CAFE) standards and an increased Renewable Fuel Standard (RFS). The Act increases CAFE standards to 35 miles per gallon for all passenger automobiles, including light trucks, by 2020; and mandates the replacement of 36 billion gallons of gasoline with renewable fuel by 2022, including 16 billion gallons of cellulosic ethanol. The Biomass Program's funding request for technology development and demonstration is expected to support timely achievement of EISA requirements. The Program is focused on: Feedstock Infrastructure to reduce the cost of feedstock logistics; Platforms R&D for efficiently converting feedstocks into cost competitive commodity liquid biofuels; and Utilization of Platform Outputs to demonstrate and validate integrated technologies that achieve commercially acceptable performance and cost targets through public-private partnerships. The

Program strategy is to accelerate development of the next generation of feedstocks and conversion technology options for validation and demonstration in integrated biorefineries at commercial and 10 percent of commercial scale. This strategy balances the program's research, development, and deployment (RD&D) portfolio by encouraging technology transfer while maintaining core R&D funding for next generation technologies. The Program will continue to emphasize cellulosic ethanol and expand the focus on other renewable biofuels, such as biobutanol and green diesel.

VEHICLE TECHNOLOGIES PROGRAM

The FY 2009 Vehicle Technologies Program's request is $221.1 million, an $8 million increase over the FY 2008 appropriation.

Vehicle Technologies Program activities focus on advanced, high-efficiency vehicle technologies, including combustion engines and enabling fuels, hybrid vehicle systems (including plug-in hybrids), high-power and high-energy batteries, advanced lightweight materials, and power electronics. These technologies are critical to near-term oil savings when used in advanced combustion hybrid and plug-in hybrid electric vehicles (PHEVs). In FY 2009, emphasis will increase R&D for PHEVs, such as high energy storage batteries.

The Program continues to place increasing emphasis on accelerating RD&D on lithium-ion batteries, plug-in hybrids (including plug-in hybrid vehicle demonstrations), and drive-train electrification to diversify and make our nation's vehicles more efficient to reduce petroleum dependency. The R&D centers on improving advanced combustion engine systems and fuels and on reducing vehicle parasitic losses. The Vehicle Technologies budget is modified in the FY 2009 request by transferring three activities from the Hydrogen Technology Program: Education; Technology Validation; and Safety and Codes and Standards. These activity areas have congruent objectives with other efforts within the Vehicle Technologies Program, and combining them within one program enables management efficiencies.

The Program will continue FY 2008 efforts to evaluate the impact of intermediate ethanol blended gasoline (i.e., greater than E10) in conventional (i.e., non-FFV) vehicles and to improve the efficiency of engines operating on ethanol blends. Late model and legacy vehicles will be tested for emissions, performance, and materials impacts. Intermediate blends could provide a way to increase ethanol use sooner. These efforts support existing requirements and the President's 20 in 10 plan.

HYDROGEN TECHNOLOGY PROGRAM

The Hydrogen Technology Program's FY 2009 budget request is $146.2 million, $64.8 million less than the FY 2008 appropriation, due in part to the movement of the three activities mentioned above to the Vehicle Technologies Program. In 2009, the program will focus on remaining critical path barriers to the technology readiness goals for 2015. Substantial increases are included for hydrogen storage and fuel cell R&D. To provide for those increases, all funding for hydrogen production from renewables was eliminated and systems analyses continues at a somewhat reduced funding level.

The Hydrogen Program continues to research and develop critical hydrogen technologies that enable near-term commercialization pathways. Hydrogen Storage is one of the most technically challenging barriers to the widespread advancement of hydrogen and fuel cell technologies in the transportation sector. Our portfolio continues to identify new materials for on-board storage having the potential for greater than 50% improvement in capacity than those available prior to 2004. Much needs to be done to enable these materials to operate at practical temperatures and pressures.

In 2009, the Hydrogen Program will significantly increase investment in applied R&D of novel materials and breakthrough concepts with potential to meet on-board storage system performance targets. R&D funding will be competitively awarded and conducted through both Centers of Excellence and independent projects. The overarching goal is lightweight, low-cost, low-pressure, and efficient on-board vehicular storage systems to achieve a driving range of greater than 300 miles, without impacting vehicular cargo or passenger space to be competitive with today's vehicles.

To address the critical barriers of fuel cell cost and durability, the FY 2009 request significantly increases funding for Fuel Stack Components R&D. Our R&D efforts have made significant progress in this area and will continue efforts to achieve our stated goals, reducing the high-volume cost of automotive fuel cells from $275 per kilowatt in 2002 to $94 per kilowatt in 2007. In 2009, we hope to reduce the modeled cost of hydrogen fuel cell power systems to $60 per kilowatt. One notable recent achievement was the cost-shared development of a membrane with 5,000 hours lifetime, a giant leap toward the 2010 goal of 5,000 hours durability in an automotive fuel cell system.

The Hydrogen Program's fuel cell R&D will continue to pursue a number of technological advancements. Proton-conducting membranes that are low-cost, durable, and operable at a low relative humidity will be developed. Non-precious metal and alloy catalysts will be identified and developed to further lower the cost of fuel cell systems. Gas flow through the flow fields will be modeled and measured while fuel cells are in operation to ensure optimal gas and water distribution over the catalyst and membrane surface. And fuel cells for distributed energy generation will continue to be developed with an emphasis on system integration, cost reduction and efficiency improvements. The Department will also continue its participation in the International Partnership for Hydrogen Economy (IPHE) – collaborating on R&D of materials for both fuel cells and storage, and working on such projects as the evaluation of fuel cell-related test protocols from different countries, as well as hydrogen pathway and infrastructure analyses.

## SOLAR ENERGY PROGRAM

The FY 2009 budget request for the Solar Energy Program is $156.1 million, $12.3 million less than the FY 2008 appropriation. Through the President's *Solar America Initiative* (SAI), announced in the 2006 State of the Union, the Solar Program will accelerate market competitiveness of solar photovoltaic technologies through R&D aimed at less expensive, more efficient, and highly reliable solar systems. Targeting improved performance and reliability

with reduced cost, the Solar Program focuses its RD&D activities in two technology areas: photovoltaics (PV) and concentrating solar power (CSP).

The Solar Program's goal in the area of photovoltaics is to develop and deploy highly reliable PV systems that are cost-competitive with electricity from conventional resources. The Program focuses on improving the performance of cells, modules, and systems; reducing the manufacturing cost of cells, modules, plant components, and systems; reducing the installation, interconnection, and certification costs for residential, commercial, and utility systems; and increasing system operating lifetime and reliability. To lower costs more rapidly and improve performance, the Solar Program is focusing on PV technology pathways that have the greatest potential to reach cost competitiveness by 2015. Industry-led partnerships, known as "Technology Pathway Partnerships," will be continued in FY 2009 to help address the issues of cost, performance, and reliability associated with each pathway.

The Program's CSP focus is to develop concentrating solar technologies. A solicitation issued in FY 2007 resulted in 12 industry contract awards focused on establishing a U.S. manufacturing capability of low cost trough components and the technical feasibility of low cost thermal storage. In FY 2008, funds will be provided for Phase I of these contracts with the more promising contracts moving into Phase II in FY 2009. One of the most important advantages of CSP is its ability to thermally store power for later use. The development of advanced thermal energy storage technologies in FY 2009 will be expanded to include single heat transfer fluid systems that eliminate the need for multiple heat exchangers and thereby increase system efficiency and reduce cost. For distributed applications, research in FY 2009 will continue on improving the reliability of dish systems through the operation and testing of multiple units as well as improving the manufacturability of dish systems.

WIND ENERGY PROGRAM

The Wind Energy Program's FY 2009 request is $52.5 million, an increase of $3.0 million from the FY 2008 appropriation. The Wind Energy Program supports the AEI objective to maximize wind energy resource utilization in the United States by leading the nation's R&D efforts to improve wind energy generation technology and address barriers to the use of wind energy in coordination with stakeholders.

In 2007, the U.S. installed more wind generation capacity than any other country by bringing on-line 5 GW of new wind installations. Wind is now a major source of new electricity generation, and accounts for roughly 30 percent of new capacity from all energy sources. Since 2000, wind energy has increased more than 6-fold, from about 2.5 GW to nearly 16.8 GW today. While there are significant challenges, wind resources have the potential to provide up to 20% of our nation's generation potential.

The Wind Program believes that wind energy is at a transitional point, particularly for large land-based wind systems. The program is concentrating on reducing technological barriers that limit the growth potential of wind energy in the U.S. by focusing on improving cost, performance, and reliability of large scale land-based technology. As a part of the effort, NREL will be testing its

first utility-scale multi-megawatt turbine at the National Wind Technology Center in Colorado, through a competitive CRADA solicitation.

In addition, the Wind Program is facilitating wind energy's rapid market expansion by anticipating and addressing potential regulatory, transmission and manufacturing barriers; and investigating wind energy's application to other areas, including distributed and community owned wind projects.

The Program's focus also includes energy storage efforts in coordination with the Office of Electricity Delivery and Energy Reliability to maximize wind energy resource utilization, which supports diversifying the domestic energy supply while enhancing system reliability.

WATER POWER PROGRAM

The Water Power Program's budget request of $3.0 million will support initial R&D activities, and follows an initial congressional appropriation of $9.9 million in FY 2008. The program needs to evaluate the results of its FY 2008 R&D projects and technology assessments (which will continue into FY 2009) before considering further applied research efforts. The mission of the Water Power Program is to research and develop innovative and effective technologies capable of harnessing hydrokinetic energy resources, including ocean wave and current energy.

The program will focus on conducting technology characterizations to identify manufacturers, performance limits and issues, known environmental impacts, and other relevant technical and market variables. In addition the program will engage in collaborative international activities.

GEOTHERMAL TECHNOLOGY PROGRAM

The FY 2009 request for the Geothermal Technology Program is $30 million, which is an increase of $10.2 million from the FY 2008 appropriation. The Geothermal Technology Program works in partnership with industry to establish Enhanced Geothermal Systems (EGS) as an economically competitive contributor to the U.S. energy supply. Geothermal energy generates "base-load" electricity and/or supplies heat for direct applications, including aquaculture, crop drying, and district heating, or for use in heat pumps to heat and cool buildings.

The Program focuses on the innovative technology of Enhanced Geothermal Systems (EGS), which are engineered reservoirs created to produce energy from geothermal resources that would otherwise not be economical. EGS is a new pathway for producing geothermal energy by drilling wells into hot rock, fracturing the rock between the wells, and circulating a fluid through the fractured rock to extract the heat. While EGS reservoirs have been designed, built, and tested in various countries, a number of technical hurdles remain to be overcome, the most important involving creation of EGS reservoirs with commercial production rates and lifetimes. The Department's approach will concentrate initially on issues related to reservoir creation, operation, and management. This may involve working with cost-sharing partners at existing geothermal fields to develop, test, and perfect the tools needed to fracture hot, impermeable rock and efficiently circulate fluids.

A feasibility study by the Massachusetts Institute of Technology (MIT) estimates that EGS could provide 100,000 MW of electric power by 2050 – 10 percent of currently installed electric capacity. This compares with today's 2800 MW of installed capacity at existing U.S. geothermal power plants using today's technology. Expected program outcomes will include creation of a commercial-scale geothermal reservoir and power plant (approximately 5 MW in generating capacity) capable of operating for 7 years by 2015. This initial plant, followed by others in differing geologic environments, should foster rapid growth in the use of geothermal energy as predicted by the MIT study.

## BUILDING TECHNOLOGIES PROGRAM

The Building Technologies Program's FY 2009 request is $123.8 million, an increase of $14.8 million from the FY 2008 appropriation. The Building Technologies Program develops technologies, techniques, and tools for making residential and commercial buildings more energy efficient, productive, and cost-competitive. The Program's funding supports a portfolio of activities that includes solid state lighting (SSL), improved energy efficiency of other building components and equipment, and their effective integration using whole building system design techniques that will enable the design of net Zero Energy Buildings. The Program also includes the development of building codes and appliance standards and successful education and market introduction programs, including ENERGY STAR and EnergySmart Schools.

The Residential and Commercial Buildings integration components of the Building Technologies Program aim to transform the carbon footprint of the built environment through Zero Energy Buildings. The residential-focused Building America subprogram focuses on reducing total energy use in a new home by 60 to 70 percent. During FY 2009, research for production-ready new residential buildings that are 40 percent more efficient will continue for three climate zones, with completion in two. The Program's activities in the commercial sector are focused on alliances of leading market companies with national portfolios of buildings. The Program will engage with the developers of these buildings, which will provide the opportunity to better understand what R&D is needed to help promote the construction of highly efficient commercial buildings. DOE's role as convener of partnerships with developers and other key actors help promote leveraging of resources and encourage the private sector to undertake market transformation activities.

The Emerging Technologies subprogram seeks to develop cost-effective technologies for residential and commercial buildings that enable reductions in building energy use. Solid State Lighting will develop technologies that can help reduce commercial building lighting electricity consumption. Space Conditioning and Refrigeration R&D will continue work on innovative HVAC design concepts. Other highlights include highly insulating windows and building integrated solar heating and cooling systems.

The Equipment Standards and Analysis subprogram develops minimum energy efficiency standards that are technologically feasible and economically justified as required by law. Federal energy conservation standards that have gone into effect since 1988 are projected to save a cumulative total of 75 quadrillion Btus (quads) of energy by the year 2045 (in 2007, total annual

U.S. consumption of primary energy was about 103 quads). Between FY 2005 and FY 2007, the Department identified and carried out significant enhancements to rulemaking activities. The Department has made a commitment to clear the backlog of delayed actions that accumulated during prior years, while simultaneously implementing all new requirements of the Energy Policy Act (EPACT) of 2005. EISA significantly increases the number of efficiency standards and test procedures DOE must develop. The Department will continue to implement productivity enhancements that will allow multiple rulemaking activities to proceed simultaneously, while maintaining the rigorous technical and economic analysis required by statute. Energy conservation standards for 10 products were initiated in FY 2006 and 2007 that will continue in FY 2009. In FY 2008, efficiency standards rulemakings were initiated on 4 additional products. In FY 2008, DOE is proceeding simultaneously on rulemakings for 15 products and 10 test procedures. In FY 2009, 4 more standards and test procedures for 7 more products will be added.

The Technology Validation and Market Introduction subprogram funds activities that validate and promote clean, efficient, and domestic energy technologies. Expanding and modernizing the ENERGY STAR program to include solid state lighting, water heaters, photovoltaics, fuel cells, micro-wind turbines, combined heat and power, and other advanced technologies, as well as targeting the civic infrastructure (e.g., schools, hospitals, libraries, municipal facilities), are central activities that the Program carries out to invest in Energy Smart solutions. DOE will continue to work with the Environmental Protection Agency on the development and implementation of Energy Star and other efforts to minimize duplication and maximize efficiency. In addition to these efforts, the Program focuses on outreach efforts to help move specific technologies – such as solid-state lighting and high-performance windows – toward commercial applications. These efforts include design and rating tools, durability and product lifetime data, testing procedures, demonstrations, retailer education, and training on proper installation.

## INDUSTRIAL TECHNOLOGIES PROGRAM

The Industrial Technologies Program seeks to reduce the energy intensity (energy demand per unit of industrial output) of the U.S. industrial sector through coordinated research and development, validation, and technical assistance activities to increase dissemination of energy efficiency technologies and operating practices. The FY 2009 budget request for the Industrial Technologies Program (ITP) is $62.1 million, which is $2.3 million less than the FY 2008 appropriation. Internal funding shifts reflect a continued strategy to emphasize more effective ways to increase energy efficiency among energy intensive industries. The shift toward more crosscutting and higher impact R&D activities will allow ITP to develop advanced, energy-efficient technologies to serve a broader set of industries.

The program will continue to support the Secretary of Energy's "Easy Ways to Save Energy" campaign through the Save Energy Now (SEN) industrial energy savings assessments at the Nation's most energy-intensive industrial facilities. This has been a very successful activity, having reached its 24-month goal of conducting 450 assessments from 2006 through 2007. With 89 percent of the plants reporting results from these assessments, the program has identified savings of over 88 trillion Btus of source energy, including more than 71 trillion Btus of natural

gas, the amount used by almost a million U.S. homes. If implemented, the improvements recommended through SEN assessments have a potential energy savings of more than $727 million per year and could also reduce carbon dioxide emissions by 6.3 million metric tons annually, which is equivalent to taking over one million automobiles off the road

Building on this success, ITP will expand partnerships with leading corporations across major manufacturing supply chain and deliver DOE plant assessments, tools, and technologies to enable dramatic energy efficient improvements, contributing to the EPACT 2005 goal of reducing industrial energy intensity by 2.5% per year from 2006 to 2016.

FEDERAL ENERGY MANAGEMENT PROGRAM

The Federal Energy Management Program (FEMP) budget request for FY 2009 is $22 million, which is an increase of $2.2 million from the FY 2008 appropriation. FEMP enhances energy security, environmental stewardship, and cost reduction within the Federal Government through reductions in energy intensity in buildings, increased use of renewable energy, and greater conservation of water. These goals are accomplished by means of technical assistance, coordination of Federal reporting and evaluation, supporting alternative fuel use in the Federal vehicle fleet, and supporting the Secretary's Transformational Energy Action Management (TEAM) Initiative.

In a new effort this year, FEMP will support private sector development of alternative fuel stations at Federal sites, help the federal government identify opportunities for petroleum displacement to increase alternative fuel use, and conduct reporting and analysis of the Federal vehicle fleet. In addition, with DOE Specific Investments, FEMP will support the Secretary's TEAM Initiative, which will establish DOE as the Federal agency leader in strengthening energy and alternative fuels management. The TEAM Initiative works with DOE programs to help meet and exceed the goals of Executive Order 13423, such as a reduction of energy intensity of 30 percent by the end of FY 2015.

As part of the TEAM initiative, the Secretary has instructed all DOE sites to host private sector energy service companies to assess efficiency opportunities across the complex, addressing all lifecycle, cost-competitive options. DOE will lead by example, deploying a wide variety of lighting and other advanced technologies to achieve maximum energy savings. The Secretary's TEAM Initiative is bold and, as Congress looks to "green" the Capitol Complex, I would be pleased to provide additional information and periodic updates to this Committee on our efforts and actions.

WEATHERIZATION AND INTERGOVERNMENTAL ACTIVITIES PROGRAM

The FY 2009 request for Weatherization and Intergovernmental Activities is $58.5 million. Stakeholders and partners include state and local governments, Native American Tribes, utilities, and international agencies and governments.

Significant changes in the FY 2009 budget request include increases for the State Energy Program and the Asia Pacific Partnership, a refocusing for Tribal Energy Activities, and

conclusion of funding for the Weatherization Assistance Program (WAP) and the Renewable Energy Production Incentive. The results of DOE's weatherization assistance activities are little changed in the last two decades: provision of positive limited benefits to selected recipients, but failing to catalyze broader solutions for the tens of millions of eligible homes that have never received retrofits. The Department requests no funding for WAP activities; however, states can continue to support weatherization assistance activities with resources provided by the Low-Income Home Energy Assistance Program at the Department of Health and Human Services. Concluding the program at DOE will allow the Department to focus on higher priority research and development as well as state, local, and utility energy projects in the State Grants program. Through FY 2008, the Renewable Energy Production Incentive (REPI) provided financial incentive payments to publicly owned utilities, nonprofit electric cooperatives, and Tribal Governments and native corporations that own and operate qualifying facilities generating renewable electricity. The incentive value of REPI has diminished over time as renewable energy technologies have become competitive, rendering the program no longer necessary

In FY 2009, the State Energy Program will continue to include competitive grants for State policies and programs that increase adoption and compliance of advanced building energy codes, accelerate the use of performance contracting and alternative financing by state and local governments, and increase investments in utility delivered efficiency programs and other high priority EPACT 2005 and EISA programs.

The State Energy Program helps enable state governments to target their high priority energy needs and expand clean energy choices for their citizens and businesses. Benefits include reduced energy use and costs, environmentally conscious economic development, increased renewable energy generation capacity, and lessened reliance on imported oil. A combination of technical assistance, outreach, and financial assistance support effective program implementation of the National Action Plan for Energy Efficiency and provisions of EPACT 2005 and EISA.

FACILITIES AND INFRASTRUCTURE

The budget request for Facilities and Infrastructure supports operations and maintenance (O&M) for the National Renewable Energy Laboratory (NREL), a single-purpose laboratory dedicated to R&D for energy efficiency, renewable energy, and related technologies. The request for FY 2009 is $13.9 million: $10.0 million for core O&M (a $3.1 million increase) and $4.0 million required to complete Phase I construction of the Energy Systems Integration Facility (ESIF). This budget request represents a decrease of $62.2 million compared to the FY 2008 appropriation, primarily a reflection of Congress's FY 2008 provision of $54.5 million to initiate construction activities for the ESIF and to begin additional site infrastructure work. Funding beyond that which is requested for FY 2009 is not needed, as much of the construction taking place was fully funded in prior years. The remainder of the decrease is a result of including requested solar research capital equipment replacements within the Solar Energy Program budget, where such equipment is typically funded.

## CONCLUSION

The penetration of EERE technologies into the marketplace could save consumers over $600 billion by the year 2030 and save as much as $4 trillion by 2050, cumulatively. Similarly, the technologies in our portfolio could avoid 6 gigatons of carbon (GTC) by 2030 and nearly 50 GTC by 2050, cumulatively.[1] With action plans, performance milestones, clearly articulated deliverables, and continued performance, EERE's budget request supports priority R&D and the achievement of stated goals. Our laboratory products and partnerships will help bring cleaner energy technologies and sources to commercial viability in the foreseeable future.

[1] Energy Efficiency and Renewable Energy FY 2009 Congressional Budget, 20.

Mr. VISCLOSKY. Thank you very much.
Mr. Slutz.

MR. JAMES SLUTZ, ACTING PRINCIPLE DEPUTY ASSISTANT SECRETARY FOR FOSSIL ENERGY

Mr. SLUTZ. Thank you.
Mr. VISCLOSKY. [OFF MIKE]
Mr. SLUTZ. I served as the deputy assistant secretary for oil and natural gas since June of 2002, and then I moved in managing the Office of Fossil Energy in late October of last year, early November.
Mr. VISCLOSKY. [OFF MIKE] [Laughter.]
Mr. SLUTZ. Mr. Chairman, members of the subcommittee, it is a pleasure for me to appear before you today to present the Office of Fossil Energy's proposed budget for fiscal year 2009. FE's budget request of $1.127 billion for fiscal year 2009 is one of the largest fossil energy requests made by this administration. These funds will allow FE to fulfill its mission to create public benefits by enhancing U.S. economic, environmental and energy security.

Achieving this mission means developing technological capabilities that can dramatically reduce carbon emissions to achieve near-zero atmospheric emission power production, thereby meeting the president's priority of expanding our climate change options with high-efficiency power plants to reduce carbon dioxide emissions, and the near-zero emission power plant known as FutureGen that will link coal generation with carbon sequestration.

FE is also responsible for the management and operation of the nation's petroleum reserves, most notably the strategic petroleum reserve, which provides strategic and energy security against disruptions in oil supplies with an emergency stockpile of crude oil. More specifically, the proposed fiscal year 2009 coal budget request of $648 million focuses on technology allowing the United States to maintain its technological lead in coal use in a way that will not raise climate concerns. This is the largest budget request for coal research, development and demonstration in over 25 years.

The budget includes $406 million for coal R&D, including in-house research and development, $85 million for the clean coal power initiative, and $156 million for the new approach to the FutureGen program. The fiscal year 2009 request demonstrates the administration's continuing commitment to domestically produced energy from coal.

The $344 million fiscal year 2009 budget request for the strategic petroleum reserve, an $84 million increase over fiscal year 2008 approved funding, will allow for expansion activities at two existing storage sites and the development of a new site in fiscal year 2009. This expansion is in accordance with the provision in EPACT for an expansion of reserve capacity from 727 million to 1 billion barrels of oil, and with the president's recommendation and pending legislation to further increase the reserve's capacity to 1.5 billion barrels of oil.

Fossil energy research and development is directed at electric power generation from coal, our most abundant and lowest-cost domestic fossil fuel. This research supports many presidential initiatives and priorities, including the coal research initiative, hydrogen fuel initiative, climate change technology program, and FutureGen.

I will highlight a few of the R&D program components, beginning with FutureGen.

FutureGen promotes advanced, full-scale integration of integrated gasification combined cycle, or IGCC, and carbon capture and storage, or CCS; and technology to produce electric power from coal with near-zero atmospheric emissions. FutureGen is being restructured in a way that accelerates the commercial integration of CCS technologies and IGCC.

The new approach proposed multiple commercial-scale demonstration power plants in place of the originally planned single research and development facility. Each plant would produce electricity and sequester an estimated annual 1 million metric tons of carbon dioxide. FutureGen receives an $81.7 million increase in funding over last year in the fiscal year 2009 budget proposal.

The clean coal power initiative, or CCPI, is a cooperative cost-share program between the government and industry to demonstrate advanced coal-based power generation technologies. The budget request of $85 million for CCPI in fiscal year 2009 will complete the third round of project solicitations, proposal evaluations, and project selection of advanced technology systems.

The fiscal year 2009 budget request of $149 million for carbon sequestration—one of the key components of our program—is a significant increase over the nearly $119 million for fiscal year 2008. The increase should help develop economical ways to separate and permanently sequester greenhouse gas emissions from the combustion of fossil fuels.

Consistent with recent budget requests, the petroleum and oil technology and natural gas technology research and development programs are proposed for termination in fiscal year 2009. The fiscal year 2009 budget request of $344 million for the strategic petroleum reserve includes $158 million for preparations to reach the 1 billion barrel storage capacity and increase draw-down capability from 4.4 million barrels a day to more than 6 million barrels a day, as mandated by EPACT. We are also requesting $13.5 million, which is aimed at the expansion above that to the 1.5 billion goal.

That concludes a very brief overview of fossil energy's wide-ranging R&D and petroleum reserve management responsibilities. I would like to emphasize that by reevaluating, refining and refocusing our programs and funding the most cost-effective and beneficial projects, the fiscal year 2009 budget submission meets the nation's critical need for energy, environmental and national security.

Mr. Chairman and members of the subcommittee, I would be happy to answer any questions.

[Statement of James Slutz:]

**Statement by James Slutz**
**Acting Principal Deputy Assistant Secretary for**
**Fossil Energy**
**U.S. Department of Energy**
**House Appropriations Subcommittee on Energy and Water Development and**
**Related Agencies**
**March 11, 2008**

Mr. Chairman, Members of the Committee, it is a pleasure for me to appear before you today to present the Office of Fossil Energy's (FE) proposed Budget for Fiscal Year 2009.

FE's budget request of $1.127 billion for Fiscal Year 2009 is one of the largest FE requests made by this Administration. These funds will allow FE to fulfill its mission: to create public benefits by enhancing U.S. economic, environmental, and energy security.

Achieving this mission means developing technological capabilities that can dramatically reduce carbon emissions to achieve near-zero atmospheric emissions power production, thereby meeting the President's priority of expanding our climate change options with higher-efficiency power plants to reduce carbon dioxide and other emissions, including through FutureGen demonstration plants.

FE is also responsible for the management and operation of the nation's petroleum reserves, most notably the Strategic Petroleum Reserve, which provides strategic and economic security against disruptions in oil supplies with an emergency stockpile of crude oil.

More specifically, the proposed FY 2009 coal budget request of $648 million focuses on technology allowing the United States to maintain its technological lead in coal use in a way that addresses climate concerns. This is the largest budget request for coal research development and demonstration in over 25 years and leverages a nearly $1 billion investment in Clean Coal Technology.

The budget includes $406.5 million for Coal R&D including in-house R&D; $85 million for the Clean Coal Power Initiative and $156 million for a new approach to the FutureGen program.

The Fiscal Year 2009 request demonstrates the Administration's continuing commitment to domestically produced energy from coal. Combined with the required private sector cost sharing contribution as directed by the Energy Policy Act of 2005 (EPACT), this budget will bring the total public and private investment in coal technology leveraged by FE to nearly $1 billion. In addition, the federal government provides support to advance coal technologies through tax incentives for clean coal plants, and through loan guarantees to be allocated to various types of coal power and other gasification projects.

The $344 million Fiscal Year 2009 budget request for the Strategic Petroleum Reserve, an 84 percent increase over Fiscal Year 2008 approved funding, will allow for expansion activities at two existing storage sites and the development of a new site in FY 2009. This expansion is in accordance with the provision in EPACT for an expansion of reserve capacity from 727 million to one billion barrels of oil, and with the president's recommendation to further increase the reserve's capacity to 1.5 billion barrels of oil.

FOSSIL ENERGY RESEARCH AND DEVELOPMENT

I will begin the detailed presentation of our proposed budget with the work of Fossil Energy Research and Development (FERD), which is directed at electric power generation from coal, our most abundant and lowest cost domestic fossil fuel. Coal today accounts for nearly one-quarter of all the energy -- and about half the electricity – consumed in the United States.

FERD supports many Presidential initiatives and priorities including the Coal Research Initiative, Hydrogen Fuel Initiative, and FutureGen. FERD also supports the Climate Change Technology Program, which is a priority for the Department. The components of the FERD program begin with FutureGen.

FUTUREGEN

FutureGen promotes advanced, full-scale integration of integrated gasification combined cycle (IGCC) and carbon capture and storage technology to produce electric power from coal while capturing and sequestering carbon dioxide ($CO_2$), resulting in near-zero atmospheric emissions coal energy systems. FERD is restructuring FutureGen in a way that accelerates the commercial use of carbon capture and storage technologies.

The new approach proposes multiple 300-600 Megawatt (MW) commercial-scale demonstration clean coal power plants – as opposed to a single, 275 MW R&D facility - each producing electricity and capturing and safely sequestering at least an estimated annual one million metric tons of $CO_2$ from each. FutureGen receives an $81.7 million funding increase from Fiscal Year 2008 in the Fiscal Year 2009 budget proposal.

CLEAN COAL POWER INITIATIVE

The Clean Coal Power Initiative (CCPI) is a cooperative, cost-shared program between the government and industry to demonstrate advanced coal-based power generation technologies. CCPI is now focused on projects to help accelerate development and deployment of coal technologies that could economically capture carbon dioxide, including increasing the efficiency and reliability of carbon capture technologies. CCPI allows the nation's power generators, equipment manufacturers, and coal producers to help identify the most critical barriers to coal use and the most promising advanced technologies to use coal cleanly, affordably, and with higher efficiencies that reduce carbon intensity.

The budget request of $85 million for CCPI in Fiscal Year 2009 will complete the third round of project solicitations, proposal evaluations, and project selections of advanced technology systems that capture carbon dioxide for sequestration or beneficial reuse.

SEQUESTRATION

The Fiscal Year 2009 budget request of $149 million for carbon sequestration, one of the key components of the Fuel and Power Systems program, is an increase of $30 million over the $119 million provided in Fiscal Year 2008.

The increase should help develop economical ways to separate and permanently store (sequester) greenhouse gas emissions from the combustion of fossil fuels. The technologies will help existing and future fossil fuel power generating facilities by reducing the cost of electricity impacts and also providing

protocols for carbon capture and storage demonstrations to capture, transport, store, and monitor the $CO_2$ injected in geologic formations.

The increase will support site selection and characterization, regulatory permits, community outreach, and completion of site operations plan for large-scale, geologic, carbon storage tests. It will also fund large-scale injections and remaining infrastructure development. The additional funding also permits work on capture projects and initiates an effort to prepare for and augment the monitoring, measurement and verification being conducted in the Phase III tests.

HYDROGEN

The budget request of $10 million in Fiscal Year 2009 for hydrogen from coal -- a clean fuel for future advanced power technologies such as fuel cells and transportation systems – is down nearly $15 million from Fiscal Year 2008. The decrease is due to the elimination of integrated coal-biomass processing for carbon emissions research (which is generally advanced through the gasification program), elimination of substitute natural gas and coal-to-liquids production research (which are mature industries and not the high-return investment that FE focuses on), and a right-sizing of the effort level for early engineering and design studies on hydrogen production modules in near-zero emission coal plants.

GASIFICATION TECHNOLOGY

The Integrated Gasification Combined Cycle (IGCC) budget request for Fiscal Year 2009 is $69 million, a $15.5 million increase over Fiscal Year 2008. The IGCC program develops advanced gasification-based technologies aimed at reducing the cost of coal-based IGCC plants, improving thermal efficiency, and

achieving near-zero atmospheric emissions of all pollutants. These technologies will be an integral part of the carbon capture and storage demonstration projects.

FUEL CELLS

Flexible fuel cell systems that can operate in central coal-based power systems and with applications for electric utility, industrial and commercial/residential markets, receive a funding request of $60 million in Fiscal Year 2009 - an increase over the Fiscal Year 2008 appropriation of $55.5 million. This activity enables the generation of highly efficient, cost-effective electricity from domestic coal with near-zero atmospheric emissions of carbon and air pollutants in central station applications. The technology also provides the technology base to permit grid-independent distributed generation applications.

OIL AND NATURAL GAS TECHNOLOGY

Consistent with the budget requests for Fiscal years 2006, 2007 and 2008, the Petroleum - Oil Technology and Natural Gas Technologies research and development programs are being terminated in Fiscal Year 2009.

The Ultra-Deepwater and Unconventional Gas and Other Petroleum Research Fund was created by the Energy Policy Act of 2005 (Public Law 109-58) as a mandatory program beginning in Fiscal Year 2007. The program is funded from mandatory federal revenues from oil and gas leases. Consistent with the Fiscal Year 2007 and 2008 budget requests, the Fiscal Year 2009 budget proposes to repeal the program through a legislative proposal.

STRATEGIC PETROLEUM RESERVE

The Strategic Petroleum Reserve (SPR) exists to ensure America's readiness to respond to severe energy supply disruptions. The Energy Policy Act of 2005 directs DOE to fill the SPR to its authorized 1 billion barrel capacity as expeditiously as practicable. Additionally the President has proposed expanding the Reserve's capacity to 1.5 billion barrels.

The Fiscal Year 2009 budget request of $344 million would continue preparations for doubling the current 727 million barrel capacity of to 1.5 billion barrels, and increasing the drawdown capability from 4.4 million barrels per day (MMB/day) to more than 6 MMB/day. Increasing the inventory to 1 billion barrels requires expanding two existing sites and adding one new site.

The Fiscal Year 2009 budget request reflects completion of land acquisition activities for the Richton, Mississippi site in Fiscal Year 2008 and the addition of expansion activities at the two existing sites and the new site in Fiscal Year 2009.

NORTHEAST HOME HEATING OIL RESERVE

The Fiscal Year 2009 budget request of $9.8 million will fund continuing operation of the Reserve and the leasing of commercial storage space.

The President directed DOE in 2000 to establish a Northeast heating oil reserve which is capable of assuring a short-term supplement to private home heating oil supplies during times of very low inventories or in the event of significant threats to immediate energy supplies. The two million barrel Reserve protects the Northeast against a supply disruption for up to 10 days, the time required for ships to carry heating oil from the Gulf of Mexico to New York Harbor.

NAVAL PETROLEUM AND OIL SHALE RESERVES

The Fiscal Year 2009 budget request of $19.1 million is slightly less than the Fiscal Year 2008 request of $20.3 million. The decrease is due to the completion of the Risk Assessment and Corrective Action Studies to determine the cleanup requirements of the Elk Hills site (NPR-1) and reductions in operating and facility maintenance costs at NPR-3.

The Naval Petroleum and Oil Shale Reserve (NPOSR) mission is to complete environmental remediation activities and determine the equity finalization of NPR-1 and to operate NPR-3 until its economic limit is reached, while maintaining the Rocky Mountain Oil Field Test Center as a field demonstration facility. Because the NPOSR no longer served the national defense purpose envisioned in the early 1900s, the National Defense Authorization Act for Fiscal Year 1996 (P.L. 104-106) required the sale of the government's interest in Naval Petroleum Reserve 1 (NPR-1).

To comply with this requirement, the Elk Hills field in California was sold to Occidental Petroleum Corporation in 1998, two of the Naval Oil Shale Reserves (NOSR-1 and NOSR-3) were transferred to the Department of the Interior's (DOI) Bureau of Land Management, and the NOSR-2 site was returned to the Northern Ute Indian Tribe.

The Energy Policy Act of 2005 transferred administrative jurisdiction and environmental remediation of Naval Petroleum Reserve 2 (NPR-2) in California to the Department of the Interior. DOE retains the Naval Petroleum Reserve 3 (NPR-3) in Wyoming (Teapot Dome field). Environmental remediation is

performed on those facilities which no longer have value to either of the missions.

MEETING THE NATION'S CRITICAL ENERGY NEEDS

In conclusion, I'd like to emphasize that the Office of Fossil Energy's programs are designed to promote the cost-effective development of energy systems and practices that will provide current and future generations with energy that is clean, efficient, reasonably priced, and reliable. Our focus is on supporting the President's top priorities for energy security, clean air, climate change, and coal research. By reevaluating, refining and refocusing our programs and funding the most cost-effective and beneficial projects, the Fiscal Year 2009 budget submission is designed to help meet the Nation's needs for energy, environmental and national security.

Mr. Chairman, and members of the Committee, this completes my prepared statement. I would be happy to answer any questions you may have at this time.

END

Mr. VISCLOSKY. Thank you very much.
Mr. Kolevar.

MR. KOLEVAR'S OPENING STATEMENT

Mr. KOLEVAR. Mr. Chairman, Ranking Member Hobson, and members of the committee, thank you for the opportunity to testify on the president's fiscal year 2009 budget request for the Office of Electricity Delivery and Energy Reliability.

Our office's mission is to lead national efforts to modernize the electricity delivery system, enhance the security and reliability of America's energy infrastructure, and facilitate recovery from disruptions to energy supply. These functions are vital to the Department of Energy's strategic goal of protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable and environmentally responsible energy.

The president's 2009 budget requests $134 million for OE, a 17 percent increase from the fiscal year 2008 request. This includes $100.2 million for research and development activities, $14.1 million for operations and analysis activities, and $19.7 million for program direction.

Today, the availability of and access to electricity is something that can be easy to take for granted. While more than a few people cannot describe what it is or where it comes from, electricity is vital to nearly every aspect of our lives, from powering our electronics and heating our homes, to supporting transportation, finance, food and water systems, and national security.

The Energy Information Administration has estimated that by the year 2030, U.S. electricity consumption will be almost 25 percent higher than it was in 2009. This indicates a growing economy, but it also promises a significant amount of new demand on the electricity infrastructure, an infrastructure that is already stressed and aging. This means that we need to focus our attention on reliability.

Climate change is also affecting electric industry investments. Uncertainty on climate change legislation and policy is limiting investment in generation from fossil fuels—coal in particular—and is stimulating investment in renewables such as wind. However, intermittent resources such as renewables require energy storage or other balancing technologies, advanced communications, and sophisticated modeling to maximize penetration without affecting the reliability and efficiency of our electric system.

OE's 2009 budget request reflects a commitment to ensuring this reliability by supporting the research of breakthrough technologies such as those associated with the Smart Grid and Energy Storage. With $5 million dedicated solely to Smart Grid development, a $6.6 million increase in the 2009 request for energy storage, and more than $88 million dedicated to other R&D work, the president's budget request reaffirms the effort to ensure increased reliability through research and development.

Modernizing the grid through technical innovation, however, represents just one side of the effort needed to tackle electricity reliability problems. Building the elaborate network of wires and other facilities needed to deliver energy to consumers reliably and safely is perhaps one of our greatest challenges today. This is especially

true since renewable energy promises to become a substantial generation source. Since sources of renewable energy are often found in remote locations, we simply have to develop the capacity to deliver it to load centers. Basically, if we want to use more renewable energy, we need more wires.

Accordingly, in 2009 this office will continue work to implement the major electricity infrastructure provisions of the Energy Policy Act of 2005. Consistent with the law, we will produce the second national transmission congestion study by August of next year. We will begin scoping for the designation of energy transport corridors in the eastern states, and we will implement the department's responsibilities to coordinate federal authorization for the siting of transmission facilities.

However, energy security and reliability will not be solved solely through the modernization and expansion of our energy infrastructure. We also need to ensure energy delivery by keeping it secure and responding quickly when it is disrupted. In 2009, we will work to identify system-wide vulnerabilities and power and fuels at key domestic and select foreign energy facilities, and develop plans to secure and reconstitute those assets.

Finally, we will help to develop tools and mitigation solutions to help energy sector owners and operators improve resiliency and implement best and effective practices and provide solutions to state and local governments to address energy supply and infrastructure challenges, and to exercise those response plans.

Mr. Chairman, I believe OE's work is critical to our nation's energy future, and the increase in the president's budget request reflects this. Federal investment in the research, development and deployment of new technology, combined with innovative policies and infrastructure investment, is essential to improving grid performance and ensuring our energy security, economic competitiveness, and environmental well being.

Mr. Chairman, this concludes my statement. I look forward to taking the committee's questions.

[Mr. Kolevar's written statement follows:]

**Statement of Kevin M. Kolevar**
**Assistant Secretary for Electricity Delivery & Energy Reliability**
**U.S. Department of Energy**
**FY 2009 Appropriations Hearing**

**House Committee on Appropriations**
**Subcommittee on Energy and Water Development**
**March 11, 2008**

Mr. Chairman and members of the Committee, thank you for this opportunity to testify on the President's Fiscal Year (FY) 2009 budget request for the Office of Electricity Delivery and Energy Reliability.

The mission of the Office of Electricity Delivery and Energy Reliability (OE) is to lead national efforts to modernize the electricity delivery system, enhance the security and reliability of America's energy infrastructure, and facilitate recovery from disruptions to energy supply. These functions are vital to the Department of Energy's (DOE) strategic goal of protecting our national and economic security by promoting a diverse supply and delivery of reliable, affordable, and environmentally responsible energy.

The President's FY 2009 budget includes $134 million for OE in FY 2009, which is almost a 17% increase from the FY 2008 request. This includes $100.2 million for Research and Development activities, $14.1 million for Operations and Analysis activities, and $19.7 million for Program Direction. My testimony on the Administration's FY 2009 budget request reflects a comparison to the Administration's FY 2008 budget request.

Today, the availability and access to electricity is something that most Americans take for granted. Most people cannot describe what it is or where it comes from. Yet, it is vital to nearly every aspect of our lives from powering our electronics and heating our homes to supporting transportation, finance, food and water systems, and national security.

The Energy Information Administration has estimated that by the year 2030, U.S. electricity consumption will be almost 25% higher than it was in 2006. This indicates a growing economy, but it also promises a significant amount of new demand on the electricity infrastructure- an infrastructure that is already stressed and aging. This means that we need to focus our attention on reliability.

Climate change is also affecting electric industry investments. The uncertainty in climate change legislation and policies is limiting investment in generation from fossil fuels and is stimulating investment in renewables such as wind. However intermittent resources such as renewables require energy storage or other balancing technologies, advanced communications and sophisticated modeling to maximize penetration without affecting the reliability and efficiency of our electric system.

One of the Department's strategies for reducing our dependence on foreign oil is increased electrification by transitioning to electric vehicles also known as plug-in hybrids. Plug-in hybrids could provide a great opportunity if we begin now to enable smart grid features such as enhanced intelligence and control.

Title 13 and section 641 of the Energy Security and Independence Act of 2007 highlights the need for the development of a modernized grid. Title 13 addresses the need for a Smart Grid, which is a transmission and distribution network modernized with the latest digital and information technologies for enhanced operational monitoring, control, and intelligence.

OE's FY 2009 budget request also reflects a commitment to ensuring reliability by supporting research of breakthrough technologies such as those associated with a Smart Grid and Energy Storage. With $5 million dedicated solely to Smart Grid development, a $6.6 million dollar increase in the FY2009 request for Energy Storage, and more than $88 million dedicated to other R&D work, the President's FY2009 Budget Request reaffirms the effort to ensure increased reliability through R&D.

Modernizing the grid through technical innovation, however, represents just one side of the effort needed to tackle electricity reliability problems. Building the elaborate network of wires and other facilities needed to deliver energy to consumers reliably and safely is perhaps one of our greatest challenges today. This is especially true since renewable energy promises to become a substantial generation source. Since sources of renewable energy are often found in remote locations, we simply have to develop the capability to delivery it to load centers. Basically, if we want to use more renewable energy, we need more wires.

However, energy security and reliability will not be solved by focusing soley on expanding our modernization and expansion of our energy infrastructure. We also need to ensure energy delivery by keeping it secure and responding quickly when it is disrupted. DOE is the lead agency when Federal response is required for temporary disruptions in energy supply to ensure a reliable and secure electricity infrastructure for every American. We will use FY2009 funds to apply technical expertise to ensure the security, resiliency and survivability of key energy assets and critical energy infrastructure at home and abroad.

The reliability and energy security effort is both multifaceted and necessary, and the President's request reflects this.

## RESEARCH AND DEVELOPMENT

Our High Temperature Superconductivity activities continue to support second generation wire development as well as research on dielectrics, cryogenics, and cable systems. This activity is being refocused to address a near-term critical need within the electric system to not only increase current carrying capacity, but also to relieve

overburdened cables elsewhere in the local grid. The superconductivity industry in the United States is now at the critical stage of moving from small business development to becoming a part of our manufacturing base.

Enhanced security for control systems is critical to the development of a reliable and resilient modern grid. The Visualization and Controls Research & Development activity focuses on improving our ability to measure and address the vulnerabilities of controls systems, detect cyber intrusion, implement protective measures and response strategies, and sustain cyber security improvements over time.

This activity is also developing the next generation system control and data acquisition (SCADA) system that features GPS-synchronized grid monitoring, secure data communications, custom visualization and operator cueing, and advanced control algorithms. Advanced visualization and control systems will allow operators to detect disturbances and take corrective action before problems cascade into widespread outages. The need to improve electric power control systems security is well-recognized by both the private and public sectors.

The Energy Storage and Power Electronics activities propose an increase of $6.6 million in FY 2009. This will support the development of new and improved energy storage devices and systems at utility scale, which will be incorporated in DOE's Basic Energy Science basic research results. We will also work to achieve substantial improvements in seeking lifetime, reliability, energy density, and cost of energy storage devices. Through this, highly leveraged prototype testing and utility demonstration projects will be expanded with state energy office participation focusing on areas of greatest utility need. The increase will also serve to focus on enhanced research in Power Electronics to improve material and device properties needed for transmission-level applications.

Large scale, megawatt-level electricity storage systems, or multiple, smaller distributed storage systems, could significantly reduce transmission system congestion, manage peak loads, make renewable electricity sources more dispatchable, and increase the reliability of the overall electric grid.

The Renewable and Distributed Systems Integration activities will allocate $5 million in FY 2009 to develop and demonstrate Smart Grid technologies for an integrated and intelligent electric transmission and distribution network. $28.3 million will be used to demonstrate distributed energy systems as a resource to decrease peak electric load demand, increase asset utilization, and defer electric system upgrades. These funds will also be used to develop renewable energy grid integration technologies to facilitate increased deployment of renewables and other clean energy sources.

## PERMITTING, SITING, AND ANALYSIS

With hopes of creating a more robust transmission system, our FY 2009 budget request asks for $6.5 million for the Permitting, Siting and Analysis office. This is an $804 thousand increase from the FY 2008 budget request, and it will help to implement major electricity infrastructure provisions such as section 368 of EPACT and section 216(h) of the Federal Power Act. Further, work will be done to provide technical assistance to state electricity regulatory agencies and to electric utilities as they implement their energy efficiency initiatives.

In FY 2009, we will also be working to issue the second national transmission congestion study. In this process, we will be consulting with states and other interested parties on congestion metrics and data, and analyzing current historical congestion by region. Before the study is released, we will present draft conclusions of data analysis for public review and input.

The implementation of section 368 of EPACT requires the designation of rights-of-way corridors for the transport of oil, natural gas, hydrogen, and electricity on Federal lands in the eleven contiguous Western States. An interagency team, with DOE as the lead agency, conducted public scoping meetings concerning the designation of corridors in each of the eleven contiguous Western States. We have published a draft Programmatic Environmental Impact Statement for the designation of the energy transport corridors, solicited public comments, and conducted 15 public meetings, and the final PEIS is expected to be published in FY 2008. We are preparing to begin scoping for the designation of energy transport corridors in the Eastern States, Alaska, and Hawaii. The EIS for the remaining designations is expected before the end of FY 2009.

DOE is preparing regulations to implement its responsibilities under the new section 216(h) of the Federal Power Act to coordinate with eight other Federal agencies to prepare initial calendars, with milestones and deadlines for the Federal authorizations and related reviews required for the siting of transmission facilities. DOE will maintain a public website that will contain a complete record of Federal authorizations and related environmental reviews and will work closely with the lead Federal NEPA agency to encourage complete and expedited Federal reviews.

## INFRASTRUCTURE SECURITY AND ENERGY RESTORATION

The President has designated the Department of Energy as the Lead Sector Specific Agency responsible for facilitating the protection of the Nation's critical energy infrastructure. The Office of Infrastructure Security and Energy Restoration (ISER) in the Operations and Analysis subprogram is responsible for coordinating and carrying out the Department's obligations to support the Department of Homeland Security in this important national initiative. The FY 2009 request is for $7.6 million in funding for Infrastructure Security and Energy Restoration within the Operations and Analysis subprogram, which is a $1.8 million increase from the FY 2008 request.

In FY 2009, ISER will work to identify system-wide vulnerabilities in power, fuels and other key energy sector assets and develop plans to secure and reconstitute those assets. We will help to develop tools and mitigation solutions to help energy sector owners and operators improve resiliency and implement best and effective practices, and provide solutions to state and local governments to address energy supply and infrastructure challenges. Further, we will continue to conduct vulnerability assessments of key domestic and selected foreign energy facilities in close collaboration with appropriate interagency and industry partners. And through the initialization of selected pilot projects, we will work to exercise the integration of regional, state and local energy resiliency and emergency response preparedness

We help to facilitate energy restoration efforts at the state and local level through cooperation and partnerships with local utility providers in support of the National Response Framework. In FY 2009, we will work to create detailed Concept of Operations Plans for energy response utilizing an Integrated Planning System

## CONCLUSION

As you have heard, our work in OE is vital to our Nation's energy health and the increase in the President's request reflects this. Through our research and development of technologies such as power electronics, high temperature superconductivity, and energy storage, we will work to lower costs, increase efficiency, and also directly enhance the viability of clean energy resources by addressing issues such as intermittency, controllability, and environmental impact.

Federal investment in the research, development, and deployment of new technology combined with innovative policies and infrastructure investment, is essential to improving grid performance and ensuring our energy security, economic competitiveness, and environmental well-being.

This concludes my statement, Mr. Chairman. I look forward to answering any questions you and your colleagues may have.

Mr. VISCLOSKY. Gentlemen, thank you very much.

I am going to recognize Mr. Hobson in just 1 second. But for the record, I would point out that Mr. Slutz is on one end of the table and Mr. Kolevar is on the other. I don't know if body language means anything, but I recognize from your resumes that Mr. Slutz is an Ohio State graduate.

Mr. SLUTZ. I am.

Mr. VISCLOSKY. Which makes Mr. Hobson pleased. And Mr. Kolevar is a Michigan graduate. I just want to make note that they did not sit next to each other during your testimony. [Laughter.]

At the beginning, I also want to acknowledge that we received a very nice gift from Mr. Simpson when he came in and that is a Boise State University pen, because he wanted me to have at least one pen from a winning football program. [Laughter.]

Mr. HOBSON. And I asked him if they were accredited yet. [Laughter.]

Mr. VISCLOSKY. I will now recognize Mr. Hobson.

CONGRESSIONAL DIRECTION

Mr. HOBSON. Mr. Karsner, when the secretary testified before this subcommittee last week, we confronted him on the department's failure to follow congressional direction. You are now about to share that experience. Between the House report and the conference report accompanying the 2008 Omnibus, we provided over a dozen directives to your office. I won't embarrass you by asking you to identify each of those directives, but I do have a set of related questions.

Do you view report language as binding on your office or merely advisory and something you can ignore at your discretion?

Mr. KARSNER. Well, congressman——

Mr. HOBSON. You can answer yes or no. I don't care.

Mr. KARSNER. It seems a legal question for general counsel. I will tell you my personal feeling is that the Congress makes the rules and we implement and enforce them. I don't know how to comment on the report language itself.

Mr. HOBSON. Do you believe you are complying 100 percent with the directive Congress has given your office?

Mr. KARSNER. That is our objective.

Mr. HOBSON. Please provide for the record a report identifying all the directives to your office contained in the separate House and Senate reports for 2008, as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act for 2008, and document the status of your compliance with those directives. I would like the same reports back from Mr. Kolevar's office and from Fossil Energy.

Mr. KARSNER. Yes, sir.

[Insert for the record]

CONGRESSIONAL DIRECTION

Below I have provided all of the directives contained in the House and Senate FY2008 reports as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act, 2008.

House Directives

1. "The Committee directs DOE to implement an aggressive program to take advantage of the Historically Black Colleges and Universities and Hispanic Serving Institutes across the country in order to deepen the recruiting pool of diverse scientific and technical staff available to support the growing renewable energy marketplace."

   Status: Minority academic institutions are eligible to apply under EERE's competitive solicitations. In certain topic areas where appropriate, such as Topic Area 3 of the $7.5 million water power solicitation announced in May 2008, special consideration will be given to applications from minority academic institutions.

2. "The Committee directs that $10,000,000 of the building energy code increase in the Building technologies program be directed to state compliance programs as authorized under Section 128 of EPACT 2005."

   Status: The Department could not comply with the House Committee report language because there was no building energy code increase provided for in the FY 2008 Consolidated Appropriations Act. All funding beyond the FY 2008 Presidential Budget Request for the Building Technologies Program has been allocated as directed by report language accompanying the FY 2008 Consolidated Appropriations Act, as follows: $10 million to Residential and Commercial R&D, $5 million to Solid State Lighting R&D, and $8.544 million to equipment standards.

3. "The Secretary of Energy is directed to make FY08 Weatherization funding available from October 1, 2007 to March 31st, 2009, for states that submit plans requesting funds allocations for all or part of this period."

   Status: As part of its annual issuance of grant guidance for FY 2008 program year, the Department included the provision as requested by Congress, making it an option for States.

4. "The Committee directs the Department to establish a director for Indian Energy Policy and Programs to provide much needed coordination of the Department's activities and services to assist Indian tribes in developing their energy resources."

   Status: The Department has appointed Steven Morello as the Deputy Assistant Secretary for Intergovernmental and External Affairs, who is focused on standing up the Office of Indian Energy Policy and Programs as authorized by the Indian Tribal Energy Development and Self-Determination Act of 2005.

Senate Directives

1. "The Secretary of Energy is directed to make fiscal year 2008 Weatherization funding available from October 1, 2007 to March 31st, 2009, for states that submit plans requesting allocations for all or part of this period."

   Status: As part of its annual issuance of grant guidance for the FY 2008 program year, the Department included the provision as requested by Congress, making it an option for States.

Consolidated Appropriations Act Directives

1. "The Department is directed to fund $45,000,000 for advanced combustion engine research and development, $40,000,000 for materials technology, $18,000,000 for fuels technology, and $17,000,000 for technology integration."

   Status: As requested, the Department has allocated $45,000,000 for research and development of advanced combustion engines, $40,000,000 for materials, $18,000,000 for fuels, and $17,000,000 for technology integration.

2. "The agency should within available funds competitively bid an award for the Advanced Vehicle Testing Activity within the FreedomCAR and Vehicle Technologies Program to independently test and evaluate all vehicles developed in the upcoming plug-in hybrid electrical vehicle demonstration."

   Status: The Department is carrying out this request. The current contract for the Advanced Vehicle Testing Activity was competitively awarded in 2005 and will be recompeted when the current contract expires in FY 2009. EERE has issued a competitive solicitation for PHEV demonstration and will make award selections in early summer 2008. Data collection from the vehicles in the demonstration program is an important element of this activity, and these vehicles will be tested by the Advanced Vehicle Testing Activity.

3. "The Office of EERE is directed to reconstitute a distributed energy research and development program, and direct $10,000,000 of the increase for the advanced reciprocating engines system program and $5,000,000 for the combined heat and power program."

   Status: With its FY 2008 funding, EERE expects to establish some research projects in advanced reciprocating engine systems. EERE will also fund research efforts for accelerating the development and deployment of innovative combined heat and power solutions, including assistance for the Regional Clean Energy Application Centers (formerly titled CHP Regional Application Centers).

4. "The agency should, within available funds, provide no less than $3,700,000 for steel in the industries (specific) program."

   Status: Funding at the requested level is being provided to support continuing steel research projects and for the solicitation of collaborative research projects focusing on transformational iron and steel technologies areas having the largest potential for energy and carbon footprint reduction.

5. "[The agency should, within available funds, provide no less than] $3,000,000 for the information technology industry, from chip scale to data centers."

   Status: EERE has provided this funding and is planning a variety of activities aimed at improving the energy efficiency of the U.S. information technology industry in FY 2008. In data centers, collaborative activities with industry are focusing on developing tools to characterize energy use and identify opportunities for improvement, developing measurement protocols to define energy performance, conducting training seminars, and for testing of innovative power conditioning and cooling technologies.

6. "Within available funds, the Office of EERE should establish a FACA-chartered Federal Advisory Council to advise the Office of EERE for Finance, Investment and Technology Deployment."

   Status: EERE is consulting with the Department's General Counsel regarding the establishment of this FACA.

7. "Any changes in [the Weatherization] program implementation should be proposed to Congress in the Department's budget submission and not implemented before Congressional approval is obtained."

Status: At the present time, DOE/EERE anticipates no changes in the FY 2008 Weatherization Assistance Program for Low Income People that will require approval by Congress.

8. "[T]he agency should redirect the remaining $742,500 of prior year funds from the Tower Power Project to fund the University of Maryland Energy Research Center."

   Status: Consistent with this request, EERE deobligated the funding for the Tower Power Project. Funds are at DOE headquarters and will be redirected to fund the University of Maryland Energy Research Center.

CONGRESSIONAL DIRECTION

We found only one directive in these documents. The Committee encouraged the Office of Electricity Delivery and Energy Reliability to identify the potential energy savings that may be achieved as a result of locating generating facilities closer to the users. As noted in EIA's Annual Energy Review 2006 on page 221, transmission and distribution losses, or electricity losses that occur between the point of generation and delivery to the customer, are estimated as 9 percent of gross generation. These losses will be reduced as generating facilities are located closer to the user. This potential benefit of distributed generation, along with many other potential benefits, are discussed in the study conducted by the Office of Electricity Delivery and Energy Reliability pursuant to Section 1817 of the Energy Policy Act of 2005, "THE POTENTIAL BENEFITS OF DISTRIBUTED GENERATION AND RATE-RELATED ISSUES THAT MAY IMPEDE THEIR EXPANSION (February 2007)".

CONGRESSIONAL DIRECTION

In response to your request, the Office of Fossil Energy has the following directives to report on items other than the listing of congressionally directed projects.

The Senate Report on the Energy and Water Appropriations Bill, 2008 Senate Bill S.175 (S. Rept. 110-127), contains no congressional guidance relating to the Office of Fossil Energy.

The House Report on the Energy and Water Development Appropriations Bill, 2008 House Bill H.R. 264 (H. Rept. 110-185, Part 2) contains the following guidance relating to the Office of Fossil Energy:

- Liquefied Natural Gas (LNG) Report. The Committee requests that Department of Energy (DOE) incorporate several specific key issues, including cascading failure, comprehensive modeling, risk tolerability assessments, vulnerability of containment systems, mitigation techniques, the effect of sea water coming in as LNG flows out, and the impact of wind, weather and waves in its current LNG study. Under the Consolidated Appropriations Act, 2008, the study is due on December 1, 2008.

- Clean Coal Power Initiative (CCPI). The Committee requests that DOE recast the CCPI to provide more support for demonstration of carbon capture, transport technologies and carbon sequestration.

- FutureGen. The Committee requests that DOE optimize the project design of FutureGen to support a proper sequestration demonstration and to provide a total life-cycle cost and project baseline for the streamlined FutureGen demonstration project by 120 days of enactment of the legislation.

- Fuels and Power Systems. The Committee requests that DOE focus research and design (R&D) efforts on $CO_2$ capture technology for existing pulverized coal (PC) combustion plants and to undertake large scale carbon sequestration experimental projects in reservoirs that are instrumented, monitored, and analyzed to verify the practical reliability and implantation of sequestration.

The Department is taking meaningful and substantial steps to comply with the above requests, including the following:

LNG. As noted above, the Consolidated Appropriations Act, 2008, directed the Department to submit to the House and Senate Committees on Appropriations a report on LNG, as outlined in the House Report, by December 1, 2008. In furtherance of this report, the Congress has appropriated $7.9 million to DOE's Office of Fossil Energy to conduct large scale LNG pool fire experiments on water and to conduct cascading (multi-tank) failure analysis of an LNG vessel resulting from cryogenic and thermal damage. Large scale LNG pool fire experiments will generate data on fire parameters such as thermal flux, flame height, burn rate, and smoke generation and shielding as a function of pool size. This data will provide decision makers with relevant information needed to accurately determine the risks from thermal hazards due to large LNG fires. The LNG cascading failure analysis will investigate the possibility of cascading

(multi-tank) failure of an LNG vessel due to cryogenic and thermal damage and the consequences of such a failure on an LNG vessels' structural integrity. Sandia National Laboratory, Albuquerque, New Mexico, will conduct the research at their large scale experimental test site. While the anticipated completion date for this research is December 2009, the Department intends to provide a report on the status of its efforts by December 1, 2008.

CCPI. The Department plans to comply with the Committee's request for the next CCPI solicitation to provide more focus for demonstration of carbon capture, transport and storage technologies.

FutureGen. While the Department remains committed to the goals of FutureGen, several factors have caused the Department to totally restructure the original FutureGen project. Factors contributing to this decision include projected rising construction costs of FutureGen as originally structured, changes in the electricity market, and a growing near-term interest in the promulgation of carbon dioxide ($CO_2$) regulations, as evidenced by the policies of several states such as Florida, Kansas, Minnesota and California, which have recently conditioned the issuance of a permit for power plant construction on either no carbon content, the use of carbon capture and storage (CCS) technology or the flexibility to add CCS.

As a consequence of these factors, DOE has determined that it is necessary to adopt a new strategic approach. This new approach emphasizes early commercial experience with near-zero emission coal plants [Integrated Gasification Combined Cycle Technology (IGCC) with CCS] through a series of demonstrations linked to the commercial operations of IGCC. This newly structured FutureGen would limit DOE's cost exposure against potential cost-growth of FutureGen.

Under this new FutureGen approach, DOE proposes to accelerate the deployment of IGCC commercial power plants equipped with CCS technology. While there are remaining concerns about capital cost for IGCC without CCS, the remaining risks are at a level that the industry commonly accepts in making investment decisions on such projects. The major barrier to commercial scale deployment of near-zero emissions coal-fueled power production, which is also the thrust of this new approach, is the need for further development and acceptance of CCS technology. All of the actions taken are in line with the guidance provided in the House Report language.

Fuels and Power Systems. The Committee requests the Department to focus R&D efforts on $CO_2$ capture technology for existing PC combustion plants, to include efforts on high-strength materials for heat intensive operations, plant efficiency and oxy-fuel combustion PC retrofit technology. In FY 2008, the Department's High Performance Materials Program will continue its focus on developing high temperature alloys and components for use higher efficiency advanced PC combustion plants as well as in advanced combined cycle systems. In addition the Department's activities in support of the Committee's request are being conducted via the Innovations for Existing Plants (IEP) program. In FY 2008, the Department did not request funding for IEP because the Government's role in developing mercury removal technologies had shifted to the private sector with the implementation of the Clean Air Interstate Rule and the Clean Air Mercury Rule, which were promulgated in 2005. Nonetheless, in FY 2008, the $36,081,000 appropriated will be used to initiate the research refocused on $CO_2$ capture from existing plants. In FY 2008 and FY 2009, the IEP program will be refocused to develop advanced technologies economically and effectively to reduce $CO_2$ emissions from existing coal

fired power plants. Retrofitting $CO_2$ capture technologies onto existing utility boilers offers the potential to greatly reduce greenhouse gas emissions from the existing coal fleet. Industry currently does little to address the development of such technologies. This program will conduct research directed at developing technology for the capture, separation, and compression of $CO_2$ from existing coal fired utility boilers. In addition, large scale field testing of promising technologies in the areas of capture, oxy-combustion, and compression may be initiated.

With respect to Fuels and Power Systems, the Committee also requests that the Department undertake large scale (i.e., one million tons per year injection) carbon sequestration experimental projects in reservoirs that are instrumented, monitored and analyzed to verify the practical reliability and implementation of sequestration. The Department is responding to this request. However, geographical differences in fossil fuel use and potential sequestration storage sites across the United States (U.S.) have dictated the adoption of a regional approach in addressing $CO_2$ sequestration. DOE has created a network of seven Regional Carbon Sequestration Partnerships (RCSPs) to develop the technology and infrastructure necessary to promote the commercialization of carbon sequestration technologies throughout the U.S. and Canada. Approximately 400 organizations are part of the seven RCSPs. Collectively, the seven RCSPs represent regions encompassing 97 percent of coal-fired $CO_2$ emissions, 97 percent of industrial $CO_2$ emissions, 96 percent of the total land mass, and essentially all the geologic sequestration sites in the U.S. potentially available for carbon storage. DOE has awarded four large-scale sequestration projects to date and is currently in negotiations with the remaining three RCSPs for award of a large-scale test.

In addition to the above reports from the Senate and House Committees, the House Committee on Appropriations issued a report on December 17, 2007 containing one additional request regarding the Consolidate Appropriations Act, 2008, not included in the reports discussed above. The House Committee requested that should FutureGen continue to maintain significant balances of unused funds or the project not continue, the Department should submit a report to both Appropriations Committees for approval to reprogram the balances for other coal research and development activities. In light of the restructuring of the FutureGen program described above, the Department does not anticipate that it will maintain significant balances of unused funds. To the extent such balances are maintained, the Department will submit a report, as requested by the House Committee.

Under Strategic Petroleum Reserve Expansion, the Department is directed to use $25,000,000 to acquire land at a new site consistent with the budget request.

In accordance with the direction, the Department is performing geotechnical seismic research on the salt domes in the Richton, Mississippi site as well as performing engineering design and permit application and acquisition of real estate for the proposed new site. Since additional funding may be needed to actually complete the purchase of the site, all work being done is in anticipation of actually completing the purchase of the site.

Under Naval Petroleum Reserves, oil shale production, within available funds, $1,441,000 is directed for the Naval Petroleum Reserve #3 and $2,000,000 for Los Alamos National Laboratory (LANL) to support in basin scale environmental impacts for oil shale production.

The Department has provided LANL with funding to conduct basin scale environmental impacts for oil shale production.

Mr. HOBSON. Mr. Karsner, one of the specific directions given to your office was to take all remaining funding from the National Academy of Science phase III study on prospective benefits of DOE's applied energy R&D programs and use those remaining funds for the global energy assessment. How much funding remained from the phase III study as of the date of enactment of the 2008 Omnibus, and what is the status of transferring those funds to global energy assessment?

Mr. KARSNER. I apologize, sir. I don't have those facts on hand, but I will pursue them and report back to you for the record and brief you as well, if you would like.

GLOBAL ENERGY ASSESSMENT

Currently, $497,000 remains from the Phase 3 study. EERE and EIA are working toward placing a task order with the Global Energy Assessment (GEA) Council through the Department's existing contract for services with the National Academies. The contract action requires a mutually agreed upon workplan from GEA, which must include specific goals, deliverables, schedules, and milestones to ensure effective and legal use of the taxpayer dollars. Members of my staff met with GEA Council Representatives in October 2007 and March 2008 to move this project forward.

Mr. HOBSON. I believe you will find that your office has not complied extremely well with this.

For the EERE and OE and FE programs, please provide this subcommittee a detailed report documenting the execution status for all the earmarked projects contained in the explanatory statement accompanying the Consolidated Appropriations Act of fiscal year 2008. Because Under Secretary Albright is also responsible for the Office of Nuclear Energy, I would like him to make sure that we have the execution report for all nuclear energy earmarks as well. If you have not provided funding yet, identify the contacts made to date and when you anticipate providing the funding to the recipients.

Now, this isn't a typical question for the record where your response is run through multiple layers at DOE headquarters, and at the infamous—I don't know what to call it—OMB dark energy, black box where things get in there and they never come back. It takes months to get back. I think those status reports on the 2008 earmarks could be delivered back to us not later than 1 week from today, because I don't think that is a very difficult thing to do.

It is only a status report. OMB doesn't have to make decisions on what is a status or not a status, and DOE doesn't either. It is either there, done, or not done. So I would hope the chairman would encourage, and we would encourage all of you to be—if we have problems, this is a way that we can begin to fix them, and figure out where we all are. Do we all understand where we are? Does anybody have any problems?

Mr. ALBRIGHT. No, sir. And let me volunteer to take the lead to make sure that we can get you the information that we have.

Mr. HOBSON. I would like to suggest that I will recommend to the chairman that this will not be the last hearing if we don't get this stuff. You may be back again, which I am not sure you guys want to do. But this is important to the committee and the committee's work, so I hope people will respond accordingly.

Thank you, Mr. Chairman.

[Insert for the record]

U.S. DOE

## Congressionally Directed Projects Tracking Report

### Energy Efficiency and Renewable Energy as of 13 March 2008

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| University of Arizona Photovoltaic Concentrator Development (AZ) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | $984,000 |
| San Francisco MUNI Solar Energy Facility (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 610,080 |
| Photovoltaic Demonstration Project (CT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Conductive, Transparent Coatings Solar Cell Research Project (MA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 1,968,000 |
| Clean Power Energy Research Consortium - Nicholls State University | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| University of Nebraska, CIBS Solar Cell Development (NE) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 934,800 |
| High Efficiency Cascade Solar Cells (NM) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Sandia National Lab Concentrating Solar (NM): | To be handled via Field Work Proposal | 2,952,000 |
| University of Nevada, Las Vegas, Solar Cell Nanotechnology (NV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| Solar Consortium of New York Photovoltaic Research and Development Center (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Kotzebue Electric Wind Power System (AK) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 147,600 |
| Cloud County Community College Wind Turbine (KS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Wyandotte Green Windpower on Brownfields Project (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Coastal Wind Ohio (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 590,400 |
| Wind Spires as an Alternative Energy Source (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 1,082,400 |
| Wave Power Demonstration Project at Reedsport, Oregon | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| Northwest Regional Planning Commission, Manufacturing Conversion for Energy Efficiency (WI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 4,920,000 |
| Great Plains Wind Power Test Facility (TX) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| Notre Dame Geothermal Ionic Liquids Research (IN) | Initial letter sent to recipient<br>awaiting one page summary recipient | 984,000 |
| Alternative Energy Geothermal Technology Demonstration Program | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 295,500 |
| Oregon Institute of Technology Geo-Heat Center (OR) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Renewable Energy Biomass Utilization Program (AK) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 492,000 |
| Southeast Bioenergy Initiative (AL) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Ethanol from Agriculture for Arkansas and America | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Placer County Biomass Utilization Pilot Project (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Costilla County Economic Development Council, Inc., Biodiesel Project (CO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 270,600 |
| Jefferson County Bioenergy Initiative Plant (CO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Sorghum to Ethanol Research (CO) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 984,000 |
| Connecticut Biodiesel Power Generator (CT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| DBS Energy Inc., Glastonbury, CT Biofuels Technology Project in Suffield (CT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Stamford Waste-to-Energy Project (CT) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 1,476,000 |
| Integrated Corn Cellulose Biorefinery: Next Generation Chemicals Platform | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Alternative Biofuel Infrastructure in Central Georgia (GA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 344,400 |
| Consortium for Plant Biotechnology Research (GA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 3,936,000 |
| MidSouth/Southeast Bioenergy Consortium (GA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| University of Hawaii, College of Tropical Agriculture and Human Resources, Development of High Yield Tropical Feedstock (HI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| University of Northern Iowa, National Agriculture-Based Industrial Lubricants (IO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| A National Model for Water Quality Improvement and Renewable Energy Production | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Southern Illinois University, Carbondale, Biofuels Research (IL) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 492,000 |
| Bioenergy Cooperative Ethanol Biomass Fuel Plant | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Waste-to-Energy Cogeneration Project (IN) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| University of Kentucky Biofuels Research Laboratory (KY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| U. of Florida, Gainesville, With the Earth University Foundation Biofuel Project | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Raceland Raw Sugar Corporation, Bio-Renewable Ethanol and Co-Generation Plant, Biomass (LA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| U. of Maryland Energy Research Center (MD) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 742,000 |
| Intermediary Biochemical's (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 246,000 |
| MBI International Biomass Research (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Sustainable Energy Center Biodiesel from Algae (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Koochiching County, Renewable Energy Clean Air Project (RECAP), Plasma Gasification Waste-to-Energy Project (MN) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 393,600 |
| Strategic Biomass Initiative (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Appalachian State University Biofuels and Biomass Research Initiative | Initial letter sent to recipient<br>awaiting one page summary from recipient | 295,200 |
| Integrated Biomass Refining Institute at North Carolina State University (NC) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 984,000 |
| University of North Dakota, Grand Forks, Center for Biomass Utilization | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| University of Nebraska, Lincoln, Bioenergy Demonstration Project: Value-Added Products from Renewable Fuels (NE) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| Trenton Fuel Works Biofuels Plant Re-Construction (NJ) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Auburn Regional Bioenergy Enterprise (NY) | one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Closed Loop Short Rotation Woody biomass (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Chautauqua County - Methane Gas Utilization Project from Landfill at Ellery (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Mill Seat Landfill Bioreactor Renewable Green Power (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| SUNY Cobleskill Bio-Waste to Bio-Energy Project (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,279,200 |
| Woody Biomass Project at SUNY-ESF (NY) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 738,000 |
| Bipolar Wafer Cell NIMH Ion Battery (CT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| University of Oklahoma Biofuels Refining (OK) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| Port of Umatilla Biodiesel Refining Plant (OR) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Biodiesel Injection Blending Facilities: Awaiting recipient contact info. | working with staff to determine the identity of the recipient organization | 738,000 |
| Umass Renewable Energy Economy Expansion Project | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 196,800 |
| Messiah College Biodiesel Fuel Generation Project (PA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Foster-Glocester Regional School District, Ponaganet Alternative Energy Lab and Biomass Facilities Project (RI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Research and Technology Development for Genetic Improvement of Switchgrass | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| BioEthanol Collaborative (SC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Biofuel Production Initiative Claflin (SC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| South Dakota State University, Sun Grant Initiative, Regional Biomass Feedstock Development Partnership (SD) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 3,936,000 |
| Advancing Texas Biofuel Production | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Biofuels Development at Texas A&M (TX) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 984,000 |
| Northeast Texas Community College Biodiesel (TX) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Vermont Biomass Energy Resources Center (VT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Renewable Energy from Animal Biomass | Initial letter sent to recipient<br>awaiting one page summary from recipient | 492,000 |
| Vermont Sustainable Jobs Fund, Montpelier, Central Vermont Recovered Biomass Facility (VT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Nanostructural Materials for Safe Alternative Energy (NC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| King County Biogas and Nutrient Reduction Project (WA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Pierce County, Landfill Gas-to-Clean Fuel Project, Biomass (WA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 3,739,200 |
| Biorefining for Energy Security at Ohio University (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Chariton Valley R.C.&D., Chariton Valley Biomass for Rural Development | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Alternative Fuel Source Study-An Energy Efficient and Environmentally-Friendly Approach | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Energy Efficient Press & Sinter of Titanium Powder | Initial letter sent to recipient<br>awaiting one page summary from recipient | 492,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Kansas City Area Transportation Authority, Demonstration of Plug-In Vehicles, (KS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Cooling, Heating, and Power (CHP) at MSU (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 1,968,000 |
| Lightweight Automotive Materials for Increased Fuel Efficiency (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 1,968,000 |
| Center for Advanced Vehicular Systems (CAVS) at MSU (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 3,936,000 |
| Hybrid Hydraulic Drivetrain Demonstration (OH) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 1,968,000 |
| Clean and Efficient Diesel Locomotive (PA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Juniata Ultra Low Emission Locomotive Demonstrator (PA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 590,400 |
| Lightweight Composite Material for Heavy Duty Vehicles (WV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Transportable Emissions Testing Laboratory for Alternative Vehicles Emissions Testing (WV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Tanadgusix Foundation Hydrogen Project (AK) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 246,000 |
| Nano-structured Fuel Cell Membrane Electrode Assembly (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 984,000 |
| Safe Detector Systems for Hydrogen Leaks (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Solid Acid Fuel Cell Research (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Renewable & Logistic Fuels for Fuel Cells at the Colorado School of Mines (CO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Purdue Hydrogen Technologies Program (IN) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Silicon Based Solid Oxide Fuel Cell Chip for Portable Consumer Electronics (MA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| University of Nevada, Las Vegas, National Center on Energy Management (NV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Michigan Tech Nanostructured Materials (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,230,000 |
| Modular Energy Storage System for Fuel Cells | one page summary received from recipient<br>cost share determination letter in process<br>awaiting receipt of application from the recipient | 1,180,800 |
| Alternate Fuel Cell Membranes for Energy Independence at USM (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Martin County Fuel Cell Development (NC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| NaSi and Na-SG Powder Hydrogen Fuel Cells (NJ) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| One Kilowatt Biogas Fueled Solid Oxide Fuel Cell Stack (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| RIT Integrated Power Microsystems (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Fuel Cells for High Altitude Airship (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 787,200 |
| Hydrogen Energy Production and Storage Phase IV (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Solid Oxide Fuel Cell Systems Development (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| University of Akron Carbon Based Fuel Cell (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 1,180,800 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| CU-ICAR Hydrogen Infrastructure (SC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 836,400 |
| Hydrogen Fuel Cell Development in Columbia (SC) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 1,476,000 |
| Texas Hydrogen Highway (TX) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 382,776 |
| University of North Alabama Green Campus Initiative (AL) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Jackson Park Hospital Green Building Medical Center | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Sustainable Buildings Project at the University of Louisville (KY) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 393,600 |
| Sustainable LED Fluorescent Light Replacement Technology (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 590,400 |
| Advanced Green Design for Museum of Natural History | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 787,200 |
| Affordable, Energy Efficient, Self Help Housing (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 295,200 |
| Building Materials Reclamation Program (NC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Green Roof Project Southwest Brooklyn (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 246,000 |
| University of Nevada, Las Vegas, Lighting Emitting Diode Display Engineering (NV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 590,400 |
| First Responder "Green" House (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 98,400 |
| Green Visitor Center, Brooklyn Botanic Garden (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 590,400 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Greenfield Community College - Sustainable Energy Model | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 393,600 |
| NYIT Building Efficiency Demonstration Project (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Building-Integrated Photovoltaic Solar Energy System (PA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 295,200 |
| Texas A&M Green Campus Research Initiative (TX) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Center for Energy Efficient Design (VA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 196,800 |
| Vermont Independent Colleges Zero-Energy Campaign (VT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| NCCR "Green" Building | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| Council of Energy Resource Tribes, (CO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| White Earth Tribal Nation Wind Energy (MN) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 984,000 |
| Navaho Hopi Land Commission Renewable Development (NM) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 295,200 |
| City of Chula Vista, Alternative Fuels Pilot Project (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| Wisdom Way Solar Village | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 393,600 |
| Compact Membrane Systems, Inc. - Applied Membrane Technology for Processing Ethanol for Biomass (DE) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| Florida Renewable Energy Program (FL) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Miami Museum of Science Renewable Energy Project (FL) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| University of Georgia Biorefinery and Fuel Cell Research (GA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 1,230,000 |
| Hawaii Distributed Energy Resource Technologies for Energy Security | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,968,000 |
| Pacific International Center for High Technology Research, Renewable Energy Development Venture (HI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,230,000 |
| Tools for Nanotechnology Education (OR) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Illinois Intitute of Technology | one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 246,000 |
| Wichita State University Sustainable Energy Solutions (KS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Kentucky Rural Energy Supply Program | Initial letter sent to recipient<br>awaiting one page summary from recipient | 1,968,000 |
| Louisiana State University Alternative Energy Research (LA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Sustainable Energy Research Facility Construction (MD) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 738,000 |
| Great Lakes Energy Research Park (MI) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 492,000 |
| Center for Producer-Owned Energy (MN) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Laurentian Energy Authority (MN) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Minnesota Center for Renewable Energy (MN) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 492,000 |
| MARET Center (MO) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Sustainable Energy Research Center at MSU (MS) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 10,824,000 |
| Western North Carolina Clean Energy Business Incubator (NC) | working with staff to determine the identity of the recipient organization | 354,240 |
| North Dakota State University, Center for Nanoscale Energy | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 5,904,000 |
| Nevada Institute for Renewable Energy Commercialization, (NV) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,476,000 |
| Green Energy, Arts & Education Center (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>application received from recipient | 492,000 |
| Nye County Renewable Energy Feasibility Study (NY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| SUNY-Oswego Energy Independence | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 295,200 |
| Truckee Meadow Water Reclamation Facility (NV) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 984,000 |
| Alternative Energy Workforce Applications Training Program | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 818,688 |
| HydroPartners in Brazil (OH) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| Risk-Based Data Management System | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 492,000 |
| York College National Energy Resource Center (SC) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 196,800 |
| Center for Renewable Energy, Science, and Technology (TX) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Renewable Energy for Rural Economic Development Program (UT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Casper College Renewable Energy Program (WY) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 295,200 |
| Technology Export Program to Export U.S. clean Energy Technologies (CETE): | Funded Directly from DOE HQ | 590,400 |
| Driftless Area Initiative (IL, IA, MN, WI) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 608,112 |
| Nanostructured Solar Cells (AR) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 1,180,800 |
| Plug-in Hybrid Electric Vehicle Demonstration (CA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| Snohomish County, Biodiesel Project (WA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 344,400 |
| Iowa Central Community College Renewable Fuels Testing Lab (IA) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| High Energy Batteries for Hybrid Buses (IN) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter is in process | 984,000 |
| The Greenville Steam Efficiency Project (ME) | Initial letter sent to recipient<br>awaiting one page summary from recipient | 885,600 |
| Advanced Hybrid Vehicle Technology, Hybrid Electric Vehicle Group | Initial letter sent to recipient<br>awaiting one page summary from recipient | 393,600 |
| Vermont Biofuels Initiative (VT) | Initial letter sent to recipient<br>one page summary received from recipient<br>cost share determination letter sent to recipient<br>awaiting receipt of application from the recipient | 984,000 |
| **Nuclear Energy** | | |
| CVD Single-Crystal Diamond Optical Switch | The Department is in the process of meeting with Optelecom-NKF to develop a scope of work that supports our Gen IV / nuclear energy needs. Funding will be provided once the scope of work and method of payment has been determined. | 984,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Technologies Ventures Corporation | The Department has drafted the scope of work and provided it to the Technologies Ventures Corporation (TVC). TVC has provided the Department with a proposal and it is currently under review. While the review process is being completed, the Department plans to provide partial funding in the amount of $1,000,000 to TVC in early April. The remaining funds will be provided to TVC in May. | 2,952,000 |
| Russian Gas Reactor Work | The Office of Nuclear Energy is in the process of reviewing the current NNSA / Russia Federation gas reactor scope of work to identify those activities with applicability to the Generation IV Very High Temperature Reactor (VHTR) and the Next Generation Nuclear Plant (NGNP) concepts. NE has identified a number of activities in support of the VHTR and NGNP and will provide $7,000,000 in April to the NNSA, who will continue to manage the program under their existing protocol. Additional activities will be identified and funded in conjunction with the finalization of the NNSA/ Russian Federation FY 2008 scope of work. | 8,601,000 |
| Deep Burn characteristics of gas-cooled reactors | The Department has developed the scope of work and will issue an open solicitation for the national laboratories and universities by the end of April. The plan is to have multiple awards and issue the funds as soon as the awards are made. | 6,698,000 |
| Oak Ridge national Lab. Hot Cell | Funding in the amount of $14,864K will be provided to ORNL in March to ORNL. The funding will provide facility and equipment upgrades and modifications to permit research and development related to aqueous head-end processing, aqueous separations, conversion of various product liquid solutions to solids, and the development of waste forms in support of development of GNEP technologies. | 14,864,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Los Alamos National Lab. Hot Cell | Funding in the amount of $7,927K will be provided in March to LANL. The funding will focus on upgrades on the west bank of eight hot cells. Planned work will provide significant upgrades to the facility and to permit research and development activities related to remote fuel fabrication, safeguards measurements, and reactor core materials testing.<br><br>Funding in the amount of $6,937K will be provided in March to LANL. The scope of work includes preparing project management documentation, refurbishment of the south hot cell, re-painting the interior surfaces to facilitate future decontamination and allowing unrestricted access into the hot cell, refurbishing the remote manipulators, pulling back utilities (electrical, compressed air, house water) in Area A to the exterior walls, providing flatbed truck access to Area A, removing experimental equipment to permit new equipment to be installed e.g., target delay line fencing, magnet power supplies, beamline, shield blocks around the beamline, and other shielding and activated material.. | 14,864,000 |
| | | |
| **Office of Electricity Delivery and Energy Reliability** | | |
| Alabama Power Project, Integrated Distribution Management System (AL) | Initial letter has been sent from NETL procurement requesting a one-page summary of the proposed project.<br>One-page project summary has NOT yet been received. | 1,968,000 |
| National Center for Reliable Electric Power Transmission (AR) | Initial letter has been sent from NETL procurement.<br>One-page project summary has been received.<br>Funding received at NETL.<br>Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 492,000 |
| Dine' Power Authority (AZ) | Initial letter has been sent from NETL procurement.<br>One-page project summary has been received. | 492,000 |
| Navajo Tribal Utility Authority, Fort Defiance (AZ) | Initial letter has been sent from NETL procurement.<br>One-page project summary has been received.<br>Funding received at NETL. | 1,968,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Utility Integration of Distribution Generation (CA) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding received at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 590,400 |
| Connecticut Energy Savings Technology Project (CT) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Second letter will be sent from NETL procurement on March 17, 2008, indicating 50% required cost share and requesting receipt of full application within 30 days. | 738,000 |
| Vehicle to Grid Demonstration Project (DE) | Initial letter has been sent from NETL procurement. One-page project summary has been received. | 738,000 |
| Florida State University Electric Grid System Study (FL) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding received at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 984,000 |
| Wauchula Municipal Electric Substation Rehab (FL) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding received at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 50% required cost share and requesting receipt of full application within 30 days. | 984,000 |
| Pilot Energy Cost Control Evaluation (WV, PA, & IN) | Initial letter has been sent from NETL procurement. One-page project summary has been received. | 1,476,000 |
| Willimar Municipal Utilities Power Generation Study (MN) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding recieved at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 295,200 |
| New Albany Electrical Substation (MS) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding received at NETL. | 885,600 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Bismarck State College, Center of Excellence (ND) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Second letter will be sent from NETL procurement on March 17, 2008, indicating 50% required cost share and requesting receipt of full application within 30 days. BSC has inquired about permission to incur pre-award costs. | 5,116,308 |
| Energy Surety Research Center at New Mexico Tech University (NM) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding recieved at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 1,968,000 |
| Electric Transmission Line Improvements (NY) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding received at NETL. | 1,476,000 |
| Rolls-Royce Fuel Cell Systems (US), Inc. Stark State College of Technology, Fuel Cell Prototyping Center, Canton, OH, Solid Oxide Fuel Cell (OH) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Funding recieved at NETL. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 492,000 |
| Electric Utility Transmission Program (WA) | Initial letter has been sent from NETL procurement. One-page project summary has been received. Second letter will be sent from NETL procurement on March 17, 2008, indicating 20% required cost share and requesting receipt of full application within 30 days. | 787,200 |
| Chenega Bay Generator Replacement (AK) | INL project officer to contact recipient. Project officer has managed earmark projects with this recipient in the past. | 379,332 |
| Iowa Stored Energy Plant (IA) | Verbal discussions begun on SOW. Funds obligated by HQ in March AFP but not yet received by Sandia as of 3/12/08. | 1,476,000 |
| University of Missouri-Rolla Distributed Energy Research Center (MO) | Verbal discussions begun on SOW. Funds obligated by HQ in March AFP but not received by Sandia as of 3/12/08. | 492,000 |
| High Voltage Transmission Lines Phase II (TN) | ORNL project officer defining work scope with recipient. Potential for project award in May if funds are available in April. | 492,000 |
| | | |
| **Fossil Energy Research and Development** | | |
| Arctic Energy Office (AK) | For all the FE Congressionally Directed Projects. | 6,680,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Arrowhead Center at New Mexico State University to Promote Prosperity and Public Welfare in New Mexico Through Economic Development (NM) | The Determination of Noncompetitive Financial Assistance (DNFA) was approved on 3-13-2008. The week of 3-17-2008 the procurement staff of the National Energy Technology Laboratory along with the assigned Technical Project Manager will be contacting the recipients to discuss the preparation and submission of a formal application (i.e., consisting of an application form; Statement of Project Objectives; detailed budget; and various assurances). The timing and negotiation of the awards will be based upon when the recipients respond with the necessary requirements to NETL. Awards are currently planned for the May – July timeframe. All projects are in compliance with the EPACT 2005 sec. 988 requiring 20% cost sharing. | 944,940 |
| Carbon Sequestration Study (OH) | " | 944,940 |
| Center for Advanced Separation Technologies (VA) | " | 944,940 |
| Center for Instrumented Critical Infrastructures (PA) | " | 954,000 |
| Center for Zero Emissions Research and Technology (MT) | " | 5,668,665 |
| Coal Fuels Alliance (KY) | " | 1,370,065 |
| Colorado School of Mines, Golden Co, Colorado Center for Sustainable Energy at the Colorado School of Mines (CO) | " | 944,940 |
| Direct Carbon Fuel Cell Prototype (CA) | " | 708,219 |
| Eastern Illinois University Power Plant (IL) | " | 472,470 |
| Fuel Research and Development at Northern Illinois University (IL) | " | 944,940 |
| Gulf of Mexico Hydrates Research Consortium at the University of Miss (MS) | " | 954,000 |

| Project Name | Status | FY 2008 Federal Share after Rescission / Reductions |
|---|---|---|
| Interdisciplinary Clean Energy Program at the University of Utah (UT) | " | 3,306,316 |
| ITM Reaction-Driven Ceramic Membrane Systems (PA) | " | 944,940 |
| Membrane Technology for Produced Water at Lea County (NM) | " | 1,432,000 |
| NE Ohio Carbon Sequestration Pipeline Scoping Study (OH) | " | 944,940 |
| North Dakota Energy and Environment Research Center, Grand Forks, Fossil Fuel Cooperative Research and Development (ND) | " | 3,778,786 |
| North Dakota Energy and Environment Research Center, Grand Forks, National Center for Hydrogen Technology (ND) | " | 2,833,847 |
| Ohio River Clean Fuels CO2 Production and Emissions Study (OH) | " | 235,749 |
| Penn State University Solid Oxide Fuel Cells (PA) | " | 3,778,786 |
| RamGen, Bellevue, WA, CO2 Compression Initiative Utilizing Shockwave/Ramjet Compression Technology (WA) | " | 1,133,344 |
| Shallow Carbon Sequestration Pilot Demonstration (MO) | " | 2,362,349 |
| Stripper Well Consortium (PA) | " | 1,432,000 |
| The Gulf Petro Initiative (LA) | " | 715,000 |
| University of Wyoming – Carbon Sequestration Monitoring Activities (WY) | " | 1,558,470 |
| West Virginia University, Advanced Coal Tech (Liquefaction) in China (WV) | " | 330,437 |

Thank you all.

Mr. VISCLOSKY. Thank you, Mr. Hobson.

Mr. Israel.

Mr. ISRAEL. Thank you, Mr. Chairman.

MANUFACTURING TECHNOLOGY RESEARCH AND DEVELOPMENT

Mr. Karsner, I want to ask you some questions about better manufacturing technology research and development. Mr. Hobson began in his opening statement by talking about some energy problems we have in Afghanistan that have military implications. There is another military implication we have to our own lack of coherence on energy policy, and that is that we have Striker combat vehicles on the ground in Afghanistan and Iraq that get five to seven miles per gallon, because we haven't advanced battery technologies and automotives technologies to the point where we can actually have military tactical vehicles in-theater that don't rely on our adversaries to sell us the fuel to propel those vehicles.

At our hearing a few weeks ago, we heard from the director of transportation at Argonne National Laboratory. He suggested that we should think about making a very significant investment in battery manufacturing. He said that we are supreme in battery materials and chemistry, but we lack manufacturing and prototype capabilities.

He also said that we haven't accomplished much if we are going to transfer our dependence on imported oil for an addiction to foreign batteries, because many other countries in the world have made quantum leaps on battery manufacturing research, development and prototype and manufacturing.

So two questions. One is, why is there such a reluctance by U.S. companies to commit to U.S. domestic manufacturing of lithium ion batteries? That is number one. And number two, what can your office in DOE do to promote domestic manufacturing of advanced batteries?

Mr. KARSNER. Thank you, congressman. Let me say for the record that I agree in the entirety with the remarks of the gentleman from Argonne National Laboratory in that respect. The principal vehicle for commercialization that Congress has given us that is meant to be a very powerful tool going forward, cross-cutting the entire portfolio, is the Energy Policy Act Title 17 loan guarantee program, of which manufacturing facilities for commercialization of technologies like battery storage should be able to avail themselves.

So that is to say, offering debt instrument guarantees up to 80 percent of a new project cost should help attract manufacturing in this sector to our shores. That statement could be true of anything, of solar panels, of wind turbines, or water heaters, but certainly of the high priority, as you heard from Assistant Secretary Kolevar, of the need for storage technologies, either in transportation or in generation.

If we view these things as a strategic commodity in the way that we viewed integrated circuits and microchips in the 1990s, we will be able to salvage this industry for the United States. But it is unfortunately the case today that we do the heavy lifting of the advanced research and development, and these things get deployed,

but they don't get deployed domestically. They get deployed among our competitors, and then we have intermittent tax policy to re-import them.

Your question specifically is what could we do better to cultivate a better investment environment.

Mr. ISRAEL. Because the loan guarantee program doesn't appear to be working.

Mr. KARSNER. It is in the process of being stood up.

Mr. ISRAEL. Okay.

Mr. KARSNER. But when it manifests, it should serve that purpose.

But number one, it won't be the loan guarantees alone that are sufficient. You will need a predictable policy environment and a predictable marketplace. That means that the battery suppliers are looking for reliable off-take purchasers of their products, and they are finding that either through government assistance or through industry, even in France, let alone in China, India, Japan, Korea and the other places where the industry is thriving.

So we are trying to work closely with the vehicle manufacturers here who have their own balance sheet difficulties and challenges right now, to offer some assurance to battery sub-suppliers. To that end, we are making new relationships with the battery sub-suppliers, the Advanced Battery Consortium, to integrate them more closely into FreedomCAR for exactly that purpose.

LOAN GUARANTEE PROGRAM

Mr. ISRAEL. When will the loan guarantee program actually be stood up?

Mr. KARSNER. Of course, the loan guarantee program is not managed in my office.

Mr. ISRAEL. Where is it managed?

Mr. KARSNER. But all of us contribute to what we believe would be the appropriate available technologies to——

Mr. ISRAEL. So forgive my ignorance, but maybe Secretary Albright can answer. Who has responsibility, where is the accountability for the loan guarantee program? Who is standing it up and when is it going to be stood up?

Mr. ALBRIGHT. It is in the process of being stood up. Currently, the initial solicitation received over 100 requests for loans. We have narrowed it down to 16 possible loans and are in the process of winnowing those to determine which will receive the loan guarantees. We are also in the process of hiring a very capable and competent staff, with extensive background in finance. We have not finalized the schedule, but we are working on the schedule for announcing solicitations throughout this year.

Mr. ISRAEL. Can you provide the subcommittee with a more precise timetable? Give us a little more precise sense of when we can expect to go from being stood up to stood up?

TIMELINE FOR THE LOAN GUARANTEE PROGRAM OFFICE

With respect to the Loan Guarantee Program Office (LGPO), significant progress has been made over this past year. A year ago this week, two very experienced individuals were detailed from the U.S. Treasury Department to help lead the effort of evaluating a total of 143 pre-applicants seeking an invitation to submit full applications for loan guarantees. The 143 pre-applicants resulted from the initial solicita-

tion of the program which officially closed on December 31, 2006. Supported by contractors over the course of last summer, the pre-applicants underwent a rigorous technical and financial review in accordance with criteria set forth from the LGPO Credit Review Board (CRB), the governing board of the program. On August 3, 2007, David G. Frantz was named to serve as the Director of the Department of Energy's (DOE) Loan Guarantee program. Mr. Frantz reports directly to DOE's Chief Financial Officer.

The final regulations for the Loan Guarantee Program were issued on October 4, 2007 along with the selection of 16 pre-applicants from the first solicitation in 2006 to be invited to submit a full application. Since then, a remarkable amount of work has been accomplished. The staff has grown from one permanent employee to nine permanent employees, including investment officers with 10 to 20 years of worldwide project financing experience, predominantly in the heavy infrastructure, utility, and energy sectors as well as significant experience working in the U.S. government in conformity with the requirements of the Federal Credit Reform Act of 1990 (FCRA). The LGPO has also recruited additional highly qualified staff, is in the process of finalizing a credit subsidy model, as required by FCRA, and has instituted comprehensive policies and procedures to initiate the application and due diligence process. The LGPO is in the process of preparing to receive its first applications from the 16 selectees in early April 2008. The LGPO is also working with the Office of Finance and Accounting and the Office of Corporate Information Systems to develop accounting and processing systems that will allow the office to monitor and manage the loans for which guarantees are issued over the life of the projects. Although no due date has been set for application submission, in the next few weeks, the LGPO expects to receive its first application submission from one of the 16 pre-applicants and to begin the due diligence necessary to assess the technical and financial soundness of the project in order to issue a loan guarantee. Simultaneously, the office is moving forward with its next solicitation by preparing a draft solicitation implementation plan to be submitted to Congress sometime during the month of April.

Mr. ALBRIGHT. I can. As soon as we have something more definitive from the board, I will be happy to give you that. I don't want to misstate when we will announce, but I can——

Mr. ISRAEL. Something more final from the board?

Mr. ALBRIGHT. Yes, we have a board of directors that manages the loan guarantee program. We are currently trying to determine when we realistically can put solicitations out and in what areas. That has not been finalized.

VEHICLE TECHNOLOGY

Mr. ISRAEL. Okay. My understanding is that Toyota actually has Panasonic making their batteries. Have you heard that? Is that accurate?

Mr. KARSNER. That is correct. I will be visiting, in fact, those companies this week in Japan. I am hoping to get greater collaboration. We generally have been siloed in our competitive posture with the Japanese for almost 20 years. Together, the two countries are about 80 percent of global energy R&D, so we are looking to see if we can have a more collaborative relationship.

Mr. ISRAEL. Just one final question, if I have the time.

Mr. VISCLOSKY. Before you do, I just want to follow up on that. It just seems as though this is a broken record. We had an oversight hearing a year ago about energy policy. It was noted that a lot of the investment that taxpayers have made through the Department of Energy on vehicle technology were used by domestic auto companies to put more horsepower in the cars, but not more mileage. And now that Toyota, who apparently has their own battery supply, is as large as GM, and GM is under financial duress.

What assurance do we have—you know, before it was high performance versus mileage. Now, the Japanese figured out, hey, you have to have a battery supply; we are looking around and we are looking at a federal loan program. What assurance do we have that the monies Congress is going to appropriate to you, that the auto companies are going to use for their intended purpose and use them wisely? It just seems like for a generation, it is just a broken record.

Mr. ISRAEL. Mr. Chairman, that was my last question.

Mr. VISCLOSKY. Oh, I am sorry. [Laughter.]

Mr. KARSNER. It is probably better suited to either the CEOs or a specialist at business schools, but you can't ultimately protect business leaders from themselves. Some will win and some will fail.

Mr. VISCLOSKY. But the taxpayers—why spend the money if they are not going to use it?

Mr. KARSNER. I am hopeful that the new Energy Independence and Security Act and the movement of the CAFE standards for the first time since CAFE was implemented will force that discussion out and deliver the technologies more readily, because frankly it is a compliance issue at this juncture.

Mr. VISCLOSKY. I apologize. I thought you were moving on.

Mr. ISRAEL. Thank you for asking——

Mr. VISCLOSKY. Okay.

Mr. Wamp.

ENERGY EFFICIENCY

Mr. WAMP. Thank you, Mr. Chairman.

We get into a lot of process discussions here, and I want to kind of leap out of even the budget request and talk on a more macro level. Last week throughout the Tennessee Valley Authority region, TVA's board rightly held a series of hearings on ways that consumers can reduce their cost on energy. I would like to know, as the cosponsor of the House resolution, and resolutions don't mean much, but Brian Baird and I co-authored a House resolution that encouraged taxpayers when they receive their rebate from the stimulus package that they would invest those rebate dollars into efficient and effective ways to save energy, from weatherization to just new energy technologies, a host of things.

I just want to know, Mr. Secretary, outside of the bureaucracy and the running of the budgets and the spending money here and there, what is the Department of Energy doing to try to bring consumers to a better place on fuel, on electricity utilization—across the board? Because I think that just the money and the programs and the spending is not enough. That is the frustration that we all have, every one of us here, at this pain that we are in right now on energy costs and what to do about it. It is the topic du jour when I am at home.

I think it is very encouraging to see a major utility like TVA actually talking to their customers about ways to improve the bottom line, and things that you can invest in. We signed onto this resolution because if people are going to have, you know, $300 to $1,800 more in their pockets here in 8 weeks—well, first I would like them to pay down debt, but that doesn't really help the economy. Investing in new energy investments does help the economy and it helps

them, and it helps our country in terms of independence. It is a freedom issue. What is DOE doing there, outside of your offices in Washington, D.C.?

Mr. ALBRIGHT. Is that to me?

Mr. WAMP. Yes, sir, Mr. Secretary.

Mr. ALBRIGHT. We have on our website an efficiency section to suggest things that can be done. We also suggest that utilities and others help educate the public. I think your point is a very good one because we know that on energy efficiency matters in the home—insulation, caulking, CFLs, fluorescent light bulbs and other means of conserving and being more efficient in energy use—you have about a $2.50 return for every $1 you spend.

So not only would this money go into the economy and help the economy and purchase products, but the $300 to $800 that the consumers are going to receive would get a one-and-a-half times return on the money they spend. So it would be good all the way around.

I think our job is to help educate the public better, as TVA is doing. A lot of utility companies have free energy audits that they are willing to do, certainly for businesses, and I think some will do for homes as well—help analyze them.

Mr. WAMP. I will jump over to Andy, then. In your advocacy to utilities, are there ever utilities—have you called a meeting? Have you encouraged them all to do this kind of thing?

And then on fuel with consumers, at what point is the administration going to say, yes, we do have a big problem and one of the solutions is that consumers look at ways to conserve and save.

Mr. KARSNER. Thank you, congressman. And thank you for your leadership in the realm of efficiency in general and all you do every day when we are not even having hearings.

I think you have got it right in the sense that the federal government sitting up here cannot reach every consumer and motivate the end and the outcome we see either macroeconomically or even at the home level. So the question is, what will we do at the point of sale? And who are the parties of the relationship at the point of sale?

Kevin and I, our two offices, the Office of Electricity that has primary responsibility for utilities, and us with efficiency, have worked together with EPA and put under the same tent for the first time all the utilities in this country—public and private—all the public regulators at the state level who actually have the jurisdictional responsibility for those utilities, and formed a national action plan for energy efficiency with principles that would prioritize efficiency.

And for the first time, instead of saying it is just good, it is virtuous, we should educate you on it, we are quantifying it and trying to come up with schemes to profit and motivate the sector to win from it. So we think the more utilities that can be incentivized to profit from quantifying efficiency gain as a resource, the more we would penetrate and be able to use those tax credits that the consumers will have it in their face, with advertising and education at the point of sale, and say I want to buy these things.

Now, we also do the standard things and have expanded more than ever before—modernization and expansion of ENERGY STAR

for the first time since the program came over to DOE, availing more products, water heaters for the first time being listed, moving on to LED lighting, et cetera. So we are putting out a lot more choice, a lot more availability. We are in the consumer's face as never before with the choices, but we need the people locally to be able to profit and motivate and build their businesses around gaining efficiency from that.

COORDINATION OF EERE AND SCIENCE PROGRAMS

Mr. WAMP. One other question for you, Andy. Dr. Orbach comes in here the day after tomorrow, and through the Office of Science we have requests for bio-energy investments and you have the bio-hydrogen program, the bio-refinery, biomass, bio-ethanol, these research centers. How does the Office of Science and your office coordinate these programs? And how are they complementary with each other? And how do you make sure that we are not duplicative in these budget requests?

Mr. KARSNER. That is a great question. It is particularly poignant coming from Tennessee where Oak Ridge has a big applied science responsibility on cellulosic bio-refining, and is also one of the Bioenergy Research Centers.

Mr. WAMP. Yes, sir.

Mr. KARSNER. Generally, Ray and I talk about the pipeline between us, basic and applied science, having a weld and trying to make that weld seamless and frictionless in terms of the throughput. Bearing that in mind, we have a responsibility under a timeframe and a stretch goal and now a legal mandate to reduce and displace 15 percent of our gasoline supply through alternative sources within a decade. That is going to take some redundancy in effort, some parallel paths. There is not going to be a single path that will be the best, given that time compression.

So we are going to make investments right now in scaling cellulosic facilities that enable process integration in the marketplace. Right now, today, we are breaking ground on them and testing them to come down the cost curve, because we don't know what the price point for gasoline will be over the course of that decade. Ray is working on longer-term advanced genomics, how to break down lignocellulosic walls.

And if the basic science laps the current state of applied science, that is okay. Great. We have made a good investment in those things.

Mr. WAMP. Thank you, Andy.

Thank you, Mr. Chairman.

Mr. VISCLOSKY. I am going to recognize Mr. Olver in a second.

If I could follow up on Mr. Wamp's line of questions as far as people talking to each other.

DARPA

Mr. Karsner, the Defense Advanced Research Projects Agency, DARPA, posted a broad agency announcement last November for the production of biofuels from cellulosic and algae feedstocks. This is intended to find a surrogate for petroleum-based military jet fuel. I believe in his opening remarks, Mr. Hobson alluded to that. As I understand it, current commercial processes for producing bio-

diesel yield a fuel that is unsuitable for military applications which require higher energy intensity.

Is DOE aware of this research sponsored by DARPA? Are you cooperating with them?

Mr. KARSNER. The answer to both of those questions is yes, sir, we are.

Mr. VISCLOSKY. How are you cooperating with them?

Mr. KARSNER. As you noted, they are working very specifically towards their fuel needs. They are the largest consumer of fuel in the world, and primarily on distillates and JP–8. So they are looking at lipid-based fuels akin to biodiesels. Predominantly, our program is based on alcohol-based fuels for lightweight vehicles in the transportation sector. Where we have a nexus is working with them on codes and standards and acceptability to remove the barriers of those lipid-based fuels.

This is an area where we wouldn't want redundancy in program, but constant communication and comparative notes. They have a metric to get under $3 for JP–8 and distillates. Our goal is to use some of their work and get it into the dieselization of vehicle manufacturing. So we are working with ASTM and other standards organizations to ensure higher blend rates and removal of barriers of the fuels that they——

Mr. VISCLOSKY. Have there been any positive results because of that communication and cooperation to date that you could supply for the record so we could say, okay, you have been talking to each other? Do you have something to show for it?

Mr. KARSNER. Yes. I would like to report back to you for the record on that. I think we would be able to demonstrate some movement and progress on the codes and standards and things that are enabling pathways for those fuels to arrive.

DARPA RESULTS

The Department of Energy is working cooperatively with the Department of Defense (DOD) on biofuels development. The Biomass Research and Development Board, co-chaired by DOE and the U.S. Department of Agriculture, coordinates federal activities to promote use of biobased fuels and products. DOD is also a member of the Board. The Defense Advanced Research Projects Agency (DARPA) participated in biweekly meetings of the Biomass Conversion Interagency Working Group that reports to the Board. The Working Group is managing the development of a comprehensive, integrated federal research, development and demonstration biofuels conversion plan with a target delivery by October 2008.

DARPA focuses on developing JP8, military jet fuel, from cellulosic or algal feedstocks, with a goal of demonstrating scaleable and commercially viable processes at affordable costs (less than $3 per gallon). DOE is collaborating with DARPA and the American Society for Testing and Materials International in technical committees to develop standards for fuels, including JP8, which will enable targeted development activities and ensure fungibility of alternative fuel based JP8 formulations. DOE is also documenting material properties on thermochemically derived fuels from biomass feedstocks that can be used as a replacement for distillates and JP8 fuels. These alternative fuels, such as Fisher Tropsch liquids, will be produced from DOE validation programs in sufficient quantities that can be evaluated for a DOD application. DOE-funded National Laboratories such as Pacific Northwest National Laboratory and the National Renewable Energy Laboratory, together with private industry partners, have also submitted proposals to a DARPA broad agency announcement, BAA08–07, to develop JP8 from agricultural or aqua-cultural feedstocks.

Mr. VISCLOSKY. Okay. I appreciate the fact that there is communication. I would like to see some discernible positive results of some of that, too.

Mr. KARSNER. Absolutely.

Mr. VISCLOSKY. Mr. Olver?

Mr. OLVER. Thank you very much, Mr. Chairman.

I would like to address a few questions to Mr. Karsner.

EERE FY 2009 BUDGET REQUEST

I notice that the budget for energy efficiency and renewable energy is down for the 2009 request by $467 million under the 2008 enacted number. But I also notice that is actually up by roughly $19 million or something like that over the request for 2008. Now, I have been trying to figure out what has been happening here.

You have had the budget since December 24, when I guess it was signed, so it is now 2½ months after that. Let me just understand. I am trying to sort out what this budget is made of. It looks to me that several of the accounts that are basically internal to the department and its operations. Those look like the program support, the program direction, the facilities and infrastructure, and the federal energy management program. Would that be roughly correct?

The other programs are from hydrogen technology down through building technologies and industrial technologies. I am reading down this list of items, plus weatherization, would be money that goes out in contracts and grants and contracts and R&D contracts to be done by contractors. Would that be roughly correct?

Mr. KARSNER. Roughly correct. Roughly correct. I wouldn't say there is a firm wall, for example, for the Federal Energy Management Program. It has a lot of contractors and stimulants on the efficiency side. But I think your generalizations are roughly correct.

FY 2008 OBLIGATED FUNDS

Mr. OLVER. Well, if that is the case, for instance since we are out now 2½ months, I am wondering what amount of those contracted monies are out? How much of that is obligated? What is the rate of obligation? And do you expect to obligate? Could you show us, for instance, what the obligation rate at this point is and what you intend to obligate before the end of the year?

Mr. KARSNER. Yes, sir. I do think we could report back to you on that.

Mr. OLVER. You think you could report back. All right.

OBLIGATED FUNDS

Approximately $917.2 million has been obligated as of May 2008 for Energy Efficiency and Renewable Energy (EERE) Programs. EERE's current rate of obligation is $114.7 million (12.5 percent) per month. EERE has obligated 53.3 percent of the approximately $1.72 billion in total FY 2008 appropriated funds. As EERE historically has higher monthly obligations in the last months of the fiscal year, EERE anticipates obligating the remaining FY 2008 funds before September 30, 2008.

FACILITY INFRASTRUCTURE

For instance, in facilities and infrastructure, let me ask a little bit more specifically. That is one where the 2008 allowance, the 2008 enacted number, is up by almost $70 million over the request,

which was $7 million. And you are going back to a request of about $14 million. How much of that has gone out? Do you have any sense of what the intent is on that, since there were clear intents on the part of Congress in coming up with that appropriation?

Mr. KARSNER. And we are fulfilling that intent very specifically, that is, new facility infrastructure at our applied lab, the National Renewable Energy Lab in Golden, Colorado, and very specifically that it is going to a systems integration facility. So because the appropriations actually arrived in January, the mark in December, as you noted, I believe that is in the early stages of soliciting design, et cetera. But that speaks for that amount of money. It has begun to catalyze in process.

But to answer your question much more specifically as to the milestones and metrics at which it will be dispersed, I would have to report back to you.

NEW FACILITY INFRASTRUCTURE AT NREL

Approximately $69.3 million in FY 2008 funding for NREL equipment and construction is expected to be obligated by June 2008.

The intent of Congress is that $54.5 million is to be used for the 1) Energy Systems Integration Facility (ESIF); 2) approximately $7.9 million is to be used for equipment in the Science and Technology Facility (S&TF) and the Solar Energy Research Facility (SERF); and 3) approximately $6.8 million is to be used for the South Table Mountain Site Infrastructure project. All funds will be obligated by June 2008.

The milestones and metrics for funds to be dispersed for the ESIF ($54.5 million in FY 2008) are scheduled as: request for proposal July 2008; award design November 2008; award construction May 2009; award equipment November 2009; construction complete March 2010; and equipment complete December 2011.

The milestones and metrics for funds to be dispersed for the equipment for the S&TF and SERF (approximately $7.9 million in FY 2008) are scheduled as: request for proposal August 2008; award design December 2008; award equipment purchase contract August 2009; and install equipment February 2010.

The milestones and metrics for funds to be dispersed for the South Table Mountain Site Infrastructure project (approximately $6.8 million in FY 2008) are scheduled as follows: request for proposal July 2008; award design December 2008; award construction June 2009; and construction complete September 2010.

Mr. OLVER. Okay. But generally, you are saying you are actually going to fulfill that?

Mr. KARSNER. Absolutely.

WEATHERIZATION

Mr. OLVER. Let me follow, then, on weatherization. For instance, the request in 2008 was $204 million. The appropriation on our part for the 2008 fiscal year was $282 million, a $78 million increase. But your request for 2009 has now been dropped to $58 million, which is a drop of $223 million below the enacted number for 2008.

I am curious. I am now zeroing in. I gave you the general question first as to what was going to be going out. I am zeroing in on that one. Are you intending to actually get those $282 million out by the end of this year?

Mr. KARSNER. Yes sir.

Mr. OLVER. You are?

Mr. KARSNER. Absolutely.

Mr. OLVER. And then you basically, the program goes over the cliff. It has been there as a request in 2008 of $204 million. You

are dropping that request to $58 million. That is an enormous drop in request for a program which has been up there year after year, and certainly saves a lot of people a lot of money. People who are low-income folk and can use that weatherization to help them with their budgets. That is a major negative, the major negative in the difference between your two budgets in 2008 and your request for 2009.

Mr. KARSNER. That is correct.

Mr. OLVER. What do you have to say for that policy of essentially dropping weatherization off the cliff?

Mr. KARSNER. What do I have to say for it? What I would say for it is that weatherization assistance, income-related assistance for people below the poverty line is a good and worthwhile objective for a great and generous nation. So it is not a question of whether you do it, but how you do it, how effectively you do it, where it belongs in the budget, and how effectively you are achieving your objectives.

After almost 3 decades, we have weatherized about 5.5 million homes, out of the 27 million annually eligible. It is clear that those lines are not going to dynamically move based on the status quo pursuit of weatherization where it is lodged, competing on rate of return inside the nation's energy R&D applied science portfolio that is committed at a mission level to reducing climate change emissions within a decade, and to energy security.

It is a very awkward place for an income-assistance program, and year after year this discussion takes place because on the metrics of rate of return, it cannot compete with the rate of return of all the other things that Congress has us investing in.

HYDROGEN TECHNOLOGY

Mr. OLVER. However, it is true that the request on the part of the administration the previous year was over $200 million. So it is a very great unitary change in policy between 2008 and 2009. That is what I was trying to focus upon, even though we added more money.

Again, I think my time is up. Well, okay. I think I will go on to one other one.

The one other one that I wanted to raise was the hydrogen technology program. You are dropping that one off a cliff. I really want to know, not quite as high a cliff as the weatherization, but you have dropped that one by $64 million below the enacted from last year. And the enacted from last year is only a couple million apart from what your request was last year. So it is not a policy difference that we have been trying to impose, as certainly is true with the facilities and infrastructure and the weatherization program.

But what are you dropping out of the hydrogen? Can you describe for me what is being left out that you have been doing in 2008 and before?

Mr. KARSNER. Yes, sir. The optics are a little bit deceiving in hydrogen when you talk about $64 million, because actually it is roughly half that amount that the hydrogen budget is going down.

Mr. OLVER. Where is the rest of it hidden?

Mr. KARSNER. The rest of it is moving over to the Vehicle Technologies Program, because it deals with things like education, codes and standards, learning demonstration, that really cross all vehicle platforms. In other words, we don't want education to be only about hydrogen. We want it to be about all alternative fuel sources.

Mr. OLVER. Okay.

Mr. KARSNER. So that rightfully moves over and leaves the hydrogen program with an exclusive focus on research and development for hydrogen fuel cells, to move down the cost curve more rapidly. What we have done this year in readjusting the hydrogen portfolio is to eliminate our investment in production and delivery R&D, which is funded elsewhere across the department, particularly in the Office of Basic Science, where they are moving to have direct sunlight conversion to hydrogen, microbial and bio-conversion to hydrogen. There is a nuclear-to-hydrogen conversion program.

We used extra money to amplify those areas on the hydrogen posture plan critical path, namely focus on the PEM-fuel cells, bringing the cost point closer to our target of $30 per kilowatt, and the more intractable program we have had with hydrogen storage, which is the key impediment to being able to get to a fuller transportation economy.

So those two areas went up, and hydrogen production and delivery, at least in my portfolio, but not elsewhere across the department, went down, largely because the question of renewable sources converting to hydrogen is substantially a commercial one, one that we think should be pursued through the loan guarantees. We have worked on electrolysis. There is not a major mystery to it. We do it at NREL every day.

So converting from existing renewable sources through electrolysis is something that we want to see more robustly in the commercialization camp, and we want to see the other focuses on production more in the basic and other programs.

Mr. OLVER. I would suggest that what we are talking about ties into what Mr. Israel was saying earlier about battery technology. The storage issue is one where if we had a really good battery system that served within the vehicular use of hydrogen, then we would have made an enormous advance. I am not sure that we are going to make that, but I would support his comments about what are we doing and are we doing enough about R&D in the battery technology field.

Thank you very much.

Mr. VISCLOSKY. Thank you.

Mrs. Emerson.

RENEWABLE ALTERNATIVE ENERGY PROJECTS

Mrs. EMERSON. Thank you, Chairman.

And welcome to you all. Thank you for being here.

Let me just ask a question. We have the Department of Energy, the Department of Agriculture, Department of Interior, Department of Defense—how many other departments are actually working on renewable alternative energy projects?

Mr. KARSNER. I would be surprised if almost every agency in the government didn't have some sort of play on energy. It is so cross-cutting at this juncture.

Mrs. EMERSON. So do you all ever get together and talk to each other?

Mr. KARSNER. Yes, we do. In fact, I would say although we have a long way to go, that we have never had a more robust interagency process at a higher level. We are better in some areas than others. Biofuels and the things that feed into the Energy Independence and Security Act, that have been prioritized in the recent legislation, have caused us to get together not less than once monthly at the level of presidential appointees and higher for the Biomass R&D Board.

That involves the National Science Foundation, Agriculture, Transportation, EPA, OMB, OSTP, et cetera. We would like to do the same thing for permitting renewable energy across federal lands, with siding permitting, grid integration issues, something we work on with Kevin. And we can get much better, but we recognize that problem of stovepiping and trying to overcome it.

Mrs. EMERSON. So are you all working at complementary purposes or cross-purposes in some areas? It seems to me that if we are going to spend the money that we are spending that everybody should be working in a complementary fashion so that we can actually leverage that money.

Mr. KARSNER. Congresswoman, I think you are right on. That has to be the driver of the agenda, that fundamentally how do we rationalize the core strengths and history of these institutions to put their best foot forward, without excessive redundancy, but parallel competitiveness where applicable.

Mrs. EMERSON. And do you not feel that that is happening at the moment, with the exception of perhaps that one area that you mentioned?

Mr. KARSNER. I chronically feel like it is something we can be better at, but I do think that there is enormous engagement at the moment. We just hosted the Washington International Renewable Energy Conference, involved the Department of Commerce from the standpoint of export and trade of renewables, and the Department of Agriculture actually took the lead with the Department of State on that. Obviously, the Department of Energy was indispensable. We presented to the world a very ecumenical approach to U.S. government equities in renewable energy that demonstrated exactly that concept.

Mrs. EMERSON. Except that once you have egos involved, everybody wants their little bit of turf. Sometimes that is okay, and sometimes it works to the disadvantage of the public. People are so intent on having their little piece, and they are not willing to give it up perhaps for the greater good, so that we are actually trying to be more efficient, and to move these technologies forward much faster than we are right now.

So it is a little bit frustrating, particularly when you have your constituents quite rightfully so up in arms about the cost of gasoline. And when you live in a rural district like mine, quite frankly we are over $3, which is shocking, and people drive ordinarily 45 minutes to an hour to work every day. And that is on highways,

so you know how much gas they are having to use on a weekly basis.

I then got another batch of letters yesterday from some high school students, all of whom have part-time jobs. They have their own cars. They have to pay their own gas. And they are making minimum wage. Sure, they are living at home, but still it is very, very troublesome to me.

So once a month is great, but hopefully we have a strategic plan in place among all of the agencies so that we are actually going toward the same goal, so to speak.

Mr. KARSNER. That is right. And we are producing a strategic plan that I think will be up in front of Congress shortly. But the bottom line that you are pointing to, the problem is that we have institutions and bureaucracies in this country that were set up to fight a Cold War, and we haven't adapted to 21st century challenges driven by energy, whether they are economic things that affect people at home, whether they are macroeconomic things like our global security.

So we are fighting this challenge that we have, both environmentally and security and the pocketbook issues, through these pockets of government and good will. So it is going to take your kind of thinking to reform that.

FUTUREGEN PROJECT

Mrs. EMERSON. It is kind of back to basics—easy, common sense stuff for all of us. But I still worry about the turf issue.

But thank you. I appreciate it. I know you all are working hard and doing your best, but it is just interesting. I have to go over to my ag subcommittee where we are talking about the same exact thing. I am going to ask them the same question, if we haven't finished that before I get there.

Let me ask a question, if I could. I don't remember if it was you, Secretary Albright. In your testimony, you were talking about the need on climate change technologies, and we are spending a lot of money to try to reduce greenhouse gas emissions and capture carbon, et cetera, et cetera.

So that brings me to the whole issue of the FutureGen project. I realize we had a discussion with Secretary Bodman about that. But I guess what I want to ask is, it seems to me—and I know the chairman may have some more specific questions—but it seems to me that if we are intent on trying to capture as much carbon or sequester as much carbon as possible, and the FutureGen project actually was at a 90 percent capture rate, so now we are just going to kind of throw that one away and we are going to do these other projects that may not be as advanced in the sequestration of carbon, at least the percentages might not be as great.

And then we are delaying again because we are not going to finish that project out totally, and we are going to start all these other ones, so we are just postponing and postponing. I just don't get it.

Mr. ALBRIGHT. The administration remains committed to the goals of FutureGen and to FutureGen as a project and as a concept. The concept was and remains to generate electricity with coal at a significantly reduced carbon dioxide footprint. We remain committed to FutureGen.

The project that we embarked on with the Alliance started out as a $950 million project. It had grown to $1.8 billion. Frankly, no one believed that that project could be built for $1.8 billion, and please remember it was a research project.

FUTUREGEN PROJECT COST

Mrs. EMERSON. Right. Have your costs at the Department of Energy also doubled?

Mr. ALBRIGHT. The costs—and I am not trying to point fingers here at all—the costs were due to costs that were beyond—I guess costs are always in someone's control—but they were market-driven costs. The cost of engineering went up. The cost of steel went up. The cost of everything——

Mr. VISCLOSKY. Why does everybody always blame the steel industry for the failures at the Department. I am serious about that. Every witness comes in here and claims——

Mrs. EMERSON. It is China who is buying all of the steel.

Mr. ALBRIGHT. Well, the cost of everything went up.

Mr. VISCLOSKY. Sorry to interrupt.

Mrs. EMERSON. That is fine, Peter.

Mr. ALBRIGHT. The cost of everything has gone up and it is just the cost of production, the cost of the various ores, whatever they may be, from steel to uranium. All prices went up.

Mrs. EMERSON. Okay, so the cost of the whole project has doubled. Has it also doubled your portion at the Department of Energy? Has that cost also doubled as well?

Mr. ALBRIGHT. The portion we were going to bear, yes. We were going to bear 74 percent of the cost on the taxpayers, with 26 percent being borne by the Alliance and its members. Again, we remain committed to the goal and we believed that the costs were going to certainly go above $2 billion to perhaps $3 billion. This threatened to eat up a huge portion of our coal research budget.

Once we recognized that and once we believed that coming back to Congress with a $3 billion to $4 billion project would cause its cancellation, not unlike some other projects that have been cancelled. We didn't want to see that. We sat down with the Alliance, starting in April of last year, to try and renegotiate this. We took our concerns to them, and frankly I think they understood and shared some of these concerns.

We negotiated over the cost. We talked about technology and how could we change the project. Negotiations went back and forth, but we just weren't getting where we needed to go. I asked that we look at the market generally. The market had changed, and one of the things that got my attention was that when we started this program, nobody was building IGCC plants in the private sector.

Now, we have had 30-some-odd IGCC plants discussed. I have forgotten how many, but at least five or six have sought permitting. Most have been turned down because they didn't have the carbon capture and sequestration element to the plants. One has just been approved in West Virginia this week or last week. I asked our group at one of our labs, "Does this represent an opportunity? Can the private sector bear the cost of building the plant, and can we focus on the portion that is keeping the plants from being cer-

tified, and save money and focus on the technology that was necessary, that being the carbon capture and sequestration"?

They came back and said, "We believe we will do a number of things. One, we will save a lot of money for the taxpayers. We will focus on the cost component of this, which the private sector has been reluctant to bear. Plus, we will be able to put electricity onto the grid for actual operation, actual use, as opposed to in a more purely research environment."

We believe this is a better use of taxpayer money and we believe it is something that is sustainable, that can be replicated at other plants, and we hope will give us an opportunity to demonstrate this with different types of coal, different facilities, and multiple settings, as opposed to a single research center.

Mrs. EMERSON. It is just kind of peculiar because you said April, and I think our Illinois colleagues who talked to us about this all the time, said they didn't get notice until November because the costs really until that EIS statement was done or something in November.

Mr. ALBRIGHT. We did try to keep this in-house and discuss it among the partners. It was easy to run the numbers to see costs rising, but we did try to keep the negotiations at the table.

REPI PROGRAM

Mrs. EMERSON. Okay. I need to switch course. Thank you. I need to switch. I just have really a quick question, then I have to go over to ag. I am sorry, Mr. Chairman.

It is a question with regard to REPI. In a rural district, I have so many different utilities, I can't even count them all. But we also have a lot of people who took advantage of the REPI program. I guess you eliminated it in this budget, the renewable energy production initiative. So I have a lot of folks who relied on some assistance there. It provided a lot of value for my guys. Why did you all zero that out? Was that an OMB thing because the cost-benefit ratio didn't pan out or something?

Mr. ALBRIGHT. I would be happy to stumble around and try and answer that. Andy can give you a better answer.

Mrs. EMERSON. Whoever wants to.

Mr. KARSNER. Maybe a better answer, but I don't think it will be more satisfying.

Mrs. EMERSON. Just tell me the real reason.

Mr. KARSNER. Well, the real truth of the REPI program is that it doesn't serve the purpose for which it is intended, which is to be an incentive to public power companies to produce renewable energy. It does not provide that incentive. It has been a small static amount, formulaically distributed across public power companies after the investment was already made.

So it wasn't an incentive to make the investment. It is almost a retro-rebate. We are not adverse to the idea that public power ought to be incentivized, but that mechanism—very old, moving along the budget line as it has—does not serve that purpose.

ELECTRICITY RATES

Mrs. EMERSON. Okay. I understand. I appreciate that.

Let me ask you a question, and this has to do with electricity rates. We have a small—well, it is actually not small—a company in Missouri, but it is not one of the big guys either—whose rates are, they have told their commercial customers that their rates are going up 74 percent since last year. And I find that shocking, and it certainly does not help economic development in little bitty communities that are served by this particular company.

Two of the things that they cited as causes for this, which to me are hard to understand, one is because they have switched over and they are actually using some wind sources now, and also increased costs from the federal government for hydropower. I just want you to tell me whether or not they are just blowing smoke, or whether that is true.

Mr. KARSNER. I don't know the precise case. I would be happy to look into it. It sounds like blowing smoke to me.

Mrs. EMERSON. Yes.

Mr. KARSNER. In fact, both those sources would be cost stabilization sources.

Mrs. EMERSON. I would think so.

Mr. KARSNER. And both ultimately are less volatile and do not have a fuel through-put cost. So typically you see wind where it is newly installed under a long-term contract reducing cost as it is doing in Texas today and giving it a more predictable profile for the longer term. But we would be happy to look into that.

Mrs. EMERSON. I just appreciate your making that comment on the record for me to pass along when I have to deal with this next week.

Mr. KARSNER. Sure.

Mrs. EMERSON. Thank you.

Mr. KARSNER. Anytime.

Mr. VISCLOSKY. Mr. Calvert.

Mr. CALVERT. Thank you, Mr. Chairman.

CARBON SEQUESTRATION

It seems to me, and I am new on this committee so I apologize when I ask questions that I would like to get an answer for, the technology to sequester carbon. We have invested quite a bit of money in that over the last number of years. Maybe a short answer—how far along are we, realistically, to sequester carbon? And is it a long-term solution? Realistically, is there a capacity to store this carbon, to do it efficiently and effectively throughout the United States?

Mr. ALBRIGHT. The technology exists to capture, we believe. It has not been used on a coal-fired plant, at large-scale, but we hope to do it in the future. The sequestering of the carbon, we are in the research stage. We believe it is feasible, it certainly has been done at labs. If indeed it works, it has multiple benefits because you can use it to extract oil, gas and other energy sources. We believe that it is going to work.

Mr. CALVERT. Will the cost of the sequester per kilowatt—at what point does it become uncompetitive with other energy sources?

Mr. ALBRIGHT. It is going to cost more. Capturing and sequestering carbon will, in all likelihood, knowing what we know today, add costs.

COST OF CARBON SEQUESTRATION VS. COST OF NUCLEAR POWER

Mr. CALVERT. Relative to nuclear power, at a cost per kilowatt, at what we know today on sequestering carbon, is carbon going to be noncompetitive with nuclear based upon what we know today about the cost of that technology?

Mr. ALBRIGHT. I don't know. Jim, maybe, can give us some better estimates on costs, but the fact of the matter is whatever the cost, if we are going to demand that we reduce our carbon dioxide emissions to the degrees that policy decisions are driving those reductions, we are going to have to capture that carbon. We simply can't build enough nuclear to meet our energy demands.

If we continue with our $CO_2$ reduction demands, I don't know—absent some breakthrough technology—I don't know that there are a lot of other options. I don't know the exact qualitative cost comparisons as we currently stand.

Jim?

Mr. SLUTZ. No. I think at this stage, there are many different studies out there with different ranges, but fundamentally you start with a concept of energy demand in the future, and we are going to need coal, we are going to need nuclear, we are going to need natural gas, we are going to need renewables. We are going to need them all. So if you are going to use coal, then a fundamental enabler in a world where we are dealing with mitigating climate effects, then we have to deal with managing the carbon, and sequestration is seen as the most likely and viable because the volume of $CO_2$ produced from coal is very large. It is a very big-scale issue to solve.

Your question of do we have capacity in the United States to sequester carbon? The answer is yes. We have done the significant work of analyzing what the capability around the country is. Our research program is very geared toward—we have seven regional partnerships, and the strategy in that is that we have to be able to demonstrate at-scale sequestration in various geologic settings around the country.

The only area, just from a geology standpoint, that doesn't lend itself to sequestration in any way is New England just because of the geology. The rest of the country has a significant opportunity with sedimentary works and basins, so there is potential there.

OTHER COUNTRIES CARBON SEQUETRATION RESEARCH

Mr. CALVERT. Are any of our competitors—say, the Chinese, and I know they put up a coal-power plant, a number of them every month—are they doing any studies at all in China right now on sequestering carbon?

Mr. SLUTZ. Well, they actually are.

Mr. CALVERT. Have they done anything?

Mr. SLUTZ. Well, just earlier this week, they announced a joint venture with Australia, for instance, on a power plant and some capture capability. It is not near of the scale of the work that we

do, but they are very engaged in some of the international dialogues on carbon capture.

ETHANOL

Mr. CALVERT. Another issue, on ethanol, especially corn-based ethanol. The state of California, we are paying north of $3.50 a gallon for gasoline right now, the highest in the country, I think. And there is some frustration about air quality issues, especially in Southern California. There are those who say that actually corn-based ethanol adds to the problem, and doesn't resolve the problem. It is not as efficient an oxygenate as others.

So we keep looking to cellulosic ethanol that is coming online. Again, realistically, has there been any realistic breakthroughs as of yet? I know you keep looking at that silver bullet as a way of getting away from corn-based ethanol. Is there anything on the horizon that seems promising in the short term?

Mr. ALBRIGHT. We believe that there is. A lot of research is going on into the biogenetic composition of plants and the non-food parts of plants to break down the cells. The most costly part of cellulosic ethanol, the biggest energy hog, is in the initial breaking of the cell structure of the plants.

Mr. CALVERT. I guess the question is, we have invested a lot of money in research in this. Are we any further along than we were 5 years ago?

Mr. ALBRIGHT. I think we are much, much further along. Again, that is Andy's purview and he knows this inside and out.

Mr. CALVERT. All right, Andy. How far away are we from a realistic technology for cellulosic ethanol?

Mr. KARSNER. Our objective is to have plants at commercial scale and commercial production by 2012. We are well on the way to those metrics and milestones. You asked about 5 years ago. The cost of cellulosic ethanol production 5 years ago was in excess of $6. Today, our price point is approximately $2.10. We have a cost metric goal of $1.31, indexed what was then when we began the program the cost of conventional corn-based ethanol.

We think that with the movement in oil prices, the metrics obviously move closer in time. So I would say you have every reason to be confident that it is imminent and inevitable that we will have cellulosic-scale commercial production in this country within a timeframe that makes a reasonable impact.

Mr. CALVERT. Thank you.

Mr. ALBRIGHT. If I might just add one thing Andy left out, is that we do hope to have it as a commercial basis, but cost-competitive commercial basis.

ELECTRIC TRANSMISSION INITIAL CORRIDOR DESIGNATION HEARINGS

Mr. CALVERT. Okay. One last question on transmission. In California, we don't produce our own power per se. We bring it in, so transmission is extremely important to us. As I understand it, on March 6, DOE issued a notice denying further hearings on initial corridor designations. This decision, much like the first one designating corridors to begin with, is not likely to be popular with many of us here in the House. So please explain the consequences of this latest decision and what are the next steps?

Mr. KOLEVAR. The department's order last week denying rehearing is an administrative action. After the Secretary of Energy announced the corridor designation in early October, the department entered under the auspices of the Federal Power Act, a 60-day period of rehearing wherein parties could contact the department and write in and object or if they want to support—and some did—our decision for a variety of reasons.

We extended that rehearing period in early December for the purpose of considering all of the comments that we had received. After considering all of these comments, we determined that by and large they raised the same issues that were brought to our attention during the period that immediately followed the draft corridor designation in April of 2007.

So we are confident that the decision that the department made is consistent with the law, and we hope will have an appreciable impact on the ability to help secure more resources to feed growing electricity needs. So this was really an administrative action. Folks that had given comment to the department during the draft period and that gave comment to the department during this period of rehearing now have the opportunity, now have the standing to go into court and challenge the department's decision. I am certain that is happening probably as we speak. We expect a number of parties to go to into circuit court and challenge the department's decision.

Mr. CALVERT. Thank you.

Mr. VISCLOSKY. Mr. Simpson.

Mr. SIMPSON. Thanks, Mr. Chairman.

I always find these discussions interesting. I keep writing down things that you say that I want to ask you about.

COAL

Mr. Secretary, you said we can't build enough nuclear Plan B to meet our demands. Is that a political or a technical comment?

Mr. ALBRIGHT. Depending on how you define "political," it is probably a little of both. Siting these plants, building them, getting acceptance within the timeframe necessary to meet our energy needs, I can't conceive of the ability to build enough nuclear. We currently have about 20 percent of our electricity generated from nuclear, over 50 percent from coal. It is cheaper, easier, faster to build a coal plant; cheaper, easier, faster to build a natural gas plant.

Technically, we can get there. There is probably not a technical reason. There may be some reasons getting the components for nuclear plants if we were to build that many.

Mr. SIMPSON. I don't say this critically. I realize that we are 50 percent coal and we are going to rely on coal for production of electricity well into the future and stuff. But this whole discussion that we are concerned about greenhouse gases because we know we have to reduce our carbon footprint, so we are looking at ways to produce electricity from coal with less carbon footprint, sequestration and so forth.

Do we know the long-term impact of sequestration on underground geology? Have we done long-term studies on the impact of sequestration on underground geology and so forth?

Mr. SLUTZ. Obviously, we are collecting a lot of information from some of the—you know, our experience on sequestration in saline aquifers is limited to small-scale. We are now moving into larger-scale studies. Those will give us empirical data that we can use to model. We have a lot of information in geology, so our geological models are good. But again, we still need to do work in those areas, and there is uncertainty in that long term.

An area where there is very long-term information is on $CO_2$ being used as a method to enhance oil recovery for decades. So we have real good information on that. Again, so it is a matter of translating that information, that we know, to things that we don't know. So there is still work to do, but we do have a good path forward on that research.

Mr. SIMPSON. Back to the original discussion, the thing that I find interesting is that we all know that we are going to have to reduce the carbon footprint, and we all know that a majority of our electricity is produced by hydrocarbon energy now. And yet when I look at the budget, we are actually putting more in coal research than we are in nuclear research, which makes me wonder why.

If you are really going to reduce your footprint, you are going to have to reduce your reliance on those sources of energy and get into renewables, wind, solar, other types of things which present their own problems to some degree. Are we doing anything about the hazardous waste that is actually produced by batteries that we talked about earlier, or by solar panels, in both disposal of them and the building of those types of things? I mean, they produce hazardous waste that oftentimes is more hazardous than anything nuclear. Are we doing things in research on how to deal with those hazardous wastes?

Mr. ALBRIGHT. We are. We are researching all of that. I think one of the things that we are learning is that we shouldn't rely on any one source of energy to generate electricity, and be so dependent on coal, or in the case of transportation——

Mr. SIMPSON. What do our long-term studies look like? In 20 years, what do we expect the percentage of our electricity produced by coal to be? Increased? Decreased?

Mr. ALBRIGHT. About the same is what we think in 20 years. I think if you look out 50 years, the hope—and it is hard to look out 50 years. I have a hard time understanding the past, let alone explaining the future.

Mr. SIMPSON. I have a hard time understanding tomorrow. [Laughter.]

EFFICIENCY OF COAL PLANTS

Mr. ALBRIGHT. If you look out 50 years, you start to see things change a bit. I think there is a lot of research that needs to go on with coal. How to burn coal more effectively and efficiently, and to sequester the carbon. We are at around 40 percent efficiency now, which is high-efficiency for a coal plant, very high efficiency. If we can increase that efficiency, we burn less and generate more.

Mr. SIMPSON. What is the efficiency?

Mr. ALBRIGHT. The efficiency of a coal plant?

Mr. SIMPSON. Yes.

Mr. ALBRIGHT. It is about 40 percent now, for a very good coal plant.

EFFICIENCY OF WIND POWER

Mr. SIMPSON. What is the efficiency of wind power?

Mr. KARSNER. The efficiency of wind power is a function of the site that is chosen. So it really depends on what the price is locally. Generally speaking, people don't like to develop today at less than about 35 percent. But I just visited a site in Hawaii that was in excess of 50 percent. So the higher the efficiency, the more revenue and people are very motivated to invest high in efficiency in wind.

NUCLEAR ENERGY

Mr. ALBRIGHT. If I may, I think the question you want me to answer is, why aren't we spending more time and effort on nuclear. I think we are. I don't believe that in current technology nuclear requires the kind of research that coal does. We have done a lot of research on nuclear. We have built nuclear plants. We know how to do it very safely, very efficiently. It is emission-free.

We continue to have some technical problems, some political problems with what to do with the waste. But as far as the technology for nuclear, there are four or five very well accepted designs for plants, three that are highly commercially viable, that are being built around the world. Most of Europe has built a lot of nuclear. Japan has built a lot of nuclear and they are doing it very safely and effectively.

We hope to build more. I believe we are looking at a nuclear renaissance. One of the things our loan guarantee program is focused on is trying to expand our nuclear production. We haven't built a plant in over 30 years, and that is a shame.

Mr. SIMPSON. It is a shame. But the one thing that gets me about the federal government, or about our energy portfolio of what we are looking at in the future, is that if John Kennedy had not said in 1960 that we were going to land a man on the moon by the end of the decade, we probably wouldn't have done it. He set a goal out there.

And we are sitting here and we are saying we have to reduce our carbon footprint. Global warming is a problem. I don't see us building a whole lot more dams around this country, but maybe making some of them more efficient and a few things like that. And yes, we are going to increase solar and we are going to increase wind power and geothermal and those kind of things, but we all know it is not going to meet the baseload that is necessary in the future.

Why aren't we setting out a picture that says by the year 2525, we expect 25 percent of our energy produced by a clean technology, nuclear power? And by the year 2035, we expect 35 percent of it to be produced by that to give us a goal and a vision of what we are going to be doing in the future. Because right now, I don't see that. All I see is the same, well, coal is 50 percent now and it will be 50 percent in the future. We have to find a way to reduce the carbons.

Mr. ALBRIGHT. The president has laid out a vision of just that. We are focusing a lot of our budget on that hope and on that promise.

Mr. SIMPSON. Which would tell me that we would be putting more of the research dollars into those things that we expect to be the future, rather than those things we expect to be decreasing in the future.

Mr. ALBRIGHT. One of the things that we were very, very disappointed in was the cutting of our ITER research facility, which would be we believe the next generation of nuclear development. That was cut substantially after our begging that it not be cut. We are in a world partnership to do basic research through this facility.

Mr. HOBSON. If I could interject something for a minute. We have had 8 years of this administration. There hasn't been construction started on one new plant. How many licenses have been applied for? And how many licenses have been issued in the last 8 years?

Mr. ALBRIGHT. I think the answer to that is certainly issued, zero. Applied for, there are a number that have——

Mr. HOBSON. But the number is a handful. The number by now was supposed to be in the double digits. This is the most disappointing thing. I said this to the secretary. The most disappointing thing is that this department has not really done it when it comes to nuclear energy, and I worry about what happens in the next administration on nuclear energy.

I am sorry to take your time.

EFFECT OF ASH PRODUCED BY COAL FACILITIES

Mr. SIMPSON. Mr. Chairman, I just have some small questions I would like to ask here.

Mr. Slutz, studies since 1970 have found that radiation exposure to people living around coal facilities is equal to or higher—and oftentimes higher—than those living near nuclear facilities. It turns out that fly ash from coal plants is the culprit. It contains high amounts of radioactive uranium and thorium. How is this ash from coal facilities disposed of?

Mr. SLUTZ. I am sorry? How is the ash disposed of?

Mr. SIMPSON. Yes.

Mr. SLUTZ. In coal facilities?

Mr. SIMPSON. Yes, the ash produced by coal facilities.

Mr. SLUTZ. Yes. I am not a coal expert on that. Our research portfolio is not in that area, but we can get back with you. I know by being in the industry, I know it is disposed of in a variety of ways, depending on the location.

DISPOSAL OF COAL ASH

Coal combustion byproducts including bottom ash, boiler slag, fly ash, and flue gas desulfurization solids are regulated by the U.S. Environmental Protection Agency (EPA) as non-hazardous materials under Subtitle C of the Resource Conservation and Recovery Act. This is based on years of extensive analysis and characterization by the EPA and state regulatory agencies of these materials, including radioactivity. The most recent survey results from the American Coal Ash Association, indicate that about 125 million tons of coal combustion byproducts were generated by 2006, of which more than 54 million tons (>43%) were put to beneficial use. The remaining 71 million tons were disposed of as non-hazardous materials in landfills. 2006 was the latest in seven consecutive years of increasing beneficial use of coal byproducts, including use as a key ingredient in the manufacturing of concrete, wallboard, and other building materials. The increasing use of coal combustion byproducts is indicative that they can be safely used in commerce.

Mr. SIMPSON. It seems that this radioactive waste at the federal level falls between the responsibility of the NRC and the Environmental Protection Agency. Does it need to be regulated? If so, whose responsibility is it for regulation?

Mr. SLUTZ. The Department of Energy, I know, is not involved in that regulatory decision, so I think it would be best directed at those other agencies, but we can follow up.

REGULATIONS OF COAL ASH DISPOSAL

Fly ash and other combustion byproducts from coal fired power plants have an extremely low level of radioactivity. The U.S. Environmental Protection Agency (EPA) has consistently found that the levels of radioactivity and trace metals in these materials are well below threshold levels for drinking water. A series of regulatory determinations by the EPA—most recently in 2000—have exempted all coal combustion byproducts from Federal regulation under RCRA Subtitle C governing hazardous wastes—that is, they are considered non-hazardous materials in terms of their disposal and reuse.

Mr. SIMPSON. Okay. Potentially, this subcommittee deals with cleanup of nuclear waste all over the country. It is where an awful lot of our budget goes and it is a problem and something has to be done. Are we creating a disposal and cleanup problem in the future for coal ash that is around the country and is going to create major cleanup problems such as we have with the nuclear industry currently?

Mr. SLUTZ. Again, we are not focused on the coal ash issue. We do on issues that when you look at some of the liability issues regarding, those kind of questions on carbon sequestration, that is exactly what our program is geared to understand that so we don't end up with a problem.

Mr. SIMPSON. Well, as I said, I don't ask these questions because I am opposed to coal or I am opposed to removals or anything else. In fact, I am very supportive of them and I realize they are going to be part of our future. But we have to understand that there are implications by the increased use of coal technology, by the increased use of solar, by the increased use of batteries and other types of things, that we are going to have to deal with in the future.

I hope that the department and people within the federal government are thinking about what this is going to be in 20 years or 50 years, and what is this committee doing at that point in time, which by then maybe I will retire, what are they going to be dealing with in trying to clean some of this up.

So I appreciate your testimony today and I look forward to working with you on these issues. Certainly, I don't have the answers, and you guys are the experts. So maybe we can sit down and talk about this one of these days. I appreciate it. Thank you.

Mr. VISCLOSKY. I am going to recognize Mr. Rehberg in just one moment, but I would want to follow on on the issue of research, and indicate that the subcommittee has certainly shown strong support for research under the GenIV program as far as looking ahead to that long-term future.

Secondly, for the record, because Mr. Simpson has talked about a number of waste issues we deal with on the nuclear side and you talked about coal ash. We have had a lot of discussion about battery development, but there are waste streams that we are spend-

ing billions of dollars every year through this subcommittee cleaning up.

Mr. Karsner, would you be most appropriate for this? If you could for the record indicate what the department is doing as far as looking at what do we do with the waste stream? How do you recycle those? Not long ago, I could always take my flashlight batteries to a transfer station, and now they won't accept them. And so I assume they are in a solid waste dump now.

RECYCLING BATTERY WASTE STREAMS

The Department of Energy is not involved in the recycling of standard consumer alkaline batteries, but can speak to the recycling of hybrid vehicle batteries. Today, nearly all batteries for hybrid vehicles are produced abroad and any waste streams generated during manufacturing are managed in those countries. Waste streams resulting from batteries manufactured in the U.S. and any future growth in domestic battery manufacturing will be managed by our strong environmental regulations.

Most hybrid vehicles manufactured to date are still on the road. Therefore, recycling of hybrid batteries has not been an issue. In the future, when these vehicles are retired in large numbers and new battery chemistries come on-line, the recycling infrastructure currently in place for both lithium ion and nickel metal hydride batteries will need to gradually expand. Because of the high value materials contained in these batteries and the mature auto dismantling/salvage industry, hybrid vehicle batteries will be recycled. In addition, recycling and disposal issues are considered in DOE's battery development program.

The final thing I would mention because the Secretary mentioned the lack of funding for EDER, our job would have been easier last year if the President had not been adamant that he would not sign a bill with one more penny than he asked for. This year looking ahead, if the President hadn't cut his proposal for funding water in this country by over $1 billion, so I just want to make sure that is clear.

Also, I do want to thank Mr. Rehberg for the jelly-bellies that are the original gourmet jelly bean. That is the second gift from the right-hand side of the dais.

Mr. RYAN. Mr. Chairman, do you have to report this as a gift? [Laughter.]

Mr. VISCLOSKY. Mr. Rehberg.

Mr. REHBERG. Mr. Chairman, you might notice that I have my side of the dais eating jerky that you have provided—protein—and I have your side eating sugars. We will get back in the majority one way or the other. [Laughter.]

You could have said our side needs to lose weight and your side doesn't. [Laughter.]

FUTUREGEN ALLIANCE

Gentlemen, the department entered into a partnership with the FutureGen Alliance. The partnership was 74–26. The department woke up one day and said, oh my gosh, we are behind schedule. Is the Alliance responsible for you being behind schedule? You are the senior partner. You control the schedule. You do the permitting. You do the siting.

Who is at fault here?

Mr. ALBRIGHT. We could point fingers all day, I guess. We were supposed to be partners. I am sure we bear some of the blame for delays. I am sure they bear some of the blame for delays. I would like to clarify one thing. We were not in charge of siting. That was

the Alliance's exclusive job. We were not in on their site selection. Specifically, we did not know until the time they announced.

Mr. REHBERG. Were there regulatory impediments to the site selection? Did they have to work with state legislators and state governments to get the permitting done before they could pick the site?

Mr. ALBRIGHT. They did.

Mr. REHBERG. Here is what I am getting at. It seems like you are not a particularly good partner. The best example of that is, I have been touting this project all over America and I don't have a dog in the fight because Montana, for one reason or another, wasn't smart enough to put in a proposal. It turns out they were pretty smart because a deal is not a deal with this administration.

And so what I have been touting is the fact that isn't it great that there is a public-private partnership. There is an alliance put together with a 501(c)(3) that says we as companies are going to put in money that we don't want to make a profit off of in this 501(c)(3), and we are going to share this technology with anyone and everyone. And then we go out and we talk to foreign countries who are not required to be partners with us, ask them for money, and then pull the plug.

So I guess my next question is, have any of those countries—because I went to China and I went to South Korea and talked to their governments and said you need to be a part of this alliance; you need to be a part of this partnership; this is real. The federal government is putting in a big share of it and companies in America, if you were going to be part of the global change of our environment, you need to be a part of it. And they said that they would.

Did any of them make pledges or financial donations to this effort?

Mr. ALBRIGHT. There were some pledges made. I don't know if there were ever any checks actually written. We have been in contact with the international community on the new direction. There has been very positive feedback. I would like to say one of the reasons we started negotiations in April in trying to renegotiate this contract is we were seeking to avoid exercising a clause in the agreement that would allow the government in June of 2008 to make a decision whether to go forward with the program.

The Alliance was allowed at any point to terminate their participation. The government was allowed only at given intervals, given points in time, and June of 2008 was out next one.

Mr. REHBERG. Are you aware of any foreign countries then saying, well, thanks for the deal, but now that you have changed the rules, we are not interested in doing business with you anymore?

Mr. ALBRIGHT. No, sir, I am not aware of that.

Mr. REHBERG. Okay. You say the administration made the decision to pull the plug because of escalating costs. A number of us are involved in the construction industry, so we are well aware of costs. What has the alliance done to cause that cost increase?

Mr. ALBRIGHT. As I said earlier, I don't think there was any mismanagement. I don't think there were any problems that drove the costs.

Mr. REHBERG. Other than steel.

Mr. ALBRIGHT. I beg your pardon?

Mr. REHBERG. Other than steel.

Mr. ALBRIGHT. I learned the error of my ways on that. [Laughter.]

Mr. REHBERG. Then the question becomes, if you made the decision to cancel the project based upon escalating costs, how can the administration with a straight face come in and support the continuation of a MOX facility that has exactly the same problem?

Mr. ALBRIGHT. For a number of reasons. One, the MOX facility doesn't currently have the kind of alternatives that we have with FutureGen.

Mr. REHBERG. Okay. Then I guess I would ask, do you expect under your reconfigured new management plan that the various facilities or companies that are going to come in and want to do business with you are going to set up the same kind of a 501(c)(3) where they are going to be willing to share the technology with foreign countries?

Mr. ALBRIGHT. We hope the technology——

Mr. REHBERG. You hope? You have no knowledge. Again, read The Wall Street Journal because there are countries that are now saying because of your decision, we don't want to do business with America. We can get you that article if you want.

I also quote my former chairman, Mr. Hobson, and if I am misquoting I know you will correct me, but one of the reasons as I traveled through France with the chairman learning about was happening in Europe as far as the nuclear industry, was that there were not all these differing technologies out there; that they recognized one technology and kind of got in behind it as a country of companies. The difficulty in America is that there were competing technologies.

As a result, I carried that forward to FutureGen and suggested, isn't it great that we have the alliance of companies working with the government, to have a technology that can be duplicable or replicable around the country. And you have just blown that entire theory right to smithereens.

Mr. ALBRIGHT. I hope not, congressman. And let me say——

FUTUREGEN ALLIANCE

Mr. REHBERG. Well, you are experimenting at a time when we need to get these facilities in place. In relation to what Mr. Calvert said, we can't get a plant built. You can't anyhow. You have proven that. But we can't in Montana because our governor says, yes, we would love to have a new coal-fired generating plant in Highwood, Montana, but you can't build it until you have sequestration proven.

Mr. ALBRIGHT. That is exactly what we are trying to do. That is the portion that we are focusing on.

Mr. REHBERG. But by changing directions within the administration, you have set us back a minimum of 5 and probably 10 or 15 years.

Mr. ALBRIGHT. We have advanced the goal. We have advanced the time because we do not believe that the other project was economically sustainable. We believe that Congress would have cut the funds off, just as they did with the super-collider in Texas, and you would be left with a hole in the ground. You would be left with

the people of Mattoon, Illinois with no jobs, with lots of responsibilities financial and otherwise, expectations raised, with the inability to go forward. I specifically did not think that was the right choice.

Let me say, this was a tough decision. I have made a lot of decisions throughout my career and obviously personal life. This was as hard as they get. There is not cut-and-dried answer.

Mr. REHBERG. Well, unfortunately I find it a little disingenuous you blame the alliance at all for not coming to the table and sitting down and trying to cut a deal with you, because I wouldn't. I hope they have learned their lesson that they ought not do business with you in the future, but they have to because you are the agency they have to work with. The true guide will be whether these foreign countries are willing to do business with you anymore, and I frankly think they won't.

Mr. ALBRIGHT. Congressman, a good friend of mine likes to use the expression that even the thinnest pancake has two sides. I can assure you that there are two sides to this debate and discussion.

Mr. VISCLOSKY. Mr. Ryan?

Mr. RYAN. Thank you, Mr. Chairman.

SEQUESTRATION

I am going to bounce around a little bit. First, with just a couple of comments on the sequestration. This is something that we have an opportunity in Ohio, along the Ohio River, with economic impact in Pennsylvania, West Virginia, Ohio, a major regional coal-to-liquid facility, but the sequestration again is vital.

So as we hear all these debates on TV about the downside of globalization, the downside of NAFTA in areas like mine and probably several others members—I know Gary, Indiana as well—who have suffered from globalization. This is a real opportunity for us to use our geographic location to try to stimulate our local economy and this is a key component of it. So I just want to support what my colleagues have said.

BATTERY R&D

I know the issue of batteries has been brought up here as well. I want to ask a question with regard to that. Some of the products that are brought in to make these batteries, that obviously we don't have in supply here in the U.S. What factor does that play in the development of the lithium battery?

Mr. KARSNER. At this juncture, not a significant factor because we don't have a significant manufacturing industry. But to the extent that we emphasize the need to build one, and I hope that we do, largely the submaterials, the materials that would be supplied come from nations that are more friendly and aligned with our interests than other dependencies that we have. Countries like Chile and Argentina are principal suppliers of lithium, by way of example.

So on a commoditized basis in a global world, getting access to lithium, if we were to cultivate a robust industry here at home, the access to lithium would not be the priority problem, tradable with friends and allies. The bigger problem is the race to create that industry that has some demand on it because the longer we wait to do it, and the more robust our competitors are, the more they will

have priority call on those global resources, and these things will be going to Japan and China and Korea, and we will be a second-hand customer.

Mr. RYAN. Do you think we are doing enough on the governmental side to encourage development of this product?

Mr. KARSNER. We are——

Mr. RYAN. What are we investing? Are we investing?

Mr. KARSNER. We are invested predominantly in the long-term research and development of the product to make it more durable.

Mr. RYAN. How much?

Mr. KARSNER. I could get you the exact figure, but approximately $50 million from our portfolio. There is a robust storage investment from the basic science portfolio. So the answer is yes, we are doing an enormous amount, a world-leading amount in terms of the research and development of it. We are probably not fulfilling our interest for the commercialization, deployment and manufacturing piece of it.

Mr. RYAN. What do we need to do to encourage that?

Mr. KARSNER. Well, we have tools on the books. We discussed earlier——

Mr. RYAN. I am sorry I missed it. I had another hearing.

Mr. KARSNER [continuing]. That loan guarantees were specifically developed for commercialization of technologies such as these, that could avoid, sequester and reduce greenhouse gases. Our portfolio will be eligible for approximately $10 billion of those loan guarantees as they stand up, and we will be advising the loan guarantee program that storage is a priority area.

Mr. RYAN. For the battery component?

Mr. KARSNER. For both batteries for transportation and storage for the grid.

Mr. RYAN. So you think that will stimulate the commercialization and speed it up? What is your projection? How long?

Mr. KARSNER. There is simply no question that in a global world, as you have characterized it, we have to be in a competitive position to make a favorable investment environment for a market with too few players that possess this technology; too few investment dollars; and ultimately a captive market—in other words, the automotive industry.

So what are we doing on the private sector side to ensure that we have a good, reliable, long-term customer with healthy balance sheets in the automotive sector that can take off these batteries reliably? And what are we doing as a government—local, state and national—to assure that it is more attractive to get your returns in the United States?

On both those counts, today we are not in as competitive a position as the Europeans or the Asians. So I think the things that we have in statute are powerful, and as we stand them up, hopefully they will be favorable, but the irony we have today is as leading investors in the R&D, many of these companies are American and are more quickly seeking their commercialization deployment opportunities in other investment environments abroad.

WIND POWER

Mr. RYAN. Just to switch gears a little bit. I know we have—and you mentioned Hawaii where there are the high-wind areas for wind power. There are a lot of areas in the country that have moderate wind power. Are we designating any resources or earmarking—that is not a popular word anymore—but earmarking any money for development of these moderate windmills or windmills that would develop some power in some moderate wind areas?

Mr. KARSNER. That has been an interesting dialogue—even in our shop, in our national laboratories—among those who favor increasing the focus on the capacity to harness lower wind speeds. To some degree, we have tried to move our wind program to be far more relevant to the marketplace. You know, wind is the fastest-growing source of energy and new capacity additions, not just in our country, but worldwide.

So we have to say, who is the customer that is moving it? It is not the federal research scientist and what we would like to do, or a select community project with a low wind speed resource. The customer is the developer that is deploying these at larger rates and scales every year. That customer in the marketplace is finding more rational ways to harness the high wind speeds, which yield a far lower and more competitive price for the wind based on all the R&D that we have invested over 30 years.

So our strategy has been more about size and scale and co-location with the already available good resource, selected by the private sector, and then giving them pathways to the marketplace through our work with Kevin's shop in the Office of Electricity. We need, as he put in his testimony, wires. It is a transmission discussion. How do we get the high yielding wind spaces into the urban load centers?

There is a market for lower speeds, but it is very small and incremental relative to these national objectives of wind taking increasingly large parts of an emission-free portfolio.

DESALINATION

Mr. RYAN. Thank you.

Finally, if we are going to try all the bases, desalination. What are you guys doing with regard to investment into the research for desalination?

Mr. KARSNER. Regrettably, not a great deal.

Mr. RYAN. That answers it, I think. [Laughter.]

Mr. KARSNER. Yes, not a great deal. Because desalinization is so energy intensive, we do some of the front-end power consumption, which would be where our nexus would be to desalinization. But desalinization technology itself, reverse osmosis and conversion are not in our portfolio.

Mr. VISCLOSKY. Mr. Fattah.

Mr. FATTAH. Thank you, Mr. Chairman.

EISA ENERGY EFFICIENCY BLOCK GRANT PROGRAM

The Energy Independence and Security Act that was just passed by the Congress had as part of it an energy efficiency block grant

program authorized $2 billion to help local communities focus in on energy efficiency and conservation efforts.

I would be interested in how you view—how that program, in your mind, should be rolled out or implemented. What should be the appropriate first steps along that road?

Mr. KARSNER. Well, yes, sir. I mean, obviously, the timing presents far too much of a challenge for the 2009 budget request. But I think the onus of your question is how would you rationally begin a dialogue to say this should be stood up correctly in the first place when it is budgeted.

And I think that that is probably a dialogue with the appropriate associations and representatives of counties and cities and those councils. I think you would want to be careful to optimize that volume of money which is, as it is described in statute, another formulaic grant program.

You would want to be able to guide that to useful metrics that are measurable and serve the purpose on the first day that such a program were funded. But as I said, as the EISA was signed in mid-December, it did not factor into our thinking.

Mr. FATTAH. You said that if the Congress decides to make some down payment in this regard to begin this program, you think that one of the steps is to work with the stakeholders involved. But from the department's viewpoint, your sense of the utility of an incremental beginning in this regard, in terms of which of the various priorities would you think would be the appropriate focus?

Mr. KARSNER. Well, I mean, I think that is the problem. That is the challenge with formulaic grant programs managed through the federal government in general. Fundamentally, we are an ATM machine when we have that type of statute. So you fund us, we apply the formula, and we distribute it without many milestones or metrics or enforcement.

So for us to add the value of best practices and reconciling the history and experience of the department, our national labs and what we could bring to bear, there would need to be some sort of a stimulus response mechanism and interrelationship.

This is precisely the discussion we have on the formulaic grants. It is how to make them more agile and, to some degree, get some competitiveness amongst the stakeholders to apply best practices that we can then reconcile and convene the stakeholders to so that the whole moves up.

Mr. FATTAH. If we decide to proceed in some form on this program, are you confident that the process that you would prefer could be short-streamed in a way in which we could get some utility in this regard?

Mr. KARSNER. If the will of Congress were to move forward on that, I would be happy to have all of our resources at disposal to convene with your office or other interested parties to say, Is there a way to optimize federal best practices involved with that?

Mr. FATTAH. Thank you very much.

Thank you, Mr. Chairman.

Mr. VISCLOSKY. Mr. Serrano.

Mr. SERRANO. I apologize for the fact that I join you at this time, but I was chairing my own hearing down the hallway with the Consumer Product Safety Commission.

WEATHERIZATION

I understand that Mr. Olver, gentlemen, touched on the issue of weatherization, and I wanted just to follow up. Even if you assume that the weatherization program is an awkward fit in DOE, this budget does not propose moving it to another agency. It simply proposes eliminating it.

When you combine that with the proposed decrease in LIHEAP in the HHS budget, one has to wonder how low-income Americans are supposed to pay their energy bills next winter. It seems like the administration simply has no interest in helping those who need the most help.

Now, I have to tell you that I have taken a bit of heat—and that is a terrible pun—in my congressional district for accepting an agreement with CITGO that, as you know, is providing a lot of home heating oil at a 40 percent discount. Many people see it as some sort of incredible propaganda move by President Chavez from Venezuela.

But I say that because my district is a living example of what happens when folks have trouble paying their bill at the end of the year. And what can you tell us? I mean, is there an indifference to this issue? Is there a desire, perhaps, to remedy this later on? To tell us that it doesn't fit within DOE may be a technical answer, but it certainly doesn't help Mr. Smith's problems next winter.

Mr. KARSNER. Congressman, I think you are asking precisely the right question, and one that is asked all too rarely. How do you fix this problem? Because this has been a yo-yo question year after year after year, based on the metrics of competing this particular program against all the other programs with higher returns.

So the question about a consolidation of income-related federal weatherization assistance is the important question, and it is a statutory question, because the provisions for this particular program, unlike many others, are embedded in the law from which it has arisen.

Therefore, it does require a hands-on approach by Congress across multiple committees to determine how a consolidation would best occur to more effectively deliver without having to compete it in this particular portfolio where, as you point out, it is, in fact, awkward.

We would be happy to consult with that in any way. We have offered HHS and across all agencies any technical assistance, any technology provisions, those core strengths of the department, to continue in perpetuity to assure that they are getting what our strength is, the technology focus. But in terms of the delivery mechanism, that is a statutory fix, and it requires multiple committees to consult, and probably on both sides—probably on the Senate and the House side. I am not an expert in such things.

But our focus would be just as you outlined it—how do you make this an effective and efficient delivery mechanism not just for the 88,000 homes that get it each year, but for the 27 million homes that are eligible for it each year?

So we have that delta. We are not fixing it. We are doing policy by placebo when we talk about it each year as to how it competes

in this portfolio. We would be happy to work with your office if you think a consolidation move is in the interest.

Mr. SERRANO. I appreciate that. At the expense of having to repeat yourself because of my earlier lack of presence in the committee, why is it an awkward fit within DOE?

Mr. KARSNER. Well, I think there are multiple reasons, you know. The first and obvious thing to say is we have been asked several times in this committee about redundancy across the federal government and how to be more streamlined and efficient in our delivery.

Now, I understand the stakeholders in this are quite passionate, and they are doing good work, and I understand why they would want to hedge their bets across multiple pots and pools of money and keep it that way. But the first thing that is obviously asked by those people who command or review the budgets across the whole federal government is why do we have this in multiple places.

So the second thing would be to say what is the right place relative to mission. It stands that this is the only income-related assistance program in all of the Department of Energy's scientific, research, development and deployment portfolio. So it completely stands out in a way that we formulaically apply it and never get to any substantial percentage of those who are available for the help.

Mr. SERRANO. Well, I would hope, Mr. Chairman, that these gentlemen—you know, they have made the offer to work with us—that we could do that, because there are a whole host of issues in this country that still have not been resolved and that make us look bad in view of the wealth of our society, and one of them is that there are still folks in—a significant number of people who just don't know how they are going to pay their heating bill next year.

And I am not talking necessarily about the ones who will be hit by the economic downturn. That is going to be everybody in this room to a different extent. We are talking about folks that were never really able to get a handle on this issue.

Under weatherization, the government stepped in, and was able to do something. However, now it seems like more and more we are either consolidating or eliminating programs, and creating a serious problem. So I certainly stand ready to work on this, and I know that you will, too, Mr. Chairman. And I thank you.

Mr. VISCLOSKY. Mr. Rehberg.

Mr. REHBERG. Thank you, Mr. Chairman.

Very seldom do you have an out-and-out victory over the bureaucracy. Andy, thank you. Friday was his executive assistant's last day, and yesterday was her first day with me. So I stole her from you.

Mr. KARSNER. I cursed the day.

Mr. REHBERG. Yes, curse—you should have paid her more.

Mr. KARSNER. Yes. [Laughter.]

Or had her work less hours in preparation for the committee.

Mr. REHBERG. Yes, something like that. [Laughter.]

TRIBAL GRANT OPPORTUNITIES

And I know all about you. And my question is for you. It is a very quick one, and that is the Karok tribe in northern California was a successful grantee and entered into a partnership with your department for a First Steps grant. It was a pretty exciting opportunity for them, because they came up with a plan, and the plan was a small hydro and solar project, and there were, lo and behold, that partnership kind of ended as well.

I have gone back to my prior discussion. And can you explain why now Wally Herger has to come in for an earmark, one of those dastardly things—and if we do what you are reading in the paper today it is not going to happen. Again, why do we enter into partnerships with the department when the rug is kind of pulled out from under us, especially in something as exciting, I think, as the First Steps grant program?

Mr. KARSNER. Does that fall under the tribal program?

Mr. REHBERG. Yes, it is tribal.

Mr. KARSNER. And I will report back for the record on that specific tribe and grant opportunity.

But in general, the tribal program is not unlike Mr. Serrano's questions on the weatherization, where incrementalism and very selected choice opportunities to the few who could interconnect with the federal government has been the guidance, instead of a more holistic national and measurable vision of saying these are all the tribal communities in need, these are all of their resources, this is the timeframe it takes to fix the problem.

And so that has been the difficulty. It is not that there is not virtue in the small amount of money that we give to the tribal programs or have over our history. And it is not that it doesn't do good work when it connects. It is that we need——

Mr. REHBERG. But isn't there kind of an inherent believed expectation of some kind of a follow-through on the part of the department when they enter into it? I mean, you know, this is time. This is effort. This is commitment.

Mr. KARSNER. Well, I mean, I can't speak to that one opportunity, and there may be that, and I will revert to that. But in general, those grants have their own definition of time. And so it should be understood when those grants are received whether there is a multiyear mortgage or whether it is a one-off opportunity. And so, I mean, that is almost an explicit contractual relationship.

Mr. REHBERG. Okay. If you could report back on that one specifically.

Mr. KARSNER. Yes, sir.

TRIBAL GRANT OPPORTUNITIES

In FY 2007, the Karuk Tribe of California applied for and was competitively awarded $98,120 under DOE's Tribal Energy Program's Funding Opportunity Announcement "First Steps Toward Renewable Energy and Energy Efficiency on Tribal Lands" to conduct an "Energy Analysis and Conservation on Karuk Trust Lands." The project started on September 30, 2007 and is scheduled to be completed by December 31, 2008. The agreement with the Karuk Tribe was for the "First Steps" project only, with no DOE contractual obligation for future funding except through a future competitive process.

Also in FY 2007, and for several prior years, DOE's Tribal Energy Program had issued a Funding Opportunity Announcement seeking feasibility studies from the Federally recognized Tribes and Alaska Native Corporations for renewable energy and energy efficiency projects. In FY 2008, DOE's Tribal Energy Program did not seek either "First Steps" nor feasibility studies project proposals from the Tribal community. Rather, the Tribal Energy Program has been refocused to (1) provide highly cost-shared financial support toward deploying renewable energy and energy efficiency systems "in the ground" in Alaska and the lower 48 states within 18 to 24 months and (2) develop model financial solutions, legal frameworks, and Tribal training to spur broader project development. The goal is to provide the knowledge, technical assistance and legal templates to spur greater project development through a more holistic national strategy for the Tribal community, rather than continue awards for feasibility studies to a limited number of applicants that result in very few actual projects.

Mr. REHBERG. Thank you, Mr. Chairman.

FUTUREGEN PROGRAM

Mr. VISCLOSKY. Thank you very much.

Mr. Secretary, we have had a number of questions on the FutureGen program, and I would also have a number of them. Could you, for us, describe your restructuring plan in a bit more detail? When do you expect, for example, the first clean coal plant to actually begin operations?

Mr. ALBRIGHT. We have put a request for information out to the public. We got in excess of 50 responses. We are analyzing the information that we got back. We will meet with interested parties who responded and those who didn't respond. We will be open to the public to get more information.

We hope to make a selection by the end of 2008 as to where—selecting the companies to build these facilities. I don't know exactly what the timeframe will be on completion of those.

Mr. VISCLOSKY. Do you have a ballpark year?

Mr. ALBRIGHT. Ballpark would be 2015.

Mr. VISCLOSKY. And what is going to be the federal cost share as to how the Program is going to be run?

Mr. ALBRIGHT. The way we are structuring this is the government, the federal government, is trying to structure it so that we pay the carbon capture and sequestration element of this. They build the plant. We pay for the portion that the private sector was unwilling to pay for, and that is the carbon capture and sequestration.

FUTUREGEN COST-SHARE

Mr. VISCLOSKY. So it will be 100 percent on the plant on the private side and 100 percent on the——

Mr. ALBRIGHT. Well, the plants will be eligible. It will be no additional federal involvement. They are already eligible for certain loan guarantees, tax credits, et cetera, potentially.

Mr. VISCLOSKY. Okay. Tax credits would be tax policy, and loan guarantees, I understand what those are about. Will there be any other federal monies they would be eligible for for the plants themselves that would be from programs under this committee's jurisdiction?

Mr. SLUTZ. We don't anticipate that. The plant would serve as a cost-share component against the CCS, so it would meet the dem-

onstration—the overall project would need to meet the demonstration requirements of at least a 50 percent cost share.

That is one of the challenges as we, or challenge/opportunities as we work through all the comments that we have received from industry, and many positive comments, is how to structure that cost share so it is—so we can get the most competitive and optimal bids, you know, when we get to the request for funding proposals stage.

Mr. VISCLOSKY. Under the demonstration, it is supposed to be 50–50, depending on each plant being somewhat unique and each of the capture and sequestration being somewhat unique. Is there a requirement in your solicitation that it be 50–50, or you are looking to be as close to 50–50 as possible? Is there a range as far as the cost share?

Mr. SLUTZ. The total value of the project would be—because part of it gets very technical in the details of what qualifies for various cost share. But I can kind of sketch out what we would envision as a potential proposal based on plants that industry has proposed—is it would be probably in the range of a 600-megawatt power plant, which would cost somewhere in the probably $2.5 billion-plus range.

We would be paying for the carbon capture and storage demonstrated on one 300-megawatt train of that power plant. And that would be—and we are working within the budget of $1.3 billion that was allocated for the FutureGen project.

We would anticipate being able to do multiple plants. Does that give you framework? And part of that is trying to understand—we have some estimates on cost, but because of the nature of where this is, those are fairly preliminary, and we need that feedback from industry.

Mr. VISCLOSKY. I understand there is some give here, but the concern I would have, and I think all of the members would, is that the proposal of FutureGen originally was 74–26, 76–24——

Mr. SLUTZ. I think 74 government, 26 industry.

Mr. VISCLOSKY. And we would want to know as we proceed here, given the comments that a number of members have made about the first go-around here, is to make sure we know what the values are on both sides of this transaction. If you could for the record, I would appreciate that very much.

FUTUREGEN COST SHARE

Under the original FutureGen approach, the Department was responsible for 74 percent of the total project cost, and industry was responsible for 26 percent. the restructured approach to FutureGen will limit the Department's expense to the incremental cost of carbon capture and storage (CCS). The allowable CCS-related costs will be defined when a new Funding Opportunity Announcement (FOA) is released in summer 2008. The costs incurred will vary based on the nature and extent of the proposals received, yet the Department will limit its cost contributions to only the CCS portion of the power plant, and to a maximum of 50% of the total project cost.

You will be getting solicitations—and I assume that also will be site-specific as far as the solicitations you receive. They will be for specific sites. Who picks the sites? That is my question.

Mr. ALBRIGHT. Private sector.

Mr. VISCLOSKY. So that will be similar to the original FutureGen program where——

Mr. ALBRIGHT. It will be.

Mr. VISCLOSKY [continuing]. The alliance picked the——

Mr. ALBRIGHT. It will be, except these will be commercially sited plants for commercial purposes.

Mr. VISCLOSKY. So part of their response to your solicitation is okay, we want to participate, we will build a plant, and we will build a plant in Montana.

Mr. ALBRIGHT. Correct. Correct. [Laughter.]

INTEGRATED GASIFICATION COMBINED CYCLE

Mr. VISCLOSKY. Right? I mean, that is the right answer.

The restructuring does seem to follow many of the suggestions made by the MIT report on coal published last year, in particular to build multiple clean coal demonstrations.

One observation—and Mr. Slutz probably this would be directed to you, that you did not take from the report—was not to pick winners when it comes to the power plant technology. What was the rationale in demanding that plants use integrated gasification combined cycle technology?

Mr. SLUTZ. You are talking about in our request for information?

Mr. VISCLOSKY. Yes.

Mr. SLUTZ. The program is written around, and we think the integrated gasification combined cycle has a clear role. We actually expanded when we requested, did the RFI, and again, we are still—understand that that closed last week, so the stack of, you know, comments, we are integrating through quite an extensive comment program.

But we did ask for a broader input on whether that was the right path, should we consider other paths. And so we are analyzing those. Just from the state of the technology, we think there is clearly a lot of interest and a lot of opportunity in IGCC.

Mr. VISCLOSKY. So it is not a given that it will be IGCC technology at each Plant. Is that still somewhat in question, if I understand your answer?

Mr. SLUTZ. We have received comments from industry around that issue, and we are working through those comments. That will be worked through before we go out with the formal request for proposal.

Mr. VISCLOSKY. So what is your answer?

Mr. SLUTZ. We haven't made a decision on that yet, but it is skewed toward IGCC.

Mr. VISCLOSKY. Secretary?

Mr. ALBRIGHT. We tried to leave it as open as we could. We wanted the private sector to give us information. If they have a better way to do this, we wanted to hear from them as to what they believe is a better way. We believe, given what we know, that IGCC is likely the technology that will be——

Mr. VISCLOSKY. So it is most likely we——

Mr. ALBRIGHT. Most likely.

Mr. VISCLOSKY [continuing]. Might see that, but it is not a certainty.

Mr. ALBRIGHT. We did not try to lock the private sector into what the government says you must do. We tried to leave it as open as possible. They have massive amounts of information and technological and commercial expertise, some of which we have, some of which we don't have.

The commercial application is what we are really looking for here, and that is a huge part of the difference between the research facility and commercial application. We are trying to get to the end point.

Whereas the earlier research, the commercial ventures, would have been able to pick and choose what they wanted out of this research facility, we are now saying we will pay for a large portion of this; you tell us what you want to do, what is commercially feasible.

UNDERGROUND STORAGE OF CARBON DIOXIDE

Mr. VISCLOSKY. Okay. The underground storage of carbon dioxide emissions will be a key component of the proposed projects. And in particular, the Department intends to provide support for building and operation of a storage system.

The Department is also supporting several such large-scale tests of underground storage as part of the regional carbon sequestration partnerships over the next few years. It would seem as though it is a duplication. And what is the rationale of the Department for supporting both large-scale tests and the carbon storage of FutureGen plants?

Mr. ALBRIGHT. We have announced that we will have seven carbon sequestration partnerships around the country. We hope that each of those will demonstrate the unique needs of various geographic areas.

Specific testing will go on at those unique geographic areas. There is nothing that precludes the FutureGen project from collaborating with the seven partnerships. We hope that we will learn from both the sequestration partnerships and from FutureGen.

Mr. VISCLOSKY. In a sense, what is your coordination role? Do you propose FutureGen be filling in less speculative sites? Would that be the right question?

Mr. SLUTZ. I think—sorry.

Mr. ALBRIGHT. No, no, go ahead.

Mr. SLUTZ. Really, you have to look at——

Mr. VISCLOSKY. I just want to make sure we are not doing two——

Mr. SLUTZ. No, no, no, but you——

Mr. VISCLOSKY [continuing]. Tracks that never meet.

Mr. SLUTZ. It is a very good question. And because as we look, the whole coal—it is not just the partnerships and that, but how do you integrate the whole coal research portfolio, what you do, and then the higher level, how do you research the Department's portfolio. But the sequestration partnerships are under way right now. They have completed small-scale tests. We have actually approved four of them to move forward with large-scale tests.

We actually have some detailed—and they are doing data acquisition in the first year of that. The other three will be moving forward, we anticipate, later this year. But those are on a scale that

we will begin those very soon, okay? And we need to get that information very quickly.

One thing that is very—FutureGen integrates that all together, and you have to have that integration. And remember, we will be working the next few years on getting the—you know, we make the selections later this year. But we are looking at 2015 for a commercially operating FutureGen, the first of the FutureGen plants if they were starting from ground zero versus ones already on the drawing board. So from a time scale, the partnerships are working now. We will bring in significant information that will be used to set the regulatory structure. And then these FutureGen plants will come in after that with the integrated system. So it really is a complementary system.

Mr. VISCLOSKY. So you would build on the knowledge you want to gain from the partnership in a sense, although a lot of this will be concurrent as well as you proceed.

Mr. SLUTZ. Yes. They will be operating concurrently, but for instance, injection in the large-scope partnerships are probably a year away. You are looking several years before you get the FutureGen plant operating on an integrated scale.

FUTUREGEN SITE SELECTION

Mr. VISCLOSKY. Okay. A substantial amount of time, money and effort have gone into the site selection process for FutureGen and, in particular, to environmental impact assessments at the final four sites considered.

And in particular, the site at Mattoon, Illinois. Are there any plans by the Department to try to make sure that these efforts don't go to waste? For example, has the Department pursued coordination of the efforts made at those sites with the regional partnership program?

Mr. ALBRIGHT. We have put in our requests for information, and we will continue to work on having companies look specifically at those areas that have done the kind of work that was done in Mattoon. We have encouraged both in writing in the RFI and also just verbally, to try and pay particular attention to those areas. I think they have addressed the liability.

There are studies that have been done on the suitability of the sites, that should perhaps not be directly on a one-for-one basis. They can't just flip it and apply it to a new project. But they should save significant amounts of time and engineering effort that would have to go into a site.

That is kind of a long answer to saying yes, we have worked and we will continue to work with the private sector. We believe that that work that has been done on those sites will not go for naught. But again, that is going to be left to the private sector to make that determination.

OFFICE OF FOSSIL ENERGY

Mr. VISCLOSKY. Gentlemen, one thing—and Mr. Rehberg is here, and Mr. Serrano—we have, I guess, one vote. And apparently we have to be out of here at 1:15 p.m., which I just found out about.

But I have just scratched the surface, and as a courtesy I have waited to last. So if I could continue for a few more minutes on fos-

sil, I will run to vote, and if we could just come back as quickly as possible, and squeeze as much as we can, I would really appreciate that.

FOSSIL ENERGY

Mr. Secretary, I do notice that the Department does not seem, as far as their appointments to the Fossil Energy program—a serious commitment. There is today no Assistant Secretary. And with all due respect to Mr. Slutz, who is acting, there is no permanent Principal Deputy for Fossil Energy. And those are two of the top positions.

With the lack of permanent personnel at these top two positions, what are we to infer as far as the administration's commitment to fossil?

Mr. ALBRIGHT. I am not sure what you should infer. I can tell you what you should not infer that there is a lack of commitment. I think the budget certainly shows that, if nothing else.

Let me take a second to compliment Jim on the work he has done. He has been willing to serve in this position and has done an exemplary job of leading the team, working very, very hard on some of the most difficult and vexing issues.

As you know, we had a nominee for assistant secretary who withdrew his name just a few weeks ago. We are trying to see what we do in light of that. There is no lack of commitment. There is no lack of time, energy and effort that is going into ensuring that we are fully staffed in that shop. It is just the cold reality of this stage in the administration it is hard to get people to fill positions for a few——

Mr. VISCLOSKY. Mr. Slutz.

Mr. SLUTZ. I am going to do the best job I can.

Mr. ALBRIGHT. He is doing a great job.

Mr. VISCLOSKY. That all we can do, you know?

Mr. ALBRIGHT. He is doing a great job.

Mr. VISCLOSKY [continuing]. A struggle every day.

But along that same line, the Office of Fossil Energy is a federal steward for underground geological storage of carbon dioxide and is expected to be critical to our efforts to avoid global warming. I am told that the underground storage may be critical for management of carbon dioxide emissions not only for coal-fired plants but also to store emissions from a range of sources, including ethanol plants and future natural gas power plants.

But I was looking at the organizational chart and I do not know—and I stand to be corrected—if it is a man or a woman who is the Director of the Office of Sequestration for—I shouldn't say that. The person who runs the program reports to the Office of Sequestration and Hydrogen Clean Coal Fuels, is that correct?

Mr. SLUTZ. Are you looking at an ACL chart?

Mr. VISCLOSKY. No.

Mr. SLUTZ. I am sorry. I am not sure what chart—Dr. Victor Der—oh, Lowell Miller. And Lowell works for Victor Der.

Mr. VISCLOSKY. Okay. And so Mr. Miller is in charge. He is in charge.

Mr. SLUTZ. Of the sequestration——

Mr. VISCLOSKY [continuing]. Of sequestration.

Mr. SLUTZ. He is a Director. And then our Deputy Assistant Secretary for the Clean Coal Program is——

Mr. VISCLOSKY. Okay, and then that reports to——

Mr. SLUTZ. And he reports to me.

Mr. VISCLOSKY. Reports to you. Okay.

Mr. SLUTZ. And then that is implemented out to the National Energy Technology Laboratory.

Mr. VISCLOSKY. Okay.

I am going to defer on fossil for a moment here and get to biofuel, Mr. Karsner, if I could.

You know, I think let's run and we will be right back.

[Recess.]

$CO_2$ EMISSIONS FROM BIOFUELS

Mr. VISCLOSKY. The Committee will come to order, and I do appreciate, gentlemen, your patience with us here.

BIOFUEL

Mr. Karsner, a key challenge to increasing biofuel production is making biofuels cost competitive with petroleum-based transportation fuels, so we have had a fair amount of conversations about them today.

FEEDSTOCKS AND $CO_2$ EMISSIONS

I have a couple of questions . When you compare feedstocks, will some produce more or less $CO_2$ than others, taking into consideration the full production life cycle?

And I don't want to be rude, but obviously we have got a couple—and they told us literally we have got like 21 minutes here. It is not my idea, let me tell you.

Mr. KARSNER. The question is that——

Mr. VISCLOSKY. But in all of these, if you would want to expand for the record, I would deeply appreciate that, if you could.

Mr. KARSNER. Okay. We will do that. That is a complex question. The short answer is yes, different feedstocks will have different life cycle characteristics and greenhouse gas emission profiles.

All of them, depending on the energy intensity of the production and conversion, are going to be a greenhouse gas reduction relative to the conventional carbon-based fossil fuels or the petroleum fuels that they are displacing.

Mr. VISCLOSKY. Okay. And if I could, as far as the matrix—how the Department, when they are doing research, and depending how things develop, deciding which road to go down—how do you balance your choices between feedstocks that may produce significant energy, but yield significant $CO_2$ emissions with those that may produce less energy but have less $CO_2$ emissions?

Because as you had mentioned a couple times, and I agree with you, you know, this is a national security problem. This is an economic problem. This is environmental. How does the department think about these things?

Mr. KARSNER. To some degree, we still remain somewhat agnostic on the feedstock itself. Of course, the Department's historic core

strength is in the conversion technology, the conversion platform, rather than the inputs.

As we get closer to the targets for commercialization and our funding of these commercialization plants, we have to be into feedstock inputs. But in all cases, those feedstocks and these conversions yield a better climate change profile than what they are displacing. So there is a lot of analysis right now on the sustainability, on the climate change profile, of the various forms of biofuels.

It is important to put it in context against what it is displacing, first off. And then both conversion technologies and feedstocks progressively yield different profiles. What we want to do is to be as diverse in our investments as possible so——

Mr. VISCLOSKY. At the front end.

Mr. KARSNER. At the front end, so different regions, different feedstocks, as many different feedstocks as we can accommodate and understand the attributes of, which right now is fairly rudimentary. In other words, running sweet sorghum, or switchgrass, or urban green waste or agricultural waste—we are in a learning process right now.

But all different regions of the country have biomass that is capable of being utilized for cellulosic conversion, and so our challenge is thinking of our energy sources on a far more distributed basis than the concentrated base we have today in the Gulf region or Alaska, and then piped everywhere.

Mr. VISCLOSKY. Is the emphasis on the substitution? And is $CO_2$ secondary?

Mr. KARSNER. I think that it is fair to say that the emphasis is on breaking the addiction to oil and displacing oil first and foremost, and that we know, no matter what, depending on the energy intensity in, that the environmental profile should be better. So it is all about, then, improving that environmental profile as we improve the process.

Mr. VISCLOSKY. You are agnostic at the beginning. For example, we funded these programs in 2007 and 2008. From what you have learned in just, say, 2007 to beginning of 2008, although we are almost halfway through the year now, and recognizing you develop your budgets much earlier, let me go back to 2005, 2006.

Has that changed? Has your funding signature changed as far as how you are approaching feedstock for the 2009 request? As you have learned, has that adjusted where you are putting——

Mr. KARSNER. I think it is fair to say we have progressively gotten far more into feedstocks than we were 24 months ago. We don't want needless overlap with the USDA, and so we do a joint funding, joint program with them on several aspects of it. We have moved far more into sustainability, space of direct and indirect land use of the feedstocks, the impacts of nitrates and phosphates in water runoff, et cetera. Those are inevitable things that will increase our focus.

The bundling, the handling, the single versus double pass harvesters, we have to focus on the feedstock equation as we get closer to commercialization on the conversion platforms. We had one of our cellulosic winners in yesterday who identified, not like many

other places in the sector, feedstock management as being his number one commercial risk.

Mr. VISCLOSKY. Okay.

STRATEGIC PETROLEUM RESERVE

Secretary, we have not talked a lot about the Strategic Petroleum Reserve, but essentially, the capacity right now is about 727 million barrels. The proposal is to go up to 1.5 billion, as I understand it.

With the price of oil hitting $100 a barrel, and apparently Guy Caruso, the head of the Energy Information Administration, indicated last week in testimony that this was likely to be the high, although I don't think anybody is speaking of a certainty here, what is the rationale for the expansion beyond the authorized levels now?

Mr. ALBRIGHT. Well, the president has determined that we need, for strategic reasons, a 90-day supply of oil. That would be about a 1.5 billion fill. At the current fill, I think we have about a 57-, 53-, somewhere in that range, day supply. Get to a million, we will be at about a 60-day supply.

As to Mr. Caruso's comments, I hope he didn't try to predict that this is the all-time high. I thought that at $60, and then at $70, and then at $80. But we do know that historically prices have gone up during switch-over periods and during the summer.

Due to reduced efficiencies in the burn of the fuel, you need more oil in the summer time for an equal amount of energy.

Mr. VISCLOSKY. But as far as the facility and then the purchase of the oil, What is the estimated overall cost to get to 1.5 billion?

Mr. ALBRIGHT. I will be happy to try and get that for you. I don't know.

Do you know that?

Mr. SLUTZ. Well, you know, I can give it to you in round numbers, and then we can—but to move to the billion level, the total cost of it is around $5 billion. Then to move to the 1.5, it is another $5 billion cost.

Mr. VISCLOSKY. I would understand that it is—oh, you were talking about construction?

Mr. SLUTZ. Construction costs.

Mr. VISCLOSKY. Construction. Okay.

Mr. SLUTZ. That does not include acquisition of the oil.

Mr. VISCLOSKY. Okay. I am told that that potentially could be 45, 55—and of course, obviously, it is completely dependent upon what the price is, too.

Offering some context for my question, if you would, assume $10 billion in construction costs, which is not an inconsequential sum of money, and then the add-on for the oil—Mr. Karsner's budget for this year is $1.7 billion, give or take, and the request is a bit over $1.2 billion, $1.3 billion.

If we invested that—I will throw out—say $50 billion over the next 19 years in renewable technologies and alternative fuels and conservation, could we make up that 750 million barrels? I mean, I am dividing 1.7 into $50 billion and thinking, I am getting a lot of renewable research and conservation and other efforts. Could I just replace those barrels without building the——

Mr. ALBRIGHT. I think we probably need to do both. Certainly, again, the president has made a determination that our strategic interest is served by having a 90-day supply, and that is what we are building toward. I don't think that is coming at the expense of our advancement of renewable and efficiency technology that we are working on.

I might add that when we do our purchases for the fills, we do make an economic analysis of whether or not, given the price at the time, given the contracts that we can possibly get, we make the purchase. We have not made the last two purchases because we didn't feel that they were economically viable. Now, again, that is not to look 6 months down the road, but it is to say given what we know today.

HIGH TEMPERATURE SUPERCONDUCTIVITY PROGRAM

Mr. VISCLOSKY. Mr. Kolevar, I do not want to ignore you, because my son just got back from his visit to Ann Arbor 2 weeks ago, so I don't want to leave you in the lurch. Sorry about that day.

Mr. KOLEVAR. Good choice.

Mr. VISCLOSKY. The high temperature superconductivity program has focused on high-performance conductor wires with 100 times capacity than conventional copper wires. Would you explain some of the new attributes? And are the new conductor wires available on the markets? And if not, when will they be deployed?

Mr. KOLEVAR. Right, so you have two different wires in the marketplace. You have 1G wire. You have 2G wire. The superconducting lines are really flat tape, superconducting materials sandwiched between metals—silver in the case of 1G wire, nickel in the case of 2G wire.

And while we have 1G wire in demonstration now, I think we are looking at I believe Albany, the Albany project, coming up is a 2G wire cable demonstration. We think 2G ultimately holds the prospect of much lower costs, if not because of the further advancements in materials research, if for no other reason than the cost difference in precious metals that go into the wire itself. But we have seen significant progress on the wire side in the high temperature superconductivity program.

When I first came into this job 3 years ago, I considered the HTS program to be about a mid- to perhaps a long-range type of R&D program. And I have revised it upwards in the last couple of years based on the penetration that we are starting to see.

Mr. VISCLOSKY. The new wires, if you would, have an attribute of being able to move more electricity, and is it more efficiently? Do you lose less power on those wires as well, then, or——

Mr. KOLEVAR. I would have to go back and look. I am not aware that you lose power in the 2G lines. My understanding is that the attributes principally are greater capacity to move it and, just as important, a much potentially less expensive wire.

Mr. VISCLOSKY. And you don't have to go through the process of having to find new corridors, because you are essentially rewiring existing corridors, as I understand it.

Mr. KOLEVAR. Yes. Really, when you are talking about HTS wires, I think you are talking mostly about some transmission, but a lot of urban distribution.

Mr. VISCLOSKY. Okay.

Mr. KOLEVAR. So in cities like New York City and other large cities where you are utilizing, say, underground pipelines.

Mr. VISCLOSKY. Okay. I am corrected.

Mr. Olver had a couple of comments.

Mr. OLVER. Thank you, Mr. Chairman.

SUPERCONDUCTIVITY

You started on the superconductivity. And, Mr. Kolevar, you are talking about the wires. Well, that gets you back into resistance, because the superconductivity isn't going to be maintained in these cheaper wires. Superconductivity does have the opportunity, I think, to reduce a huge amount of long-range loss, transmission loss, and ought to have some—I don't know enough about this as I ought to, so I am not sure whether I am really on target here.

But I was going to ask you how much of your relatively small budget—it is only $134 million or so—goes into the issue of superconductivity, because I think there is a major opportunity in transmission loss, which is very, very significant in our major lines.

Mr. KOLEVAR. For fiscal year 2009, we propose $28.3 million in R&D for the——

Mr. OLVER. In the superconductivity portion.

Mr. KOLEVAR. And I will say that there are certainly going to be transmission size applications for high temperature superconducting wire in the future. Most of the work that we are seeing now is smaller scale. The longest lines that we are really looking to put in place right now, with 300 meters or so in Albany and longer in New Orleans. And given the cost of coolant along those lines, I think long-distance transmission for HTS is something that is far off in the future. But that should in no way diminish the significance of this application in an urban setting to really allow for much more effective flows of electricity.

OFFICE OF FOSSIL ENERGY

Mr. OLVER. Okay. I wanted to give something to Mr. Slutz over there.

You don't have fusion in your bailiwick. Maybe you are quite happy not to have fusion in your bailiwick. But there is a nuclear process which I think is in the science program because it has never quite reached the development level, whereas everything else that you guys talk about is basically research and development.

Your proposed budget is a couple hundred million dollars above what it has been, and there are at least a body of people who think that if one were to spend perhaps $1 billion a year, per year, for, a period of years, we might finally break through.

There remains that holy grail, essentially, because both the volume and the intensity of the waste that you produce in fusion, at least as best we know about it, is so much less than it is in the case of fission nuclear processes.

So there may be some place in the future to ramp upward the amount that is being expensed so—at the level it has been, you expend a couple hundred million dollars a year, as has been the case now for a lot of years, and you make very little progress along the

way. It needs a certain, really, scale to that research program to get there, I think.

CELLULOSIC ETHANOL

A third comment that I wanted to make, on the cellulosic ethanol, I have had scientists come to me and say, please do not close avenues that are available. We have operated on corn ethanol, and we are now moving toward cellulosic ethanol, and both of those depend upon the breakdown to the ethanol, which in corn is relatively easy, but still takes a lot of energy.

In the case of cellulosic, either you are working on a sequence of biological events that get you down to the ethanol, or there are those who now think they have a closure of that to just one or two steps that get you down to that point. One or two steps, if they prove to be relatively effective, would seem to be a good deal better than going the other, but there are others.

This group of scientists I speak of has come in saying we can take the very same feedstock that is being talked about for cellulosic ethanol and break it down in sort of a Fischer-Tropsch process, and get it down to carbon monoxide and hydrogen, and then start putting the compounds back together to get hydrocarbons again.

And that one is one that—you had made the comment earlier—that we should not foreclose routes of research. And that is one that I think ought to be at least considered if, and I don't know whether you have any money in that kind of an approach.

Mr. KARSNER. Yes, sir. I think that approach is being pursued widely amongst many of the people that we work with and affiliate, particularly through the basic science program and the——

Mr. OLVER. Through the basic science, not through the development side yet. It is out in the basic science side.

Mr. KARSNER. Well, I think that is right. We haven't seen a commercially scalable process integration proposal of the type that you are talking about. That dialogue has really just begun over the last 12 months to 24 months.

People like Jay Keasling and people like Dumesic over at University of Wisconsin think it is very promising, and it certainly would be the case that the department is not at all foreclosed on that. The Secretary is actually quite fond of that particular scheme and pathway.

To some extent, it is sort of first past the post. We don't want to choose any one of these things. We want to cultivate the conditions where the first one that succeeds is allowed to succeed. But if you have folks you would like to refer to us and have that conversation—applied science program—our door is really quite open. We do not have——

Mr. OLVER. In the applied science, in the applied science.

Mr. KARSNER. That is correct.

Mr. OLVER. That is a different section from what you have in your responsibility.

Mr. KARSNER. We handle the biofuels. It is applied science in use perspective. We work closely with the basic sciences which operate the three——

Mr. OLVER. So that argument could come under you because it starts with biofuel stocks——

Mr. KARSNER. Yes.

Mr. OLVER [continuing]. And goes down and then reconstitutes, which strikes—think that that would take more energy than just coming down the several steps along the way. But if there are more efficient steps coming down all the way, and then building up, it might be that it might prove to be marginally the better way to go.

Mr. KARSNER. The question is not the process itself. It is what is the relative maturity of the process compared to all other processes. We are open to all these things, and work with them at the appropriate place in the RD&D pipeline where they exist. So if they are ready to build out today, which I do not think is the case with that particular process, that is closer to our shop.

If they are just at the beginning of studying on how to string together alcanes to hydrocarbons from cellulosic or green sources, that is more resident in Dr. Orbach's shop. But we will find a home for it if it is a viable process. And we are certainly not foreclosing on that. Of course, every cellulosic developer that comes to us says his thing is better than the next guy.

You know, our deal is in the national interest to cultivate the right policy conditions, market conditions, and have multiple bets in parallel to see which one is first past the post.

Mr. OLVER. I think we are at time up, but if I can have 1 more minute?

Mr. VISCLOSKY. One.

HYDROGEN ECONOMY

Mr. OLVER. I want to just go back to the hydrogen economy again for a moment, because there has been much said about it, and my guess is that you all understand that in the process of developing a hydrogen economy, why I suggested that a battery breakthrough would be very important.

But in a hydrogen economy, whether you make hydrogen by starting with coal or natural gas and blasting it with heat and pressure and water and so forth, you get hydrogen, but you use a hell of a lot of energy. And the amount of energy that you use is greater than what you are going to get out by then using the hydrogen in any mechanism we know.

Well, the same thing is basically true if you are going to do it with nuclear power, at least—nuclear power, however the nuclear power happens to come.

You are going to use a lot of energy to break down that, even if it is basically just an electrolysis to hydrogen, in which case the transmission and the storage and so forth becomes really key. So you are never in these processes going to get more energy out when you finally work with the hydrogen fuel cell at the end and put hydrogen in it in order to run a vehicle.

It may be important to do it and valuable to do it, simply because you are changing the direction that it is—you are changing the—you are getting away from the $CO_2$ issue if you can make the hydrogen by some mechanism other than using coal and other hydrocarbon kinds of mechanisms. But you are not going to get away

from the fact that you will be using more energy than you will get out of the process in the long run. I believe that is correct.

Mr. KARSNER. In the law of thermodynamics, each conversion loses energy, so it is correct in that sense. And just viewing hydrogen much more so as a carrier of energy rather than the source of energy is sort of important to our concept ultimately.

So you are right. It is competition with plug-ins and batteries. We pursue them both. It is a race between the efficacy of protons versus electrons in carrying our energy to displace oil. But thought about in the appropriate context, each of those can find an appropriate mix in the marketplace.

Mr. OLVER. Okay.

Mr. VISCLOSKY. I never learned that law in law school at Notre Dame. [Laughter.]

Mr. KARSNER. They taught it at Michigan. [Laughter.]

Mr. VISCLOSKY. I am sure they taught it—and Ohio, let's just say, and South Carolina. I will go down the road with you, okay?

Following up on the hydrogen, though, we have some very specific questions we would ask for the record as far as how the monies that are being transferred, and you had an earlier interchange with Mr. Olver, are being redistributed. And if you could answer that for the record.

Mr. KARSNER. Yes, sir.

ENERGY EFFICIENCY PROGRAM INVESTMENT

Mr. VISCLOSKY. Also, I do make note of the fact that the snacks have now gone and the members have gone, so there must be some correlation.

I would, again, want to thank Mr. Hobson, because when he became Chairman 5 years ago they arrived on the scene, and it has helped attendance.

I also would be remiss, and I do believe if he was here he would join me, Mr. Secretary, Mr. Hobson and I have been very perturbed at most of our hearings this year about the lack of follow-through or the complete ignoring of not congressional direction but the law that was signed by the President that was passed by the Congress.

In this case, I want to thank you because there was a direction in the law passed by Congress, signed by the President, that we were having a very difficult time with, and you were very responsive and very cooperative and have done everything possible to make sure the law is implemented. And I certainly appreciate that very much.

And I just want you to know fair is fair, and in this case, you went out of your way, and I appreciate that very much.

I would just ask in the end, and everybody is getting real nervous here now, to get us off—just one last question. And I am not trying to be facetious, Mr. Karsner, but to almost get back to my original point, we are spending a lot of money.

And there are a complex number of reasons why gasoline is whatever it is today. If I am that average constituent waiting on tables at a diner, working in a mill or, as Ms. Emerson said, driving 45 minutes each way in the country, it is killing them.

What can we tell the American people we are going to get out of this investment the next year as far as some immediate—we all

are paid to look down the road. What about the next 12 months? What are you working on that we can say something is going to start turning a corner?

Mr. KARSNER. I wish I could tell you that there was an easy fix. I have to answer that for my own family when I visit with them. And there isn't an easy fix. We have been postured toward long-term transformational technologies.

We have moved more than ever, I think it is fair to say, under this secretary toward commercialization and deployment in an intelligent way that views the scale of the problem and the rate of deployment relevant to the problems as a guiding metric. That has not always been the case.

The bottom line for all the technologies that are in these portfolios is to compete today. We can no longer compete them exclusively on first cost, the cost you see when you first buy a widget, the cost you see when you first buy a fuel.

It has got to be on the life cycle, total cost of ownership. And until we impress that as the competitive metric in our society, and stop doing things at builder's grade, or stop viewing our investments in clean energy technologies or new transmission, as only the investment on the day we make them, then we won't get to deployment.

But the loan guarantees are meant to do that. $38 billion are meant to push this stuff out the door. Banks, investors, are capitalizing in this way. And of course, we want to continue to work with your leadership, Mr. Chairman, to come up with the mechanisms that adapt our institution toward more rapid commercialization.

Mr. VISCLOSKY. Gentlemen, do continue your hard work.

And, Mr. Secretary, if you could also stay in close touch with us as far as the permutations and progress on FutureGen.

Mr. KARSNER. Yes, sir.

Mr. VISCLOSKY. And again, thank you very much for your cooperation, and thank you for your time and patience.

[Questions and Answers for the record follow:]

QUESTIONS FROM CHAIRMAN VISCLOSKY

WEATHERIZATION: BALANCE BETWEEN BASIC AND APPLIED ENERGY RESEARCH

Chairman Visclosky. Mr. Albright, when we questioned the Secretary several weeks ago about the elimination of the weatherization program, he claimed that weatherization only had a return on the investment ratio of 1.5-to-1, while for energy research it was 20-to-one. I have several questions related to that comparison your Secretary offered:

Does the estimate of $1.50 returned for every $1 invested in weatherization count only the first year of energy savings, or does it assume the life of those energy-saving improvements (typically 20 years)?

Mr. Albright. The energy-saving improvements were estimated to have 20 years of useful life. The energy savings benefit/cost ratio for the Weatherization Assistance Program of 1.53 to 1 is from an assessment by Oak Ridge National Laboratory (ORNL). The calculation is based on five factors: average annual Mbtu energy savings per home, projected energy prices, average weatherization retrofit cost per home, a discount rate, and an estimate of the useful life of the weatherization measures.[1]

Chairman Visclosky. For FY2009, the Department is requesting roughly $3 billion for applied energy research in the Energy Efficiency and Renewable Energy, Electricity Delivery and Energy Reliability, Nuclear Energy and Fossil Energy accounts. For basic research in the Office of Science, the Department is requesting $4.7 billion, or 57 percent more for basic research than for applied energy research. Given the energy and climate change crisis that we are facing, please explain why that balance makes sense.

Mr. Albright. This balance makes sense when we consider that for applied energy and environment research, development and deployment (RD&D), there are many other federal and non-federal sources of support and promotion beyond DOE's $3 billion applied research budget. By contrast, the federal government is the primary supporter of basic research and basic science for energy applications, or "use-inspired" basic research. The Office of Science supports basic and "use-inspired" research not only in energy and climate change science and technology, but in other areas that are important to the nation's continued innovation and competitiveness.

[1] The ORNL analysis can be found on the web (http://weatherization.ornl.gov/pdf/CON-493FINAL10-10-05.pdf). The benefit/cost ratio in the study is 1.34 – the 1.53 ratio cited above uses the same calculations with data updated for 2006.

DOE and the federal government overall have many mechanisms to address energy challenges beyond DOE's $3 billion for applied energy RD&D. Federal non-R&D support mechanisms for applied energy technologies research, development and deployment include:

- Energy Technology Tax Credits
- Loan Guarantees
- Low-interest subordinated loans (COMPETES)
- Renewable Fuel Standard (EISA)
- Prizes and contests (e.g. Solar Decathlon)
- Research and Experimentation Tax Credit

Many of these mechanisms are not limited to RD&D, and are recent additions to DOE's toolkit, authorized by the Energy Policy Act of 2005 (EPAct 2005), the America Competes Act of 2007 (COMPETES), and the Energy Independence and Security Act of 2007 (EISA). For example, the Congressional Budget Office (CBO) estimates that use of energy tax incentives contained in the Energy Policy Act of 2005 will amount to more than $1.6 billion in 2009.[2] The Internal Revenue Service estimated that in 2005, taxpayers received nearly $6 billion in research tax credits.[3] This is part of a general trend in recent decades, for industry to fund and perform a growing share of applied RD&D efforts in the United States.[4] Additionally, EPAct 2005 and the FY 2007 Energy and Water Development Appropriation Act authorized the Department to issue loan guarantees to support advanced energy projects. In 2008, Congress, in guidance accompanying the FY 2008 Energy and Water Development Appropriations Act, specified that an additional $38.5 billion in loan guarantee authority was available to DOE for projects that employ advanced technologies that avoid, reduce or sequester emissions of air pollutants and greenhouse gases.

DOE's Office of Science invests in the basic research needed to create and transform energy technologies, since we know that current technologies and policies are not going to be able to meet the long-term future energy needs of a rapidly growing and developing world population. The Department is guided by the Administration's R&D Investment Criteria in determining which applied R&D activities to engage in. We want to avoid activities that industry is capable of doing and do not want to discourage or even displace industry investment that would occur otherwise. The Department's applied research programs try to avoid duplicating research in areas that are receiving funding from the private sector, especially for evolutionary advances or incremental improvements. If Federal funding for energy basic research is reduced, there will be negative consequences for applied energy research across the board.

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[2] http://www.cbo.gov/ftpdocs/65xx/doc6581/hr6prelim.pdf
[3] http://www.irs.gov/pub/irs-soi/03co01rsrchcr.xls
[4] http://www.nist.gov/director/planning/tassey_re_tax_credit_jtt2007.pdf

Over the past several years, the Office of Science and the applied energy and environment technology programs (collectively the Offices of Energy Efficiency and Renewable Energy, Nuclear Energy, Fossil Energy, Electricity Delivery and Energy Reliability, Environmental Management and Civilian Radioactive Waste Management) have coordinated in areas such as biofuels derived from biomass, solar energy, hydrogen, solid-state lighting and other building technologies, the advanced nuclear energy systems, vehicle technologies, and improving efficiencies in industrial processes. The Office of Science supports these programs by hosting applied research in the Office of Science laboratories. For example, the Oak Ridge National Laboratory is the host for the National Transportation Research Center which performs research dealing with almost every aspect of the transportation industry. The FY 2009 budget request highlights an additional six areas of R&D coordination in crosscutting areas of impact: (1) advanced mathematics for optimization of complex systems; (2) electrical energy storage; (3) carbon dioxide capture and storage; (4) characterization of radioactive waste; (5) predicting high level waste system performance over extreme time horizons; and (6) high energy density laboratory plasmas.

The Office of Science not only supports areas of transformational basic research to address the pressing challenges of energy security and climate change, and to assist the energy and environment technology programs' applied RD&D efforts, SC also directly and indirectly through its user facilities, enables and supports fundamental and applied research in all DOE's mission fields. For example, the single largest group of researchers that use DOE's synchrotron light sources is biologists. These biologists are not only probing the structure and functions of biological molecules for applications in energy and environmental solutions but are also looking at molecules and systems related to health, such as pharmaceutical development and understanding disease. Likewise, the users of DOE's neutron scattering sources are probing new materials for future energy technologies as well as for other technologies that will have broader applications in industries unrelated to energy use.

The $4.7 billion FY 2009 budget request for the Office of Science also recognizes DOE's mission-critical support in areas that advance the frontiers of knowledge in the physical sciences and areas of biological, environmental, and computational sciences; and provides world-class research facilities for the Nation's science enterprise, both basic and applied. The Department's support of world-leading research programs at universities and national laboratories helps ensure that we will cultivate and retain a skilled workforce here in the U.S., thereby promoting an economy driven by scientific excellence and innovation.

Together, the Office of Science and the Department's applied energy and environment technology programs support a balanced portfolio to position the U.S. to be a leader in solving our energy and climate challenges. If we do not make these balanced investments in research now, developing these technologies will be significantly delayed.

Chairman Visclosky. What kinds of research accounted for the 20-to-1 ratio: is that basic science research, applied energy research, or all research?

Mr. Albright. The research yielding the 20-to-1 ratio is primarily energy efficiency and renewable energy applied research.

Chairman Visclosky. Does that 20-to-1 ratio compare to the total investment in research against the total output, so that dead ends that never make it to the market are included, or did it account only for successful research projects?

Mr. Albright. Based on a study by the National Research Council, investments in energy efficiency and renewable energy applied R&D result in energy impacts 20 times greater than costs.[5] The Council selected and prepared a series of case studies on technologies and programs, including both successful and failed or terminated projects.

[5] "Energy Research at DOE: Was It Worth It?" National Research Council (http://www.nap.edu/openbook.php?isbn=0309074487). The figure of 20 to 1 return on investment comes from dividing the approximately $30 billion in benefits by the approximately $1.56 billion investment, which is increased if the environmental benefits are included.

CONTAMINATION FROM SOLAR PANEL MANUFACTURING

Chairman Visclosky. Mr. Albright, the boom in efficient technologies and renewable sources of energy is hopefully just the beginning. I think we all recognize the environmental necessity, and the potential economic benefits, or this trend.

Unfortunately, some of these technologies produce their own waste streams that can themselves be damaging if they're not prepared for and managed appropriately. For instance, waste from manufacturing solar cells is a growing problem in China, where they're producing panels to meet our growing demand.

Mr. Albright, are there other technologies that are producing wastes that are potentially harmful to our environment?

Mr. Albright. The fabrication processes for many technologies across the entire industrial sector, including energy technologies, produce byproducts that are potentially harmful to the environment. The real issue at hand is how companies will handle environmental hazards in a responsible manner, consistent with applicable state and federal regulations.

Chairman Visclosky. What is the Department doing to develop the technologies to reduce, manage, and cleanup these wastes?

Mr. Albright. The Department examines each of the energy technologies it develops for environmental impact and has funded research and development on photovoltaic recycling technologies. Much of this work is done at Brookhaven National Laboratory (BNL). In addition, U.S. energy technology manufacturers, including members of the solar technology industry, take environmental issues very seriously and have an excellent track record of abiding by environmental regulations. The industry collaborates with BNL in further advancing recycling technologies.

The Department, together with the EPA, strongly encourages and promotes consumers to recycle energy saving compact fluorescent lamps (CFLs). This is done by coordinating CFL recycling programs offered by utilities with manufacturers and retailers and by providing information and resources on recycling activities to consumers via the ENERGY STAR® website and consumer materials.

Today, nearly all batteries for hybrid vehicles are produced abroad and any waste streams generated during manufacturing are managed in those countries. For the batteries that are manufactured in the U.S. and our envisioned future growth in domestic battery manufacturing, our strong environmental regulations should ensure that waste streams are properly managed.

Most hybrid vehicles manufactured to date are still on the road. Therefore, recycling of hybrid batteries has not been an issue. In the future, when these vehicles are retired in

large numbers and new battery chemistries come on-line, the recycling infrastructure currently in place for both lithium ion and nickel metal hydride batteries will need to gradually expand. Because of the high value materials contained in these batteries and the mature auto dismantling/salvage industry, hybrid vehicle batteries will be recycled. In addition, all of our battery development efforts include analysis and/or R&D addressing battery recycling and disposal issues specific to the battery type. Through our R&D, we work to eliminate hazardous materials content and develop recycling methods. For example, Johnson-Controls-Saft just completed a two year recycling study for their lithium ion hybrid battery. The study quantified the cost of recycling and assessed the environmental impact and energy requirements. Based on the results of the study, the company concluded that the recycler (Umicore) would willingly pay Johnson Controls-Saft for their used batteries because of the value of the cobalt and other materials that can be can profitably extracted after they are removed from retired vehicles. After the valuable materials are extracted, the waste products can be disposed of in accordance with EPA regulations.

OFFICE OF FOSSIL ENERGY

Chairman Visclosky. I can't help but notice that the Department does not seem to have a strong commitment to the Fossil Energy programs, as there is no Assistant Secretary, nor a Principle Deputy for Fossil Energy. We appreciate that Mr. Slutz can be here in an "acting" capacity, but the lack of personnel in the top spots is duly noted. Under Secretary Albright, where is the Department's commitment to this program? (FE)

Mr. Albright. The administration is committed to the Fossil Energy program, as demonstrated by the significant increase in the program's budget request for FY 2009. A candidate was nominated for the position in December 2007 by the President, but unfortunately withdrew from the nomination in February 2008. The administration is continuing to search for a qualified nominee.

CO2 EMISSIONS FROM THE PRODUCTION OF BIOFUELS

Chairman Visclosky. Mr. Karsner, can you comment on the emission of CO2 from the life-cycle production and use of corn ethanol in vehicles, versus the use of gasoline?

Mr. Karsner. When using corn-based ethanol in vehicles, the life-cycle emissions of CO2 are moderately lower than for gasoline. According to Argonne National Lab's analysis, the life cycle greenhouse gas emissions of corn-based ethanol can result in reductions of about 20% compared to the emissions from gasoline.[6] This is a comparison between pure ethanol and pure gasoline on a Btu equivalent basis. The level of reduction depends in part on the type of energy source used in the conversion facility. For example, if the conversion facility were to combust wood chips or distillers dry grains (DDGS) to provide heat and power, then the CO2 emissions would be far lower than if the facility relies on grid power from non-renewable sources such as coal.[7]

Chairman Visclosky. If I am using an ethanol blend in my vehicle, am I reducing overall CO2 emissions?

Mr. Karsner. Yes, E-10 with corn-based ethanol produces less CO2 emissions than regular gasoline. Currently, most U.S. ethanol used comes from starch (corn). Significant emissions reductions are expected to be obtained when cellulosic ethanol is used because the cellulosic feedstocks are derived from waste materials, agricultural residues, forestry residues or dedicated cellulosic energy crops, which allow use of their own built-in source of heat and power instead of relying on external, fossil-derived sources.[8]

Chairman Visclosky. If there are more vehicles using bio-fuels, do net CO2 emissions drop?

Mr. Karsner. Net CO2 emissions would drop when more vehicles use biofuels.[9] This is particularly true if cellulosic ethanol is used and if the vehicle is optimized to run on E85 instead of gasoline.[10] One external analysis indicates that mid-level blends of ethanol will also lead to lower CO2 emissions than E10.[11]

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[6] Argonne National Laboratory data on greenhouse gas impacts of biofuels can be found at http://www.transportation.anl.gov/pdfs/TA/468.pdf.

[7] Source: Wang et al. "Life-cycle energy and greenhouse gas emission impacts of different corn ethanol plant types." Center for Transportation Research, Argonne National Laboratory. Environmental Research Letters, Vol. 2, 024001, May 22, 2007.

[8] Ibid.

[9] Argonne National Laboratory data on greenhouse gas impacts of biofuels can be found at http://www.transportation.anl.gov/pdfs/TA/468.pdf.

[10] Source: Wang et al. "Life-cycle energy and greenhouse gas emission impacts of different corn ethanol plant types." Center for Transportation Research, Argonne National Laboratory. Environmental Research Letters, Vol. 2, 024001, May 22, 2007.

[11] David P. Gardiner's *Improving the Fuel Economy of Light-Duty Ethanol Vehicles, an Engine Dynamometer Study of Dedicated Ethanol Engine Strategies*, SAE Paper 1999-01-3568, 1999, finds a potential fuel economy improvement with E85 of up to 10% relative to gasoline through appropriate engine optimization.

CO2 EMISSIONS FROM THE PRODUCTION OF BIOFUELS

Chairman Visclosky. Some recent analyses have concluded that many of the alternative biofuels do not result in a net reduction in greenhouse gas emissions. This is not only true for corn-based ethanol, but apparently for a number of other feedstocks as well, because traditional analyses did not factor in the land-use changes that result when croplands are converted to growing ethanol feedstock.

What analyses does your office use to be certain that our investment in better technologies for producing ethanol will actually result in a net improvement in terms of greenhouse gas emissions?

Mr. Karsner. The recent studies that you are referring to have issues that have been pointed out by our scientists at Argonne National Laboratory and Oak Ridge National Laboratory and several independent experts.[12] At the same time, the studies do highlight the need to take into account land use change implications of expanding biofuels production. We are taking this issue seriously and believe that the best approach is to develop sound analytical tools that can address these questions with reasonable assumptions and methodologies. At this time, no models accurately account for potential land use changes. We are working with our colleagues at EPA to develop these analytical tools which will eventually be able to craft sustainable biofuels production guidelines.

[12] The response from Argonne National Laboratory and Oak Ridge National Laboratory can be found on EERE's website at http://www1.eere.energy.gov/biomass/pdfs/obp_science_response_web.pdf.

CO2 EMISSIONS FROM HYBRID VEHICLES

Chairman Visclosky. Mr. Karsner, when comparing CO2 emissions generated from a gasoline engine, compared to plug-in hybrid vehicles that are getting their power from electricity generators that are emitting CO2 emissions – is there a net reduction of CO2 using plug-in hybrid electric vehicles – or do plug-in electric hybrid vehicles exacerbate CO2, because utilities need to work more?

Mr. Karsner. Our analysis indicates that there would be a net reduction in CO2 emissions resulting from use of plug-in hybrid vehicles. The primary reason is the higher efficiency along the electricity generation and distribution path compared to the energy conversion chain from crude oil to gasoline to the combustion process in the vehicle. Naturally, there are variations given the different methods of producing electricity, but on average, there will be a net reduction in CO2 emissions. As we integrate more renewable electricity into our generating capacity, plug-in hybrid CO2 emissions will be further reduced. For example, when charging with the U.S. average "grid-mix" electricity (50% electricity from coal), today's plug-in hybrid electric vehicle would reduce CO2 emissions by 27% versus a conventional internal combustion engine vehicle (same vehicle size and base weight). In California, where coal accounts for only 33% of the electricity production, the CO2 reduction for a plug-in hybrid would be 39%, when compared to a comparable internal combustion engine vehicle. Reductions in CO2 emissions are expected to improve as plug-in hybrid vehicle technology matures.

ADVANCED TECHNOLOGY IS NEEDED TO CURB CO2

Chairman Visclosky. An MIT study concluded that future hybrid vehicles could attain almost three times the miles per gallon of today's conventional vehicles, given major advances in power electronics and batteries.

Mr. Karsner, in your opinion, what specifically are the "major advances" necessary – what sort of research is required?

Mr. Karsner. Hybrid vehicles using today's technologies offer 30 to 40% improvement in fuel economy over conventional vehicles. Technological advancements would likely lead to further improvements. The major advances necessary to achieve this higher fuel economy are primarily in the development of improved batteries. The Vehicle Technologies Program battery research portfolio addresses the key technical hurdles including battery life, abuse tolerance, safety, and cost. Research is also underway to discover the next advanced battery chemistry that can enable even more efficient electric drive vehicles. Naturally, research into lightweight materials, power electronics and motors, and advanced combustion will contribute to higher efficiency plug-in hybrids as well.

HYBRID VEHICLES: IS SAFETY A TRADE-OFF?

Chairman Visclosky. Are hybrid vehicles utilizing lightweight/body chassis materials to reduce the vehicle power and energy requirements – to increase battery efficiency? If so, is passenger safety – say, from impacts – being compromised? What type of testing do you do on materials?

Mr. Karsner. Vehicle manufacturers are developing and using new materials and manufacturing processes to help reduce the weight of vehicles of all types in order to improve fuel economy. Passenger safety is not being compromised because all vehicles must comply with the safety standards established by the Department of Transportation. The Vehicle Technologies Program tests the lightweight materials it develops for their energy absorbance and structural integrity to assess their suitability for automotive use. This national laboratory testing is performed in cooperation with auto manufacturers. The goal of our lightweight materials work is to decrease the weight of the vehicle while maintaining the performance, safety and recyclability.

PLUG-IN HYBRID ELECTRIC VEHICLES

Chairman Visclosky. Mr. Karsner, plug-in hybrid electric (PHEV) vehicles have the potential to achieve large reductions in energy consumption and pollutants while increasing national security. Further, if integrated into a "smart grid" they can help to level utilities' electricity demand profiles by charging at night and during periods of lower electricity demand. A significant barrier to accelerating development of PHEVs is the lack of consensus-based, national battery performance and safety standards, with lithium-ion batteries appearing to hold the greatest promise. Battery safety is fundamentally a "system" issue involving not just the battery, but its packaging, charging stations, power electronics, and connecting infrastructure.

Looking at funding within the Office of FreedomCAR and Vehicle Technologies program, are there plans to engage U.S.-based standards development organizations (SDOs) to develop critical competitiveness in this growth market and the more rapid commercialization of PHEV vehicle technology? What are such plans in the funding requested?

Mr. Karsner. The Vehicle Technologies Program is engaged with standard setting organizations such as the Society of Automotive Engineers on plug-in hybrid test procedures and the Institute of Electrical and Electronics Engineers for plug and charger issues associated with the vehicles. In addition, efforts within the Energy Storage R&D activity include work with the national and international standards development organizations to harmonize standards for battery testing, rating, and shipping. These activities will continue and will grow as this technology approaches commercialization. All the activities related to standards setting are included within the current request.

SOLAR ENERGY: CONCENTRATING SOLAR POWER

Chairman Visclosky. The concentrating solar research target for the intermediate power market is 2015, and baseload power market by 2020. The introduction of concentrated solar power in the intermediate market would augment the U.S. power market that now receives nearly 70 percent of its energy from coal and natural gas.

If concentrating solar power is so promising, why is the FY 2009 budget request $19 million, a reduction of $10 million form the FY 2008 enacted levels?

Mr. Karsner. Concentrating solar power is currently cost competitive in some markets with the federal investment tax credit and with State renewable energy certificates. A 64 MW plant opened last year near Las Vegas and is providing electricity to the local utility under a long term purchase power agreement. The $10 million decrease in concentrating solar power research and development reflects a down-selection of industry projects in trough manufacturing and thermal storage technologies, allowing only the most promising contracts representing the best value to the taxpayer to move into the second phase of funding in FY 2009.

Chairman Visclosky. What is the limiting factor on this program for introduction in the intermediate power market sooner than 2015? Is it technology or financing?

Mr. Karsner. The current 2015 path for DOE's Concentrating Solar Power (CSP) R&D is adequate and appropriate and is supported by sufficient funding in the FY 2009 Budget as part of a balanced portfolio of energy R&D. Efforts to address technological limitations planned for 2009 include research to help lower the cost of solar collectors and thermal storage methods, thereby helping to make the technology more competitive. Storage technology is a priority because improvements are needed for concentrating solar power to be feasible for baseload power.

SOLAR HEATING AND COOLING SYSTEMS

Chairman Visclosky. This Committee has been very supportive of solar heating and cooling systems – and your budget request document notes that the market for solar water heaters is booming in countries such as China, Israel, Germany and Austria. However, in the United States solar water heaters contribute less than 0.1 percent of the water heating market even with a solar tax credit. Water heaters are the second largest consumer of energy in a home behind space heating.

Why isn't there more use of solar water heaters in the United States? Are the products not available? Or are they expensive? Is it limitations on their use, for example, they are not practical in non-sunny locations?

Mr. Karsner. Based on consistent feedback from industry, stakeholders, builders and end users, the low penetration is primarily due to the high up-front installed cost and such barriers as poor consumer awareness, low perceived quality assurance, and poor aesthetics for some industry products. The Department plans to continue promoting these technologies in 2009, which is expected to help industry address these issues. These systems have proven to be successful in the warmer climates where there is little danger of freeze damage. Joint research being conducted with the Building Technologies Program's Building America and Envelope Research Program activities, along with the Solar Program, is developing ways to combine solar heating and cooling systems with photovoltaic systems and integrate them into the roof. This work is expected to improve the appearance of the systems, increase efficiency and reduce the combined system costs.

Chairman Visclosky. Your budget "moves" this activity, funded at $2 million in FY 2008, from the solar energy account to the "Building Technologies" account. Are you in effect, getting rid of it? Will there continue to be R&D on this technology, such as making its use cheaper for the consumer? What will be the focus for solar water heating in the Building Technologies account, and at what level of funding?

Mr. Karsner. The Solar Heating and Cooling (SH&C) activity continues to be funded within the Department's Office of Energy Efficiency and Renewable Energy (EERE) budget. DOE has proposed to move the SH&C to the Buildings Technologies Program beginning in FY 2009 and has requested $3.7 million for the effort. This transfer is expected to improve alignment and support the EERE goal of Zero Energy Homes (ZEH) by 2020. This realignment should provide a more direct and efficient coordination of RD&D activities by combining SH&C energy supply and energy efficiency load reduction technology options for building applications as part of the whole buildings design approach utilized by the Building America Program's pathways to ZEH. The pathway to ZEH is attainable through greatly improved energy efficiency measures to reduce the energy load which will then be met by renewable energy supply technologies, like SH&C and photovoltaics.

Activities for Solar Heating and Cooling in FY 2009 will include research and development of a conceptual design for an integrated solar electric/thermal system sized for an average single-family home and the development of the prototype systems; providing technical support to states and cities interested in establishing a policy that encourages the use of solar water heaters as a method of saving energy and reducing greenhouse gas emissions; and support of a solar rating and certification system.

HYDROGEN R&D

Chairman Visclosky. The FY 2009 budget request for Hydrogen Technology is $146.2 million, a reduction of $64.8 million below FY 2008 enacted levels. Some of this reduction ($49.3 million) in the hydrogen account is attributed to moving "technology validation, safety codes and standards, and education" activities to another account: vehicle technologies.

The FY 2008 enacted level for hydrogen technology and validation was $29.7 million; the FY 2008 enacted level for safety codes and standards was $15.8 million and the FY 2008 enacted level for hydrogen education was $3.8 million. What is the funding level proposed for FY 2009 for these activities in the vehicle technologies account? Will these activities change focus in the vehicle technology account, and if yes, how?

Mr. Karsner. The FY 2009 funding request for those activities is: $14.789 million for hydrogen technology and validation, $12.238 million for safety codes and standards, and $4.0 million for education. FY 2009 will be a transitional year for these activities, with ongoing hydrogen projects supported as the activities are integrated into the full breadth of vehicle technologies research, development and validation.

Chairman Visclosky. Within the Hydrogen Technology R&D account the FY 2009 budget eliminates all funding for the hydrogen production and delivery research and development, a reduction of $39.6 million below FY 2008 enacted levels. Why have you eliminated this activity?

Mr. Karsner. EERE is not requesting funding for production and delivery R&D so that the Hydrogen Program can focus exclusively on the critical path research and development needed to reduce the cost and improve the durability of fuel cells, and to increase the capacity of low-pressure hydrogen storage systems for on-board use. This will enable the Program to stay on track for achieving technology readiness in 2015.

Research and development related to the production of hydrogen from sources other than renewable energy is funded elsewhere in the Department. In the Office of Science research is focused on direct water splitting using solar energy, and microbial hydrogen production processes. There is also work on coal-to-hydrogen and nuclear-to-hydrogen pathways in Fossil Energy and Nuclear Energy, respectively. From a commercial standpoint, natural gas, including bio-gas, provides a cost-competitive method for making hydrogen today.

HYDROPOWER RESEARCH AND DEVELOPMENT

Chairman Visclosky. The Administration has not requested any funding for the hydropower program for several years, and last year Congress provided $9.9 million for innovative technologies for harnessing hydrokinetic energy resources, such as ocean wave and ocean and tidal current energy, as well as conventional hydropower.

How does the Department propose to re-establish the hydropower research and development program?

Mr. Karsner. The Department is not re-establishing a research and development program exclusively devoted to hydropower. In FY 2008, DOE established a new Water Power program to conduct research and development activities for advanced water power technologies, in accordance with the FY 2008 omnibus appropriations bill. In FY 2009, the Department has requested $3 million for innovative hydrokinetic technologies.

Chairman Visclosky. Will research and development for conventional hydropower be continued?

Mr. Karsner. Although hydropower may not entirely be excluded, the FY 2009 Water Power request focuses on innovative and advanced hydrokinetic technologies.

Chairman Visclosky. What are some of the R&D initiatives the Department is investigating for both conventional hydropower and the new ocean, tidal and instream technologies? Will there be further advanced turbine testing or new waterpower technology demonstrations and environmental performance studies?

Mr. Karsner. As part of the Department's direction to further production from renewable energy sources, the FY 2009 Water Power Program will initially concentrate on (1) resource assessments in order to identify the prime domestic resource areas and based on these results, (2) technology characterizations of the various water power energy conversion technologies, with the goal of determining cost, performance and reliability characteristics, and (3) industry partnerships to take advantage of early industry demonstration projects to assess the "actual" performance and cost of real projects in the ocean.

ADVANCED COMBUSTION ENGINE RESEARCH AND DEVELOPMENT
QUESTION FROM CHAIRMAN VISCLOSKY

Chairman Visclosky. Mr. Karsner, by your own account, in the FY 2009 request for "advanced combustion engine R&D", it says that "the most promising method to reduce petroleum consumption through efficiency improvements in the mid-term (10-20 years) – or until fuel cell hybrid vehicles dominate the market – is to develop high-efficiency combustion engines and enable their introduction in conventional and hybrid electric vehicles."

Why is the budget request for FY 2009 for advanced combustion engine R&D $33.6 million, a reduction of $11.0 million below FY 2008 enacted levels, if the technology is so promising?

Mr. Karsner. Although the FY 2009 request of $33.6 million is about 25 percent lower than the FY 2008 appropriation of $44.6 million for Advanced Combustion Engine R&D, the FY 2009 funding request is consistent with the Administration's priorities and is only 3 percent lower than the FY 2008 request of $34.6 million. Congress provided an additional $10 million for this subprogram in FY 2008 resulting in the $44.6 million enacted level. The FY 2009 request in the area of Advanced Combustion Engine R&D is adequate to meet the goals of the program.

Chairman Visclosky. The solid state energy conversion, develops technologies to convert waste heat from engines and other sources to electrical energy to improve overall thermal efficiency and reduce emissions. Why the reduction in funding (-$700 thousand)? Isn't this an activity that warrants an increase? (FY 2008 enacted $4.5 million; FY 2009 request $3.8 million.)

Mr. Karsner. The FY 2008 request for Solid State Energy Conversion was $3.8 million. Additional funding was provided by Congress for this activity in FY 2008, resulting in the enacted increase to $4.5 million. The FY 2009 request is essentially the same as the FY 2008 request and is consistent with the Administrations priorities for this area.

INDUSTRIAL DISTRIBUTED ENERGY

Chairman Visclosky. In FY 2008, Congress re-established a distributed energy generation activity within the Industrial Technologies program. The Congress provided $14.4 million for this activity in FY 2008; and the Administration requested $1.5 million in FY 2009.

Mr. Karsner, what will the combined heat and power activity within the distributed energy program pursue in FY 2008?

Mr. Karsner. Industrial Technologies Program (ITP) distributed energy (DE) and combined heat and power (CHP) activities planned for FY 2008 will focus on advanced reciprocating engine development, performance improvement, and CHP market transformation.

Reciprocating engines are the predominant DE/CHP technology. Under the Advanced Reciprocating Engine Development, ITP will continue the cost-shared research, development, and demonstration activities with reciprocating engine original equipment manufacturers and national laboratories that is intended to result in distributed generation systems that are clean, energy efficient, and fuel flexible.

Applications of DE/CHP span industrial, commercial and even residential market sectors and all fifty states. Current CHP installed capacity is dominated by large industrial applications. There are opportunities for innovative applications in the small to medium industrial plants and other sectors of the economy. Through the Performance Improvement and Validation activity, ITP will support a limited set of data collection and performance analysis projects with industry cost-sharing in untapped industrial markets such as data centers and medium-size food processing plants, and energy-intensive plants with the opportunity to capture and use waste energy streams for clean energy production. ITP will work with industry to help develop the duel fuel capability of DE/CHP components such as turbines and seek to improve the system efficiency of thermal recovery technologies such as absorption cooling that we believe would lead to increased utilization of renewable fuels.

ITP will also provide independent analyses and insights in support of coordinated education and outreach by leveraging existing technology delivery, best practices, and assessment activities. ITP will continue to support the CHP Regional Application Centers (to be renamed "Clean Energy Application Centers" pursuant to EISA 2007) to effectively identify and assess the best CHP project opportunities and apply best practices for efficient project development and facility design/operations.

INDUSTRIAL DISTRIBUTED ENERGY

Chairman Visclosky. I think you believe that distributed energy, and combined heat and power technology is a worthwhile pursuit. Why only fund it at $1.5 million in FY 2009?

Mr. Karsner. DE and CHP are indeed important technologies. CHP can lower energy consumption and reduce fossil fuel-based generation. CHP is one of the most effective alternatives for accomplishing sizable near-term energy savings and corresponding greenhouse gas (GHG) reductions. Past efforts have resulted in notable technical accomplishments in distributed generation technologies such as gas turbines, engines, and microturbines. These past initiatives dramatically increased energy efficiency and improved emissions.

We are at a point in which CHP is on the path to becoming relatively well-established in traditional applications. Many of the barriers to market adoption are related to regulatory and utility practices rather than technical limitations.

RENEWABLE ENERGY PRODUCTION INCENTIVE (REPI)

Chairman Visclosky. Most of the tax incentives to increase the production of renewable energy are targeted at for profit utilities, and the smaller regional cooperatives don't get the same advantages. The REPI program was designed to level that playing field. However, the Administration proposes to zero out funding for REPI in FY2009. Please explain why you are making that recommendation.

Mr. Karsner. The Renewable Energy Production Incentive (REPI) does not serve the purpose for which it was intended, which is to be an incentive to public power companies to produce renewable energy. It does not provide that incentive. Instead, it has been a small, static amount, formulaically distributed to public power companies after the investment has already been made.

FEDERAL VEHICLE FLEETS

Chairman Visclosky. One of the best ways for DOE to lead the nation is by example. Your budget proposes a very modest amount of funding for the Federal fleet ($2 million) and slightly more funding ($6 million) for DOE sites, including a shift to alternative vehicle technologies. It would seem that DOE could lead the Nation, as well as increase market demand, by converting all of its vehicles to alternative fuels.

How many vehicles in total does DOE have, including its site contractors?

Mr. Karsner. As of September 30, 2007, the number of vehicles utilized by the Department of Energy was 14,544. This number reflects the amount reported by all DOE sites including contractors using the online reporting system, the Federal Automotive Statistical Tool (FAST). Under Secretary Bodman's TEAM initiative, DOE is planning to transition all of these vehicles to alternative fuels as soon as practically possible.

Chairman Visclosky. How many of these are currently fueled with alternative fuels?

Mr. Karsner. Shown below is a summary of the number of vehicles by fuel type.

Compressed Natural Gas - 435
Liquefied Natural Gas - 26
Liquefied Petroleum Gas - 17
E85 - 4,288
Gasoline - 6,876
Diesel – 2,902

Chairman Visclosky. Please provide, by DOE site, how much it would cost to convert these DOE vehicle fleets to alternative fuels, including the provision of alternative fueling stations if necessary.

Mr. Karsner. We are developing a comprehensive multi-year plan to convert all gasoline vehicles to alternative fuel, and provide refueling for all alternative fuel vehicles. The difference in cost between a gasoline vehicle and a flexible fuel model (i.e., a model capable of operating on E-85) is relatively low. Preliminary estimates to provide E85 refueling range from $400,000 to approximately less than $50,000 per site based on data from DOE sites, depending on the extent that the private sector is willing to provide refueling stations.

CONGRESSIONAL DIRECTION

Chairman Visclosky. Mr. Karsner, when the Secretary testified before this Subcommittee last week, we confronted him on the Department's failure to follow Congressional direction. You are about to share in that experience. Between the House report and the conference report accompanying the FY2008 omnibus, we provided over a dozen directives to your office. I won't embarrass you by asking you to identify each of those directives, but I do have a set of related questions:

Do you view report language as binding on your office, or merely advisory and something you can ignore at your discretion?

Mr. Karsner. The Department's position is that report language is not binding, but we do rely on it for guidance, and are often amenable to taking direction from the reports. I can assure you that my office takes report language very seriously.

Chairman Visclosky. Do you believe you are complying 100 percent with the directives Congress has given to your office?

Mr. Karsner. That is our intention.

Chairman Visclosky. Please provide for the record a report identifying all of the directives to your office contained in the separate House and Senate reports for FY2008, as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act for FY2008, and documenting the status of your compliance with those directives. I would like the same reports back from Mr. Kolevar's office and from Fossil Energy.

Mr. Karsner. Below I have provided all of the directives contained in the House and Senate FY2008 reports as well as those contained in the explanatory statement accompanying the Consolidated Appropriations Act, 2008.

House Directives

1. "The Committee directs DOE to implement an aggressive program to take advantage of the Historically Black Colleges and Universities and Hispanic Serving Institutes across the country in order to deepen the recruiting pool of diverse scientific and technical staff available to support the growing renewable energy marketplace."

   Status: Minority academic institutions are eligible to apply under EERE's competitive solicitations. In certain topic areas where appropriate, such as Topic Area 3 of the $7.5 million water power solicitation announced in May 2008, special consideration will be given to applications from minority academic institutions.

2. "The Committee directs that $10,000,000 of the building energy code increase in the Building technologies program be directed to state compliance programs as authorized under Section 128 of EPACT 2005."

   Status: The Department could not comply with the House Committee report language because there was no building energy code increase provided for in the FY 2008 Consolidated Appropriations Act. All funding beyond the FY 2008 Presidential Budget Request for the Building Technologies Program has been allocated as directed by report language accompanying the FY 2008 Consolidated Appropriations Act, as follows: $10 million to Residential and Commercial R&D, $5 million to Solid State Lighting R&D, and $8.544 million to equipment standards.

3. "The Secretary of Energy is directed to make FY08 Weatherization funding available from October 1, 2007 to March 31st, 2009, for states that submit plans requesting funds allocations for all or part of this period."

   Status: As part of its annual issuance of grant guidance for FY 2008 program year, the Department included the provision as requested by Congress, making it an option for States.

4. "The Committee directs the Department to establish a director for Indian Energy Policy and Programs to provide much needed coordination of the Department's activities and services to assist Indian tribes in developing their energy resources."

   Status: The Department has appointed Steven Morello as the Deputy Assistant Secretary for Intergovernmental and External Affairs, who is focused on standing up the Office of Indian Energy Policy and Programs as authorized by the Indian Tribal Energy Development and Self-Determination Act of 2005.

Senate Directives

1. "The Secretary of Energy is directed to make fiscal year 2008 Weatherization funding available from October 1, 2007 to March 31st, 2009, for states that submit plans requesting allocations for all or part of this period."

   Status: As part of its annual issuance of grant guidance for the FY 2008 program year, the Department included the provision as requested by Congress, making it an option for States.

Consolidated Appropriations Act Directives

1. "The Department is directed to fund $45,000,000 for advanced combustion engine research and development, $40,000,000 for materials technology, $18,000,000 for fuels technology, and $17,000,000 for technology integration."

   Status: As requested, the Department has allocated $45,000,000 for research and development of advanced combustion engines, $40,000,000 for materials, $18,000,000 for fuels, and $17,000,000 for technology integration.

2. "The agency should within available funds competitively bid an award for the Advanced Vehicle Testing Activity within the FreedomCAR and Vehicle Technologies Program to independently test and evaluate all vehicles developed in the upcoming plug-in hybrid electrical vehicle demonstration."

   Status: The Department is carrying out this request. The current contract for the Advanced Vehicle Testing Activity was competitively awarded in 2005 and will be recompeted when the current contract expires in FY 2009. EERE has issued a competitive solicitation for PHEV demonstration and will make award selections in early summer 2008. Data collection from the vehicles in the demonstration program is an important element of this activity, and these vehicles will be tested by the Advanced Vehicle Testing Activity.

3. "The Office of EERE is directed to reconstitute a distributed energy research and development program, and direct $10,000,000 of the increase for the advanced reciprocating engines system program and $5,000,000 for the combined heat and power program."

   Status: With its FY 2008 funding, EERE expects to establish some research projects in advanced reciprocating engine systems. EERE will also fund research efforts for accelerating the development and deployment of innovative combined heat and power solutions, including assistance for the Regional Clean Energy Application Centers (formerly titled CHP Regional Application Centers).

4. "The agency should, within available funds, provide no less than $3,700,000 for steel in the industries (specific) program."

   Status: Funding at the requested level is being provided to support continuing steel research projects and for the solicitation of collaborative research projects focusing on transformational iron and steel technologies areas having the largest potential for energy and carbon footprint reduction.

5. "[The agency should, within available funds, provide no less than] $3,000,000 for the information technology industry, from chip scale to data centers."

   Status: EERE has provided this funding and is planning a variety of activities aimed at improving the energy efficiency of the U.S. information technology industry in FY 2008. In data centers, collaborative activities with industry are focusing on developing tools to characterize energy use and identify opportunities for improvement, developing measurement protocols to define energy performance, conducting training seminars, and for testing of innovative power conditioning and cooling technologies.

6. "Within available funds, the Office of EERE should establish a FACA-chartered Federal Advisory Council to advise the Office of EERE for Finance, Investment and Technology Deployment."

   Status: EERE is consulting with the Department's General Counsel regarding the establishment of this FACA.

7. "Any changes in [the Weatherization] program implementation should be proposed to Congress in the Department's budget submission and not implemented before Congressional approval is obtained."

   Status: At the present time, DOE/EERE anticipates no changes in the FY 2008 Weatherization Assistance Program for Low Income People that will require approval by Congress.

8. "[T]he agency should redirect the remaining $742,500 of prior year funds from the Tower Power Project to fund the University of Maryland Energy Research Center."

   Status: Consistent with this request, EERE deobligated the funding for the Tower Power Project. Funds are at DOE headquarters and will be redirected to fund the University of Maryland Energy Research Center.

Mr. Kolevar. We found only one directive in these documents. The Committee encouraged the Office of Electricity Delivery and Energy Reliability to identify the potential energy savings that may be achieved as a result of locating generating facilities closer to the users. As noted in EIA's Annual Energy Review 2006 on page 221, transmission and distribution losses, or electricity losses that occur between the point of generation and delivery to the customer, are estimated as 9 percent of gross generation. These losses will be reduced as generating facilities are located closer to the user. This potential benefit of distributed generation, along with many other potential benefits, are

discussed in the study conducted by the Office of Electricity Delivery and Energy Reliability pursuant to Section 1817 of the Energy Policy Act of 2005, "THE POTENTIAL BENEFITS OF DISTRIBUTED GENERATION AND RATE-RELATED ISSUES THAT MAY IMPEDE THEIR EXPANSION (February 2007)".

Mr. Slutz. In response to your request, the Office of Fossil Energy has the following directives to report on items other than the listing of congressionally directed projects.

The Senate Report on the Energy and Water Appropriations Bill, 2008 Senate Bill S.175 (S. Rept. 110-127), contains no congressional guidance relating to the Office of Fossil Energy.

The House Report on the Energy and Water Development Appropriations Bill, 2008 House Bill H.R. 264 (H. Rept. 110-185, Part 2) contains the following guidance relating to the Office of Fossil Energy:

- Liquefied Natural Gas (LNG) Report. The Committee requests that Department of Energy (DOE) incorporate several specific key issues, including cascading failure, comprehensive modeling, risk tolerability assessments, vulnerability of containment systems, mitigation techniques, the effect of sea water coming in as LNG flows out, and the impact of wind, weather and waves in its current LNG study. Under the Consolidated Appropriations Act, 2008, the study is due on December 1, 2008.

- Clean Coal Power Initiative (CCPI). The Committee requests that DOE recast the CCPI to provide more support for demonstration of carbon capture, transport technologies and carbon sequestration.

- FutureGen. The Committee requests that DOE optimize the project design of FutureGen to support a proper sequestration demonstration and to provide a total life-cycle cost and project baseline for the streamlined FutureGen demonstration project by 120 days of enactment of the legislation.

- Fuels and Power Systems. The Committee requests that DOE focus research and design (R&D) efforts on $CO_2$ capture technology for existing pulverized coal (PC) combustion plants and to undertake large scale carbon sequestration experimental projects in reservoirs that are instrumented, monitored, and analyzed to verify the practical reliability and implantation of sequestration.

The Department is taking meaningful and substantial steps to comply with the above requests, including the following:

LNG. As noted above, the Consolidated Appropriations Act, 2008, directed the Department to submit to the House and Senate Committees on Appropriations a report on

LNG, as outlined in the House Report, by December 1, 2008. In furtherance of this report, the Congress has appropriated $7.9 million to DOE's Office of Fossil Energy to conduct large scale LNG pool fire experiments on water and to conduct cascading (multi-tank) failure analysis of an LNG vessel resulting from cryogenic and thermal damage. The FY 2009 Budget does not propose that DOE conduct LNG safety research because this research is not aligned with DOE's mission. Large scale LNG pool fire experiments will generate data on fire parameters such as thermal flux, flame height, burn rate, and smoke generation and shielding as a function of pool size. This data will provide decision makers with relevant information needed to accurately determine the risks from thermal hazards due to large LNG fires. The LNG cascading failure analysis will investigate the possibility of cascading (multi-tank) failure of an LNG vessel due to cryogenic and thermal damage and the consequences of such a failure on an LNG vessels' structural integrity. Sandia National Laboratory, Albuquerque, New Mexico, will conduct the research at their large scale experimental test site. While the anticipated completion date for this research is December 2009, the Department intends to provide a report on the status of its efforts by December 1, 2008.

CCPI. The Department plans to comply with the Committee's request for the next CCPI solicitation to provide more focus for demonstration of carbon capture, transport and storage technologies.

FutureGen. While the Department remains committed to the goals of FutureGen, several factors have caused the Department to restructure the original FutureGen project. Factors contributing to this decision include projected rising construction costs of FutureGen as originally structured, changes in the electricity market, and a growing near-term commercial interest in carbon capture and storage technologies in response to the policies of several states such as Florida, Kansas, Minnesota and California, which have recently conditioned the issuance of a permit for power plant construction on either no carbon content, the use of carbon capture and storage (CCS) technology or the flexibility to add CCS.

As a consequence of these factors, DOE has determined that it is necessary to adopt a new strategic approach. This new approach emphasizes early commercial experience with near-zero atmospheric emissions coal plants [Integrated Gasification Combined Cycle Technology (IGCC) and other advanced technology coal power plants with CCS] through a series of demonstrations linked to commercial operations. This newly structured FutureGen would limit DOE's cost exposure against potential cost-growth of FutureGen.

Under this new FutureGen approach, DOE proposes to accelerate the deployment of IGCC and other advanced technology commercial power plants equipped with CCS technology. While there are remaining concerns about capital cost for IGCC without CCS, the remaining risks are at a level that the industry commonly accepts in making investment decisions on such projects. The major barrier to commercial scale deployment of near-zero atmospheric emissions coal-fueled power production, which is also the thrust of this new approach, is the need for further development and acceptance

of CCS technology. All of the actions taken are in line with the guidance provided in the House Report language.

Fuels and Power Systems. The Committee requests the Department to focus R&D efforts on $CO_2$ capture technology for existing PC combustion plants, to include efforts on high-strength materials for heat intensive operations, plant efficiency and oxy-fuel combustion PC retrofit technology. In FY 2008, the Department's High Performance Materials Program will continue its focus on developing high temperature alloys and components for use in higher efficiency advanced PC combustion plants as well as in advanced combined cycle systems. In addition the Department's activities in support of the Committee's request are being conducted via the Innovations for Existing Plants (IEP) program. In FY 2008, the $36,081,000 appropriated for IEP will be used to initiate the research refocused on $CO_2$ capture applicable to existing PC plant technology. In FY 2008 and FY 2009, the IEP program will be refocused to develop advanced technologies economically and effectively to reduce $CO_2$ emissions from existing coal fired power plant designs. This program will conduct research directed at developing technology for the capture, separation, and compression of $CO_2$ from existing coal fired utility boiler technologies. In addition, large scale field testing of promising technologies in the areas of capture, oxy-combustion, and compression may be initiated.

With respect to Fuels and Power Systems, the Committee also requests that the Department undertake large scale (i.e., one million tons per year injection) carbon sequestration experimental projects in reservoirs that are instrumented, monitored and analyzed to verify the practical reliability and implementation of sequestration. The Department is responding to this request. DOE has made awards for five large-scale tests to four of the Regional Carbon Sequestration Partnerships (RCSP) for Phase III Large Volume Sequestration Testing. DOE is developing a peer-reviewed plan to be completed this spring that will identify the scientific and engineering test parameters to guide design and selection of large-scale tests. Items to be addressed include: rate of injection, duration of injection, and number and phasing of tests. The remaining proposed Phase III projects will be evaluated in the context of this plan. The evaluation process requires: 1) finalizing the technical scope of the projects by means of an independent study by an international group of experts; (2) undertaking a scientific evaluation; and (3) performing a cost analysis of the proposed projects to ensure the project costs are adequate prior to award. The estimated time-frame for evaluating the remaining awards is the summer of FY 2008.

In addition to the above reports from the Senate and House Committees, the House Committee on Appropriations issued a report on December 17, 2007 containing one additional request regarding the Consolidate Appropriations Act, 2008, not included in the reports discussed above. The House Committee requested that should FutureGen continue to maintain significant balances of unused funds or the project not continue, the Department should submit a report to both Appropriations Committees for approval to reprogram the balances for other coal research and development activities. In light of the restructuring of the FutureGen program described above, the Department does not anticipate that it will maintain significant balances of unused funds. To the extent such

balances are maintained, the Department will submit a report, as requested by the House Committee.

Under Strategic Petroleum Reserve Expansion, the Department is directed to use $25,000,000 to acquire land at a new site consistent with the budget request.

In accordance with the direction, the Department is performing geotechnical seismic research on the salt domes in the Richton, Mississippi site as well as performing engineering design and permit application and acquisition of real estate for the proposed new site.

Under Naval Petroleum Reserves, oil shale production, within available funds, $1,441,000 is directed for the Naval Petroleum Reserve #3 and $2,000,000 for Los Alamos National Laboratory (LANL) to support in basin scale environmental impacts for oil shale production.

The Department has provided LANL with funding to conduct basin scale environmental impacts for oil shale production.

GLOBAL ENERGY ASSESSMENT

Chairman Visclosky. Mr. Karsner, one of the specific directions given to your office was to take all remaining funding from the National Academy of Science Phase 3 study on Prospective Benefits of DOE's Applied Energy R&D programs and use those remaining funds for the Global Energy Assessment.

How much funding remained from the Phase 3 study as of the date of enactment of the FY2008 omnibus, and what is the status of transferring those funds to the Global Energy Assessment?

Mr. Karsner. As of the date of enactment of the 2008 Omnibus, $497,000 remains from the Phase 3 study. We expect to transfer funding to the GEA through the Energy Information Administration (EIA) contract vehicle, which is in process. The contract action requires a mutually agreed upon workplan, including specific deliverables, schedule and milestones to ensure effective use of the taxpayer dollars. We met with GEA principals last October and March of this year to exchange ideas on how best to move this concept forward. On the Committee's advice, we worked with Dr. Margaret R. Goud Collins and developed a strategy in which EERE would provide three resources to the GEA.

1. The first resource is a contract for $100,000 for the unique services and skills GEA could provide to meet our common mission. Dr. Goud Collins considered this amount and participation sufficient to the GEA purpose.
2. The second resource is to provide EERE expert participation in the GEA planning and activities (key staff met March 14th with Ged Davis, the GEA Co-President).

The third resource is to provide significant resources through sharing in kind EERE energy assessment resources including our state-of-the-art analytic tools and current studies that would be cost effective and benefit both organizations.

Chairman Visclosky. Why does your office believe it has the discretion to ignore such Congressional direction?

Mr. Karsner. There was no mention of the GEA in the EERE section of the Consolidated Appropriations Act, 2008; however, we are supporting the activity, consistent with the accompanying report language. The FY 2008 Omnibus only directs GEA support in its funding of the Energy Information Agency (EIA) budget line item. We believe we have developed an effective pathway to address completing this action.

BUDGET FORMULATION

Chairman Visclosky. Mr. Karsner, last fall your office hired a new headquarters support contractor. At the time, Committee expressed concern that the scope of work for this contract, as well as the contractor's website, indicated this support contractor would be involve in budget formulation. As you know, the Congress, the Department, and OMB all consider budget formulation to be a federal function.

Does this support contractor have any involvement in the preparation of the budget for your office? If so, what is the nature of that involvement?

Mr. Karsner. Unde r no circumstances do the contractors perform functions that are inherently governmental. The support contractor provides administrative and mechanical assistance that enables EERE professional staff to formulate all budgets leading up to the President's budget submission. EERE receives administrative support which includes: conference planning and support; word processing; spreadsheet development; graphics; desktop publishing; editing; filing; and other administrative functions, as required. Within the confines of the budget preparation, contractors do not formulate the budget or make policy or budgetary decisions. Their goal as support contractors is to process the input from EERE professional staff to deliver a final product.

Chairman Visclosky. Please provide for the record a copy of any input that this contractor provided to you to assist in the preparation of your FY2008 budget request.

Mr. Karsner. All decisions made for development of the FY 2008 budget request were made by DOE staff. Contractors were not allowed in the EERE budget decision meetings. We are unable to provide you with a copy of the input since the contractor's support are administrative and mechanical in nature. As noted previously, the support contractors do not provide input but provide support in formulating the budget. Examples of deliverables include: mechanical preparation of the Congressional Budget; associated funding tables; and graphics & budget roll-out material.

REGIONAL ENERGY CENTERS

Chairman Visclosky. Mr. Karsner, several years ago, this Committee supported the Department's recommendation to eliminate the DOE regional energy centers, although we still provide some grant funding to the State Energy Program offices. Now we have people asking us to fund something called Clean Energy Application Centers in the States.

If there are certain high-payoff activities that need to be coordinated at the State level, why don't we direct the State Energy Program offices to do that work, rather than establish any new layer of DOE-subsidized offices?

Mr. Karsner. The State Energy Program enables state governments to target their high priority energy needs and expand clean energy choices for their citizens and businesses. State Energy Offices use a variety of resources from DOE to effectively implement their energy projects and programs. In addition to financial assistance, states have access to technical assistance from National Laboratories and EERE RD&D programs.

Clean Energy Application Centers (previously named Combined Heat and Power Application Centers) help facilitate and support deployment of clean energy technologies. These renamed Centers are not new and they have been in operation since 2001. EISA 2007 changed the name of the Centers to allow for the implementation of a broader range of technologies beyond their primary focus on distributed energy generation and combined heat and power applications. The eight Clean Energy Application Centers assist with state implementation of industrial energy efficiency efforts in partnership with manufacturing and other businesses. These activities can be a complement to DOE's other R&D and deployment efforts.

Each Clean Energy Application Center provides essential applied research and development support, focused on the technology transfer and deployment of advanced clean energy technologies. They achieve this objective through a strategy of targeted education and outreach as well as specialized project technical assistance that goes beyond the capabilities of the State Energy Program offices.

USE OF ADDITIONAL FUNDING

Chairman Visclosky. In FY2007, Congress provided the Office of Energy Efficiency and Renewable Energy with an additional $300 million over the Administration's budget request. For FY2008, we provided your office with another $500 million over the request.

Please outline what additional research is being done with this nearly $800 million of additional funding?

Mr. Karsner. In FY 2007, funding beyond the request levels contributed to research and development in the following areas: biomass and biorefinery systems, advanced lighting, enhanced geothermal systems, concentrating solar power, plug-in hybrid and flex fuel vehicles, and wind energy, and others. In FY 2008, additional funding for renewable energy R&D went toward biomass and biorefinery systems, concentrating solar power, wind power systems integration, enhanced geothermal systems, and water power technologies. Also, additional FY 2008 funds contributed to hybrid electric vehicles, advanced combustion, vehicle materials technology, residential and commercial building technologies, advanced lighting, and industrial distributed generation.

Chairman Visclosky. How much clean energy will ultimately result from this added investment, and when will that investment payoff in terms of new alternative energy facilities?

Mr. Karsner. While EERE strives to make investments in clean energy technologies that have significant potential, the ultimate decision on commercialization of our technologies is made by the marketplace. That said, EERE has made tangible investments in clean energy technologies in areas such as advanced biofuels. To date, we have announced the selection of six commercial scale biorefineries and four smaller "10% of commercial scale" biorefineries for up to $499 million in DOE investment. On average, commercial scale biorefineries are expected take in 700 tons of feedstock per day, with an output of approximately 20-30 million gallons a year (MMGY) of cellulosic ethanol. The 10% of commercial scale facilities would take in approximately 70 tons of feedstock per day, with an estimated 2.5 MMGY. Therefore, we expect between 130 and 190 MMGY in cellulosic ethanol could be produced from these ten facilities.

FUNDING TO LABS, INDUSTRY, UNIVERSITIES

Chairman Visclosky. For your requested program in FY2007 and FY2008 and your planned program in FY2009, what percentage of your funding goes to national laboratories, how much goes to industry, and how much goes to universities? What are the percentages for the additional funding Congress provided in FY2007 and FY2008?

Mr. Karsner. For FY 2007, the percentage breakdown for funds obligated was: national laboratories 41%, industry 29%, universities 5%, and other 25% (which includes federal staff salary and benefits, support services, and state and local government funding). For FY 2008, our estimate, based on approved and planned amounts, is: laboratories 31%, industry 35%, universities 9% and other 25%. For FY 2009, our projection is: laboratories 37%, industry 41%, universities 7%, and other 15%.

The additional funds provided by Congress became part of the overall funds and were not differentiated from request level funds. Therefore, the additional funds would be proportional in terms of distribution to the percentages provided above.

FUNDING COMPETITION

Chairman Visclosky. What fraction of your EERE portfolio is competed via full and open competition?

Mr. Karsner. EERE's policy is to compete the requirements needed to support the Department of Energy mission, wherever possible. EERE processes awards under 10 CFR 600 and contracts under the Federal Acquisition Regulations. In addition, EERE's portfolio includes awards to and through the competitively selected National Laboratories. Approximately 30% of EERE's portfolio was competed via full and open competition in FY 2007. This represents the majority of the funds administered by the EERE Project Management Center (Golden Field Office and the National Energy Technology Laboratory). Over 40% of FY 2007 funds were administered by the National Laboratories. The Management and Operation contracts for the majority of the National Laboratories are awarded in a full and open competition. The National Laboratories compete the majority of the dollar value subcontracts through a full and open competitive process. In addition, EERE, in appropriate areas, is allowing National Laboratories to compete against the private sector and universities under DOE funding opportunity announcements. Approximately 17% of FY 2007 funds were administered through state formula grants and congressionally directed activities. Approximately 10% of FY 2007 funds were used for headquarter procurement activities and Program Direction. All of EERE headquarter procurement activities go through a competitive process consistent with the small business program.

Chairman Visclosky. Do you conduct any competitions in which the national labs have to compete against the private sector and universities?

Mr. Karsner. In general, EERE does not conduct competitions in which national labs have to compete against the private sector and universities. However, there are some exceptions. The Hydrogen Program, for example, has established a process in which the national laboratories compete against industry and universities through parallel solicitations using a common funding pool. Other EERE programs are beginning to adopt this approach in some technology areas.

FUNDING TO LOS ALAMOS AND SANDIA

Chairman Visclosky. I notice that your office provides a significant amount of funding to Los Alamos and Sandia national laboratories. I am sure that you are aware of the provision in the NNSA Act, Section 3220, which states that NNSA personnel and contractors "shall not be responsible to or subject to the authority, direction, and control" of anyone in the Department of Energy other that Secretary or the NNSA Administrator of the Administrator's designee.

How do you maintain adequate control over the funding you send to these NNSA laboratories when the law specifically says these labs are not subject to your authority, direction, and control?

Mr. Karsner. The process for controlling work for DOE organizations that are not part of NNSA is set forth in DOE Order 412.1A, *Work Authorization System*. The laboratory and EERE would prepare a work authorization setting out the objectives of the work, the funding available, schedules, deliverables, and other terms and conditions applicable to the work that are not otherwise established by the management and operating contract between NNSA and the laboratory. Once the laboratory and EERE reach agreement on the work authorization, it is forwarded to the NNSA site manager who must determine whether the work can be performed by laboratory without adverse impacts to the work the laboratory performs for NNSA. If the work authorization is approved, EERE would assign staff to oversee the work; any issues would be forwarded to the NNSA site manager or contracting officer for resolution. EERE's Project Management Center would provide project management and oversight functions to ensure that all program implementation activities with the laboratories are fully defined, promptly initiated and carried out successfully in pursuit of EERE program goals and objectives. Adequate coordination and oversight is readily maintained by EERE's ability to terminate project funding or deny future funding.

Chairman Visclosky. Do you give out EERE funding to any other contractor that has this legal impediment to your chain of command?

Mr. Karsner. No.

ENERGY EFFICIENT LIGHTING

Chairman Visclosky. Mr. Karsner, knowing of the importance of energy efficiency and the great energy saving benefits of solid-state lighting, such as Light Emitting Diodes (LEDs), why have you requested such a dramatic decrease in Emerging Technologies, Lighting Research and Development?

Mr. Karsner. The President's budget requests for FY 2008 and FY 2009 Solid State Lighting (SSL) funding are consistent at a level of $19 million. This Budget level adequately funds the efforts to ensure achievement of goals and priorities. The unrequested funding provided in FY 2008 above this level is being used to support achievement of the primary target of solid state lighting devices and technologies that can produce white light with efficacies in excess of 160 lumens per Watt in commercial products as well as to support further work on evaluating both inorganic light emitting diodes (LEDs) and organic light emitting diodes (OLEDs).

Chairman Visclosky. Realizing the importance of this program, last year, the House proposed approximately $39 million, unfortunately, the Senate agreed to a lower amount and the number was eventually reduced to around $24 million. However, this year, you are only requesting $19.1 million, even though $25 million is needed to maintain the funding of basic programs. Many worthwhile R&D projects have been funded in previous years, and with this cut, which programs or projects will you propose cutting?

Mr. Karsner. The Solid Sate Lighting sub-program is structured around competitive procurements, which take into account variations in the availability of funding for new projects. Competitively selected projects have durations of two to three years, and thus approximately one third of projects are ending in any given fiscal year, allowing for cash flow management through the competitive process. Each year the SSL program conducts a prioritization process where performers and members of the competitively selected Next Generation Lighting Industry Alliance review progress on funded projects, and provide input on the technical opportunities that should be continued, dropped, and started by the program. The SSL program management decides what the priority needs are that will be pursued through competitive procurements. To date, no projects have been cut due to a shortage of funding. A small minority of projects have not been continued due to a lack of technical progress after the conduct of peer reviews. This program has been highly productive with the funding provided, and is several years ahead of both its technical and commercialization objectives compared to initial program planning from the 2003 time frame.

ENERGY EFFICIENCY AND CONSERVATION BLOCK GRANTS

Chairman Visclosky. Mr. Karsner, the Energy Independence and Security Act of 2007 authorizes a new block grant program for states, local governments and tribes, with $2.0 billion annual appropriations for energy efficiency and conservation programs.

From DOE's perspective, what is the best way to proceed with this program?

Mr. Karsner. No regulations are required; the statute very specifically sets forth eligibility and other criteria. However, new funding for this program has not been appropriated and the Department has not requested funding for the program in the FY 2009 Budget.

Chairman Visclosky. How does this program compare with the existing state grant program in EERE? Is there some duplication of effort?

Mr. Karsner. Yes, there is duplication. DOE provides funding to local governments for activities such as those eligible for block grant funds through the State Energy Program (SEP). States use grants at their discretion to address their energy priorities for renewable energy and energy efficiency, and provide sub-grants to local governments within their borders.

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Chairman Visclosky. In the recently passed Energy Independence and Security Act of 2007, the Zero-Net Energy Commercial Buildings Initiative was authorized to receive $20 million this year. As you may know, the goal of the Zero-Net Energy Commercial Buildings Initiative is to have "net-zero energy" on all new commercial buildings by 2030, half of current commercial buildings by 2030, and all commercial buildings by 2050. Due to the fact that buildings consume so much energy, and emit large amounts of carbon into the atmosphere, what is the department's view this initiative? Why was no money requested for such an important initiative as this?

Mr. Karsner. The FY 2008 Omnibus Appropriations Act provided no explicit funding or report language directing implementation of EISA provisions in the current fiscal year. The FY 2009 Budget adequately funds a broad, balanced portfolio of renewable and energy efficiency, including R&D that supports achievement of the Building Technologies Program goals.

The Department recognizes the importance of pursuing the opportunity for improving energy efficiency, increasing renewable energy utilization, and reducing carbon emissions and other harmful environmental impacts resulting from business-as-usual construction, operation and management practices in the buildings sector. For over six years, the overarching EERE Building Technologies Program (BTP) goal has been to create the technical and economic capability to achieve net-zero energy residential and commercial buildings in all major climate zones. The President's FY 2009 Budget includes a funding request of $123.8 million to pursue this goal, coordinated with EERE programs developing on-site solar electric, wind turbine and other renewable technologies.

EISA Sections 421 and 422 essentially reauthorize ongoing activities of the BTP Commercial Buildings Integration sub-program. The Department announced a National Retail Energy Alliance on February 21, 2008 that includes major retailers willing to share best practices, technology needs and assessments, and to work together toward future net-zero energy solutions for their businesses. In addition, the Department is planning national Institutional (education, healthcare, state and local government) and Commercial Real Estate (owner-occupied and leased office space, and lodging) alliances. Together these alliances have the potential to encompass eighty percent of current and future commercial energy consumption.

The Department, through competitive solicitation, is planning on working with a number of national accounts to improve efficiency of their existing portfolio of buildings by greater than 20 percent, while at the same time providing technical assistance to develop next generation prototypes that exceed the American Society of Heating, Refrigeration and Air-conditioning Engineers 90.1 standard by fifty percent or more, and include renewable energy technology where economically justified. Already underway is a Commercial Lighting Initiative (CLI), in partnership with the Illuminating Engineering Society, International Association of Lighting Designers and the New Building Institute,

that combines the best of lighting technology with the best of lighting design to create scalable lighting solutions for commercial building applications. The CLI is coordinated with the alliances, with the first set of solutions designed for retail applications. The Department and the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) have signed a Memorandum of Understanding pledging collaboration to increase the stringency of the ASHRAE Commercial Model Energy Code 90.1 by thirty percent by 2010, and to develop a series of prescriptive Advanced Energy Design Guides (AEDGs) for a variety of building types. ASHRAE, in a break with past practice, is offering the AEDGs as a free download on its website.

The Commercial Buildings Integration sub-program progress noted above has been enabled by a steady increase in funding since FY 2006, when funding was approximately $4 million. In FY 2007 and FY 2008, the Department allocated $8.7 and $11.9 million, respectively, to the Commercial Buildings Integration sub-program, and is requesting $13.0 million in FY 2009 – an increase of over 300 percent from FY 2006 appropriated levels. This is significant given the substantial fiscal constraints in the overall Federal budget environment.

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Chairman Visclosky. Another important initiative authorized in the Energy Independence and Security Act of 2007 is the Bright Tomorrow Lighting Prizes. The purpose of this provision is to develop solid state lighting prizes that meets specified criteria: $10 million for a 60-watt incandescent replacement LED product, $5 million for a 38-PAR halogen replacement LED product, and $5 million for a 21st Century Lamp. As I stated earlier, LEDs are very promising, yet you have requested no money for this program in the budget, why? Additionally, how do you plan to administer this program? And finally, is the Department soliciting any private money for this program, as provided for in the Energy Independence and Security Act of 2007?

Mr. Karsner. On May 28, 2008, DOE announced details on the Bright Tomorrow Lighting Prizes (L Prize™) competition, the first government-sponsored technology competition designed to spur lighting manufacturers to develop high quality, high efficiency solid-state lighting products to replace the common light bulb. At this time we do not have an indication of interest, timing or magnitude of private sector funding for the Bright Tomorrow Prize.

ENERGY INDEPENDENCE AND SECURITY ACT OF 2007

Chairman Visclosky. The Energy Independence and Security Act of 2007 specifies that the Secretary of the Department of Energy must work with the National Electrical Manufacturers Association to monitor trends of certain exempted light bulbs which includes acquiring 16 years of sales and market data. This is a large task, and will be extremely expensive, yet you have neglected to request this funding, even though $10 million has been authorized, why? If the funding is not available, how will this market and sales data analysis be conducted, as required by law?

Mr. Karsner. Section 321 of the Energy Independence and Security Act of 2007 (EISA) directs the Department of Energy to carry out a program to promote energy efficient general service incandescent lighting which includes energy standards and consumer education programs. Section 321(a) directs the Department to work with the National Electrical Manufacturers Association (NEMA) to collect historical data of shipments (1990 through 2006) and actual sales data (2010 through 2025) for five classes of general service incandescent lamps. If actual sales data for any one of the five classes of lamps increases by more than certain specified levels, the Department is to conduct an accelerated rulemaking to establish an energy conservation standard for the specific lamp.

Section 321 of the EISA directs DOE to carry out a proactive national program of consumer awareness, information, and education that broadly uses the media and other effective communication techniques to help consumers understand lamp labels and make energy-efficient lighting choices. The Department regularly conducts and funds education and outreach campaigns for consumers that are expected to assist in the transition to more efficient bulbs. These activities are included in the FY 2009 budget request and are consistent with the goal of the EISA legislation. The Department has already undertaken a variety of consumer education outreach efforts related to lighting, including partnerships with 18seconds.org and Disney's *Ratatouille*. In addition, the Department is currently working with the Ad Council on a national energy efficiency campaign.

UNDERGROUND STORAGE OF CARBON DIOXIDE

Chairman Visclosky. Numerous studies (such as MIT's "Future of Coal" Study) have made it clear that meeting our future energy demands while averting serious climate change will be significantly more difficult without geological storage of carbon dioxide. Mr. Slutz, your office is planning to undertake, in the near future, a number of large scale tests of underground geological carbon dioxide storage, as part of Phase III of your Regional Carbon Sequestration Partnerships program.

Could you describe the plans for these tests in greater detail – starting with what the intended purpose of these tests will be – that is, what questions are these tests intended to address, and what role will they plan in making underground geological carbon storage possible?

Mr. Slutz. The large-scale underground geological carbon dioxide storage tests are designed to meet programmatic goals that will lead to the eventual commercialization of carbon capture and storage (CCS) technologies throughout the United States. DOE is developing a peer-reviewed plan to be completed this spring that will identify in greater detail the scientific and engineering test parameters to guide design and selection of large-scale tests. Questions to be answered include:

- Is the reservoir's storage capacity large enough for long duration commercial projects?
- Is the reservoir's injectivity appropriate for long duration storage?
- Will $CO_2$ be contained in the target formations?
- If not contained will $CO_2$ affect Underground Sources of Drinking Water, or be released to the atmosphere or both?
- How large is the $CO_2$ plume in three dimensions?
- How does pressure affect the $CO_2$ plume?
- Are there any hazards? If so how can we avoid them or reduce their impacts?
- What are the best practice manuals for site selection, characterization, operations, and closure practices?
- How can the public be engaged?

Each of these questions are being addressed by the field projects as they implement plans for site characterization, construction, permitting compliance, public outreach, operations, monitoring, closure, and post-closure monitoring. Research plans include proper scientific protocols for testing so that the research issues required to satisfy these goals are addressed. This approach is being implemented across all of the field tests so that at the end of the program, the DOE and stakeholders throughout the United States, and the world, are informed of lessons learned and best practices. These efforts will facilitate the commercialization of CCS technologies and the acceptance of CCS as a feasible means of climate change mitigation.

Chairman Visclosky. How many such tests are presently planned, and how was that number decided upon – is it supported by the science, technology and regulatory needs?

Mr. Slutz. DOE has made awards for five large-scale tests throughout the United States and Canada. DOE is developing a peer-reviewed plan to be completed this spring that will identify the scientific and engineering test parameters to guide design and selection of large-scale tests. Items to be addressed include: rate of injection, duration of injection, and number and phasing of tests.

The plan's guidance will be based upon several factors, including the range of depositional environments that need to be tested, the applied research and development and basic science that needs to be completed, the regulatory compliance issues that need to be addressed, the human capital necessary to commercialize this technology, and access to existing infrastructure to facilitate large-scale projects. $CO_2$ emission sources are widely distributed throughout the United States, and CCS is most effective where proven storage facilities are located relatively near emission sources. The wide range of depositional environments and associated cap rocks being tested by the large-scale field tests will affect the design, operations, and monitoring requirements needed for these different geologies. As stated in the Massachusetts Institute of Technology Future of Coal report, a large-scale field test could range from several hundred thousand to over a million tons depending on the target formation physical characteristics, such as permeability and thickness. Each project has the goal of injecting at least a million tons of $CO_2$ into a regionally significant reservoir. A significant effort has been expended on procuring $CO_2$ near major geologic sinks with industry and operators that are willing to support a demonstration of CCS technologies on their facilities. By addressing the six goals previously discussed, the field tests aim to prove that CCS can be deployed throughout the United States in a wide range of different geologies. A best practice manual for developing the most promising geologic sequestration opportunities in the United States and Canada will be developed at the end of the research.

Chairman Visclosky. Are the folks doing these tests working together and with scientists (including those supported by the Office of Science) to make sure that the necessary questions are answered?

Mr. Slutz. Yes, in many instances the researchers working on the large-scale field projects are from national laboratories and universities that are also working on basic geoscience projects funded by the Office of Science. In addition, the Offices of Science and Fossil Energy are working to bring together the researchers from the large-scale field tests and basic sciences area to identify future areas of collaboration and develop a peer-reviewed plan to be completed this spring that will identify the scientific and engineering test parameters to guide design and selection of large-scale tests. On March 12-14, 2008, these offices participated in a Symposium entitled, "Basic Research Relevant to Geological $CO_2$ Sequestration," where the supported researchers participated in discussions of ongoing work to help define and engage in areas of mutual collaboration.

Chairman Visclosky. At present levels of funding, when do you expect to have the information needed by regulators to come up with a permitting process that will enable commercial deployment of underground carbon storage in a timely fashion?

Mr. Slutz. The DOE and Environmental Protection Agency (EPA) have been working together over the past several years to share information from the Carbon Sequestration Core R&D Program and Field Tests. The information provided helped support the development of the "Class V Experimental Technology Well Classification for Pilot Geologic Sequestration Projects" guidance issued by EPA in March 2007. This guidance "provided information to States and EPA Regions to consider when permitting pilot projects." The EPA is developing regulations for permitting of commercial-scale Geologic Sequestration Injection Wells under the Safe Drinking Water Act. EPA plans to propose these regulatory changes in the summer of 2008. Lessons learned to support the regulatory development process will be available on a continuum during the large-scale field projects. As the projects move through the cycle from initiation through post-injection closure, they will report the data obtained and also develop best practice manuals for site characterization, construction, operations, monitoring, closure, and post closure assessment in different regions and geologies. Initial data from these field tests are expected around 2010, and additional data input will continue for several years. The results will provide regulators with needed information as they develop future regulations and refine the requirements for future commercial projects. EPA is currently planning to finalize the regulations for geologic sequestration of carbon dioxide in 2011.

Chairman Visclosky. What, if anything, can be done, in your estimation, to accelerate this program?

Mr. Slutz. DOE has already taken the significant step of accelerating the start of the Phase III large-scale test program from 2008 to 2007. The program is working aggressively to put these large-scale projects in place. Field projects require certain times for various activities, such as permitting, baseline characterization, procurement of compression equipment and pipelines, and field services. Once projects are underway, these activities can only be expedited to a small degree.

## $CO_2$ PLUME

Chairman Visclosky. Mr. Slutz I am told that storing the carbon dioxide emissions of a single large coal power plant underground will produce a plume of carbon dioxide underground which expands about fifty acres a year.

How well do we know where this carbon dioxide will go and what its fate is?

Mr. Slutz. This question is being addressed by the small and large-scale field tests and other projects that the Sequestration Program is supporting. Also, the oil and gas industry has more than 30 years experience in injecting large quantities of $CO_2$ into oil fields at a rate equivalent to about ten large coal plants. The Department of Energy is building on this technology to better understand the short- and long-term fate of $CO_2$ stored in geological formations (oil fields, deep saline formations and deep unmineable coal seams). The experience of the oil industry indicates we have the ability to undertake geologic $CO_2$ storage and the ability to predict and monitor the behavior of the injected $CO_2$. Existing simulators have the ability to predict the movement of $CO_2$ in oil reservoirs and these lessons learned are being applied to carbon dioxide storage projects. Information developed from large-scale field tests will help to validate these existing reservoir models and test new models that have been developed specifically for the storage of carbon dioxide in saline formations.

Chairman Visclosky. Could you also describe some of the regulatory issues that are raised by the uncertainty in the movement of the plume and describe how your program plans to address these issues?

Mr. Slutz. The $CO_2$ plume is a buoyant fluid when injected into deep saline formations. This will affect the area of review that must be considered when permitting a $CO_2$ storage project. The Sequestration program is characterizing its field sites to understand the architecture of the reservoir and its effect on plume migration and how the design of the wells and injection operations will help to limit the flow of $CO_2$ laterally. This is being accomplished through proper site characterization and modeling. The projects will also need to demonstrate containment of the $CO_2$ so it will not impact an underground source of drinking water. The field test program is using the detail characterization, knowledge of the regional geology, and extensive monitoring programs to demonstrate this at each of the field sites. Finally, the field test program will demonstrate that the well construction techniques used are adequate to protect migration of the $CO_2$ along the well bore. Again, the Sequestration program is working with the regulators and industry to design wells capable of operating at high pressures for extended periods of time, with cements that will not degrade substantially over time, and will maintain integrity during the life of operation and after closure. This will be demonstrated through a rigorous system of well integrity and other monitoring.

RISKS OF $CO_2$ STORAGE UNDERGROUND

Chairman Visclosky. Recent studies have shown that if we were to start storing all the carbon dioxide emitted from coal plants underground, we'd be pumping about 20 billion barrels of fluid underground every year – that's about as much oil as the world produces each year.

When you pump that much carbon dioxide underground, you must be putting stress on the rocks you are pumping it into – what are you doing to make sure that we're doing the science that will help us understand what that could do to the rocks and the geology – if it might cause earthquakes, or if it might be released?

Mr. Slutz. On a daily basis, the earth experiences thousands of earth-tides and mini-earthquakes that have very faint magnitudes. These earthquakes have no tangible effects and can hardly be recorded by normal instruments. Passive-seismic monitoring involves technologies to record this faint seismicity so as to infer the distribution of faults and fractures around the wellbore and map the flow pathways of fluids such as $CO_2$ away from injection locations. This monitoring can be accomplished without active seismic sources and surface impacts. DOE believes that the over 20 small-scale field projects and the large-scale storage projects under the Sequestration Program will contribute to addressing the question of induced seismic activity and the chance of leakage to the surface by installing and monitoring passive seismic arrays at several of the project sites. Carbon capture and storage operations are fortunate to have decades of industrial experience related to this issue. In the United States, there are currently approximately 144,000 wells injecting over 2 billion gallons of brine every day. This is about 15 billion barrels of fluid per year or the equivalent mass of over 2 billion tons of $CO_2$ every year. This activity does result in micro-seismic activity, most of which cannot be detected without sensitive instruments. The industry injecting these fluids has learned to monitor injection patterns or cease injection before seismicity would become a problem. The injection of $CO_2$ will have the same careful monitoring that industry has undertaken and should have the same results.

Chairman Visclosky. Is your research and development program looking for innovative ways to prevent this kind of pressure – for instance, we've heard talk that you might relieve the stress by finding a way to take out the salty water that's down there in those rocks already and do something with it?

Mr. Slutz. There are research programs investigating various techniques to upgrade brine to potable water, use the water for power plant cooling systems, or inject water in underpressurized or depleted formations. Such projects may help relieve the increasing demands on surface and groundwater. If $CO_2$ is injected into these formations, it can occupy the space created by withdrawal of the brine.

Chairman Visclosky. Could your office provide, for the record, a description of your program's strategy for understanding the science underlying the risks of geological

carbon storage, as well as how your geological storage program plans to assess those risks and identify novel ideas to deal with them?

Mr. Slutz. Commercial-scale geologic storage will require the development and implementation of an effective risk assessment and monitoring, mitigation, and verification (MMV) protocol tailored to each storage site. The Program has projects, including in-house research at the National Energy Technology Laboratory, that are addressing risk assessment involved with geologic storage. DOE is also part of several highly instrumented and studied international storage tests including Weyburn (Saskatchewan Province, Canada), In Salah (Algeria), and Otway (Australia). These field tests and the ones being led by DOE's Sequestration program identify risk factors and their potential will be translated into practical mitigation plans. MMV will be key in mitigation of risk and each pilot project is working to develop innovative MMV techniques, from nano-degree tiltmeters and satellite detection that can map millimeter changes in the earth's surface to high resolution geophysical imaging in order to detect $CO_2$ movement through the geologic storage site and evaluate potential leakage pathways. The goal is to understand $CO_2$ movement within the geologic storage formation, to understand potential leakage pathways, to monitor any potential leakage deep in the subsurface, and to develop mitigation plans well before $CO_2$ leakage becomes a risk at the surface or in shallow potable groundwater.

## $CO_2$ STORAGE FOR ETHANOL PLANTS

Chairman Visclosky. Looking at the near future, the least expensive and pure sources of carbon dioxide which are suitable for underground storage may not be emissions from coal power plants – instead, if may be from ethanol plants coming up across the country.

What are you doing to take advantage of these opportunities to accelerate the testing and deployment of geological storage of carbon dioxide?

Mr. Slutz. While it may be years before large quantities of captured $CO_2$ from power plants are available for geologic storage, there are other sources of relatively pure $CO_2$ available now that are suitable for underground storage. The Sequestration Program is beginning Phase III activities, which includes preparing for large-field tests of $CO_2$ storage. $CO_2$ injection for some of these tests will begin within a year. In order to accelerate the Phase III tests, it was necessary to find large, readily available sources of concentrated $CO_2$. As a result, most of the $CO_2$ is coming from non-power plant sources, such as ethanol and natural gas processing plants. For example, the Midwest Geological Sequestration Consortium will inject 1 million tons of $CO_2$ captured at an Archer Daniels Midland ethanol plant in Decatur, Illinois. The Southwest Partnership will inject several million tons from a natural gas processing plant in Colorado. These tests will demonstrate the viability of capture and storage from non-power plant sources, and will accelerate use of these opportunities.

RISKS OF $CO_2$ STORAGE UNDERGROUND

Chairman Visclosky. Last year, the DOE Office of Science held a pair of workshops on the basic science issues relevant to the underground storage of carbon dioxide to geological formations. A number of studies, including your own Carbon Atlas, have shown that geological storage is by far the most important option for dealing with the carbon dioxide emissions of coal power plants.

However, it doesn't appear that the Office of Fossil Energy bothered to participate in these workshops – what was the rationale for the Office's decision not to participate, given the importance of geological storage to the future of coal?

Mr. Slutz. The Office of Fossil Energy (FE) has participated in and will continue to participate in key meetings dedicated to geologic sequestration and the challenges facing sequestration, including workshops and meetings from within DOE along with those from other Federal agencies such as the Environmental Protection Agency, international groups (IEA Greenhouse Gas Programme), and non-governmental organizations (World Resources Institute) to name a few. Although the workshop referenced was not solely dedicated to geologic sequestration but included nuclear waste geoscience issues, FE encouraged and had participation by many of the researchers from national laboratories and universities of projects it supports. The science being discussed at this meeting was only one part of the science that needs to be addressed to enable geological sequestration to become a commercial practice. Many of the basic science issues identified at this workshop are being addressed by the DOE-FE researchers in our Core Research and Development Program and the Field Program. Beyond the basic science research needs identified in this report that relate to geological sequestration, FE is working on the applied research that is necessary for geological sequestration to be developed to the point at which it could be adopted commercially. The small- and large-scale field tests are critical to help validate the basic science, demonstrate the technologies at scale, and develop best management practices for a commercial industry. DOE believes that the subject meeting was important and encouraged our supported researchers to participate so that issues that were raised were integrated into the ongoing research projects if they were not already.

Chairman Visclosky. What are you doing to coordinate efforts on this issue with the Office of Science?

Mr. Slutz. The DOE FE and the Office of Science (SC) have been coordinating several activities on applied and basic geosciences research to take advantage of the strengths and missions of both organizations. Fossil Energy organized a series of briefings in August 2007, to introduce participants from the SC to the Sequestration Program and plans for the development of large-scale field tests. This led to several actions including: 1) the involvement of SC in crosscutting working groups between the Field Program on technical areas, such as monitoring, simulation, geology, and capacity estimates; 2) participation by the Field Program and FE in an SC geosciences symposium in March 2008 that was designed to facilitate opportunities for conducting basic research

at some of the large-scale sequestration project facilities; 3) collaboration on the development of a science protocol that will summarize the goals, needs for, and science being conducted by the Field Program; 4) participation by SC in Field Program annual program meetings and individual meetings in each of the regions; 5) participation in the External Scientific Peer Review of the large-scale field tests that will occur at the end of March 2008; 6) as well as several briefings to Dr. Raymond Orbach, the Undersecretary for Science, on the program goals and implementation.

CARBON DIOXIDE CAPTURE FROM EXISTING COAL PLANTS

Chairman Visclosky. I've been told that nearly 60% of our carbon dioxide emissions in electricity generation come from coal-fired power plants. However, the emissions from coal plants in use today are mixed in with a lot of other gases, which makes it costly and inefficient to separate out the carbon dioxide in order to store it.

Could you tell me about any recent breakthroughs or ideas from your R&D program that might help us reduce these costs and address carbon dioxide emissions from existing coal plants?

Mr. Slutz. While DOE has been carrying out small-scale research for a number of years on approaches for capturing $CO_2$ from new and existing pulverized coal (PC) power plants, this work was given increased emphasis in FY 2008 when DOE was directed by Congress to begin to focus on carbon capture technology for existing PC power plants under the Innovation for Existing Plants (IEP) Program. On February 14, 2008, DOE, through its National Energy Technology Laboratory (NETL), issued a Financial Opportunity Announcement (FOA) that specifically focused on the research and development (R&D) of $CO_2$ capture technologies for the existing PC technologies of coal power plants (with application to new and existing coal power plants). It is anticipated that new projects under this FOA will be awarded by the end of FY 2008.

Good progress is being made on those carbon capture projects awarded in FY 2006 that have potential application to both new and existing PC power plants. For example, the Georgia Institute of Technology has been working on a promising $CO_2$ sorbent that appears to be inexpensive to manufacture and can capture large volumes of $CO_2$ per unit of sorbent. NETL's Office of Research and Development is also developing a promising solid sorbent that is durable and has shown high $CO_2$ selectivity. The company, UOP LLC, is developing metal organic frameworks that are hybrid organic/inorganic structures with high porosity and $CO_2$ selectivity. All of these concepts are being worked on at the laboratory-scale and will need to be evaluated at a larger scale.

Chairman Visclosky. In your estimation, do you believe that the level of investment in these efforts in this direction is sufficient?

Mr. Slutz. In FY 2008, DOE, through its IEP Program, will invest $25-$30 million on advanced carbon capture and compression technologies for PC power plants. Funding for IGCC-specific CCS R&D in FY 2008 from DOE's Fuels, Gasification, and Sequestration Programs is approximately $13 million. This level of investment should be sufficient for several promising R&D pathways that could ultimately reduce the high cost of carbon capture.

THE STALLED RESURGENCE OF COAL

Chairman Visclosky. When I last spoke with your predecessor last March, there was a lot of talk going around about coal's resurgence in electric power generation – there were plans in the works to build around 150 new coal plants. Since then, we have seen a dramatic shift – I've seen reports suggesting that 60 of those plants were cancelled just last year.

Mr. Slutz, could you provide the committee with some perspective regarding these cancellations and what they might mean for the future of coal?

Mr. Slutz. Approximately 45 plants were either cancelled or postponed in 2007. Of those 45 plants, 31 had not yet received permits. It is not uncommon in the industry for "announced" projects to be cancelled or postponed.

Because postponements have accumulated over the last 5 years, nearly 20 GW of plants are now scheduled for 2012 commissioning. Recently, however, new plant capacity has only been installed at a rate of 1,000 to 1,500 MW per year. Therefore, additions of coal-fired capacity above that level in the near term are unlikely. Since the capacity of announced projects is well in excess of 1,000 to 1,500 MW per year, cancellations are to be expected.

Fourteen plants were cancelled or indefinitely postponed in 2007. Half of them were former TXU Corporation proposed coal-fired power plants slated for the Texas market. Aside from these seven cancellations, only seven others with significant progress (i.e., permitted or in construction) were cancelled or postponed.

Chairman Visclosky. Last year, the Annual Energy Outlook published by the Department of Energy's Energy Information Administration suggested that we would need to build about 135 new coal plants to address demand over the next decade. This year, the Energy Outlook is painting a drastically different picture, with only about four new large coal plants actually needed in that timeframe. With this drastic shift, it seems as if we have the opportunity to make sure that all this new coal capacity is met with clean coal plants with carbon dioxide capture and storage. What is the Department doing to make this a reality and how do you think Congress can help?

Mr. Slutz. The Department's Clean Coal Power Initiative and restructured FutureGen demonstration programs, which focus on commercial carbon capture and storage demonstrations, are expected to accelerate the deployment of clean coal plants with the capability to capture and safely store carbon dioxide.

MIDWEST REGIONAL CARBON SEQUESTRATION PARTNERSHIPS

Chairman Visclosky. Mr. Slutz, I understand you have already made awards for several Phase III regional carbon sequestration partnerships, but there are three remaining partnerships with awards still pending. What is the status of the three remaining partnerships (one of which is in Ohio) and what is the Department's plan for making the remaining awards?

Mr. Slutz. DOE has made awards for five Phase III Large Volume Sequestration at four of the Regional Carbon Sequestration Partnerships (RCSP). Depending on the results of a scientific needs assessment being conducted in FY 2008 and the ability of additional project proposals to meet those needs, additional projects may be awarded in FY 2008 or FY 2009. The remaining three Phase III projects are in the process of being evaluated. The evaluation process requires finalizing the technical scope of the project along with undertaking a scientific evaluation and cost analysis of the proposed projects to verify their appropriateness within the overall objectives of the Sequestration Program. Independent cost verification is being undertaken by DOE to ensure the project costs are adequate prior to award. Independent cost reviews of the projects that have received awards have been completed. An independent technical review was conducted at the end of March 2008. This technical review, conducted by an internationally renowned group of experts, compared the proposed test plans against the program needs in order to develop an integrated portfolio of robust tests. Written results of this peer review are expected at the end of April 2008. DOE is conducting these reviews and plans to evaluate award of the remaining Phase III Projects based on the results of the scientific evaluation. The estimated time-frame for evaluating the remaining awards is the summer of FY 2008. The Sequestration Program budget is available to fund these awards.

Chairman Visclosky. Given the history on the FutureGen Project, do you foresee the Department fulfilling its plans to have each of the regional partnerships proceed through final demonstration and data collection? Or should these regional partners worry that the Department will pull the rug out from under them?

Mr. Slutz. There is widespread agreement that the activities of the Sequestration program, including large-scale storage demonstrations, will help ensuring public confidence in the safety and long-term viability of this option, and for supporting the development of regulations under which $CO_2$ storage will take place. Based on the overwhelming support for these activities from the Administration, Congress, industry, academia and prominent environmental organizations, we are confident that the Sequestration program's demonstrations will continue to receive support consistent with their objectives.

FUTUREGEN II AND OTHER DOE CARBON CAPTURE PROGRAMS

Chairman Visclosky. The changes proposed to the FutureGen program seem to erode what was once a unique facility designed to develop, test, and promote IGCC-based carbon capture and sequestration (CCS) systems. Now there doesn't' seem to be much of a difference between the new proposed program and other DOE CCS programs.

In addition to the $156 million requested for FutureGen, you request $69 million for Advanced Integrated Gasification Combined Cycle activities. According to the justification, this project will continue to develop technologies that will be "an integral part of carbon capture and storage demonstration project."

Please explain how this program differs from the new FutureGen proposal.

Mr. Slutz. The restructured FutureGen approach proposed by the Office of Fossil Energy is focused on addressing the issue of ultimately reducing emissions of carbon dioxide ($CO_2$) through multiple demonstration projects capable of carbon capture, separation, storage, and potential reuse as opposed to a single project. FutureGen responds to the growing climate change concerns that have created hurdles to siting coal-based power plants. The restructured approach will addresses these concerns earlier (rather than later) by accelerating demonstrations of Integrated Gasification Combined Cycle (IGCC) or other advanced technology coal power plants with carbon capture and storage (CCS) technology. In addition, the restructured FutureGen approach will address technical integration of CCS with power plants, a need for gaining operational experience (including cost and reliability data), siting, and permitting challenges to coal plants that are having difficulty in those jurisdictions that are requiring CCS for coal plants and $CO_2$ storage. This restructured approach offers the opportunity to evaluate large-volume sequestration in multiple geographic settings and geologic formations.

The Advanced IGCC Program is focused on developing advanced technologies to be deployed in integrated systems that would enable IGCC (as well as other gasification-based processes such as coal-to-liquids, coal-to-substitute natural gas, and coal-to-chemicals), to be the economically optimal clean choice for near-zero atmospheric emissions coal plants of the future. The program is focusing its research and development (R&D) activities on improving the economics and thermal efficiency of gasification-based plants by broadening the fuel flexibility advantages of gasification systems to economically process a variety of coal types and other carbon-based feedstocks. The Program is also focusing on the development of advanced technologies, including ion transport membranes for air separation, coal feed pumps, and high temperature synthesis gas cleaning and conditioning.

The Coal R&D Program, which includes the IGCC Program, is developing the core technologies that will require testing in commercial scale settings like FutureGen and the Clean Coal Power Initiative. These combined initiatives are designed to take technologies from concept to commercial availability. Such a result will enable coal to

meet our Nation's pressing energy needs in an environmentally sustainable and cost optimized manner, including full integration with carbon capture technologies.

Chairman Visclosky. It seems like this program might pay to develop the technologies, while the FutureGen program will pay to deploy them in test sites. Could you explain briefly for the Committee how the difference components of the DOE CCS programs fit together? Also, please provide for the record a more detailed comprehensive CCS program description.

Mr. Slutz. The Department of Energy is taking a leadership role in the development of CCS, or sequestration technologies. Through its Carbon Sequestration Program that is managed within the Office of Fossil Energy and implemented by the National Energy Technology Laboratory, sequestration technologies are being researched to overcome barriers to widespread deployment and to become an effective and economical option for reducing $CO_2$ emissions.

The Carbon Sequestration Program leverages applied research with field demonstrations to assess the technical and economic viability of sequestration. The Program has two main elements: Core R&D and demonstration and deployment. Core R&D involves laboratory and pilot-scale research aimed at developing new technologies and new systems for greenhouse gas mitigation. The Core R&D effort encompasses five focus areas: $CO_2$ capture, carbon storage; monitoring, mitigation, and verification; non-$CO_2$ greenhouse gas control; and breakthrough concepts. The demonstration and deployment element of the Carbon Sequestration Program is designed to demonstrate the viability of sequestration technologies at a scale large enough to overcome real and perceived infrastructure challenges. The largest component of the demonstration and deployment element is the Regional Carbon Sequestration Partnerships Program. These seven partnerships are examining regional differences in geology, land practices, ecosystem management, and industrial activity that can affect the deployment of CCS technologies.

New and advanced technologies will be tested in the field to identify and eliminate technical and economic barriers to commercialization. Projects selected under the restructured FutureGen Program will employ information and best practices gained from the technologies developed and proven in the large-scale field tests to implement the carbon capture portion of the project.

In addition to working within the Office of Fossil Energy, the Sequestration Program has been collaborating with other offices within the DOE as well as with other agencies. These include: 1) DOE's Office of Science, Geosciences Research Program, which supports research of fundamental earth processes that can be used as a foundation for efficient, effective, and environmentally sound use of energy resources and an improved scientific basis for advanced energy and environmental technologies; 2) the U.S. Department of Agriculture in terrestrial sequestration; 3) the Environmental Protection Agency in geologic sequestration; and 4) the U.S. Geological Survey through many of its applied R&D projects. Programmatic details are available in several documents,

including "A Carbon Sequestration Technology Roadmap and Program Plan" that is updated on a yearly basis.

IGCC CCS VS PULVERIZED COAL (PC) CCS

Chairman Visclosky. While IGCC systems may be the coal plants of the future – and there is some question of that, given their higher cost to build – the coal plants of TODAY are pulverized coal (PC) systems. In order to get a handle on carbon emissions, we need to develop systems to efficiently and effectively capture carbon emitted from the current fleet of plants. However, it seems as if your CCS investment strategy is heavily weighted in favor of IGCC plants.

What is the actual balance of investment between CCS for PC plants and for IGCC plants?

Mr. Slutz. In FY 2008 DOE, through its Innovations for Existing Plants Program, will invest between $25-$30 million on advanced carbon capture and compression technologies for the existing fleet of pulverized coal (PC) power plants. Funding for integrated gasification combined cycle (IGCC)-specific carbon capture and storage (CCS) research and development (R&D) in FY 2008 from DOE's programs is approximately $13 million.

Chairman Visclosky. Why is this the correct balance?

Mr. Slutz. Existing plants may need CCS depending on whether limits on $CO_2$ emissions are implemented, the stringency of potential limits, and the cost of PC CCS technology. IGCC plants have the opportunity to capture $CO_2$ at a much higher concentration than PC post-combustion, thus facilitating "affordable" capture. Thus, both technologies should continue to conduct CCS research. In light of existing R&D budgets and funding priorities, this is considered an appropriate balance.

Chairman Visclosky. Does DOE have any analysis to show that an additional dollar of investment in IGCC CCS technology is a better investment than an additional dollar into PC CCS technology?

Mr. Slutz. In support of both program areas, DOE has conducted several analyses that show the impact on cost and efficiency of requiring CCS to be deployed on existing plants and IGCC systems. These analyses help guide R&D of advanced capture technologies that can lower costs and minimize impacts on plant efficiency. Further, DOE conducts an annual assessment of the benefit of its coal research program using the Energy Information Administration's National Energy Modeling System. These analyses clearly demonstrate the benefit of conducting research on both IGCC and PC CCS technologies. In addition, potential future carbon constraints seeking to stabilize atmospheric $CO_2$ at specified levels may necessitate cost-effective CCS technologies for new coal-based systems including IGCC as well as existing PC plants.

OIL AND NATURAL GAS RESEARCH

Chairman Visclosky. We hear a lot about "reducing reliance on foreign sources of oil" in these hearings. I'm all for supporting innovative sources of energy and improving use efficiencies. The other side of the equation, though, is to increase the supply of domestic sources of oil and gas. The budget request before us, however, has cut out all support for those activities.

Are we really extracting oil and gas as efficiently as we can? Are there no technologies that could possibly be developed that would improve our ability to rely on our own sources of oil and gas?

Mr. Slutz. The efficiency of oil and gas production has increased significantly over the past few years. This allows operators to produce more of the oil in existing reservoirs as well as to find and produce oil and gas from deeper and more geologically complex reservoirs. For example, oil in the Bakken shale formation, which underlies parts of North and South Dakota and Montana, was not considered economically feasible to produce until 2000. Since then, over 800 million barrels of Bakken additional recoverable oil has been found using new drilling and completion technology.

We can expect that industry will continue to develop and apply new technologies to boost domestic recovery efficiencies. Oil and gas are mature industries and both have every incentive, particularly at today's prices, to enhance production and continue research and development of technologies on their own. There is no need for taxpayers to subsidize oil companies in these efforts.

ENERGY STORAGE

Mr. Visclosky. The FY 2009 budget request reflects an increase of $6.7 million over the FY 2008 request and enacted levels, for improved energy storage devices and systems at utility scale, for a total of $8.8 million. What are the applications for this type of technology?

Mr. Kolevar. The President's budget request represents the Department's commitment to further storage technology as an important component of the modern electrical grid. Applications of energy storage technology include improved utilization of utility assets, reduction of peak loads and congestion, improved power quality for the digital economy, and reduced carbon emissions by enabling dispatchability of variable renewable generation.

Mr. Visclosky. Is this research cost-shared with industry, or the utilities?

Mr. Kolevar. The energy storage program currently partners and receives cost share from state energy agencies, industry, and utilities in pre-commercial demonstration projects. Partner cost share ranges from 60% to 80% for most projects.

SECURE SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA)

Mr. Visclosky. The Visualization and Controls account develops advanced technologies to enhance the cyber security of control systems. We know that this research has applications for grid security, a DOE responsibility, and it is also for other missions for Department of Homeland Security, which has an overall cyber security mission. Are you coordinating with DHS on these matters, so you are not duplicating efforts?

Mr. Kolevar. We have worked very closely with the U.S. Department of Homeland Security (DHS), other Federal agencies, and the private sector for several years to coordinate activities and avoid duplication. OE uses several mechanisms and forums to do this, such as: the Energy Sector Control Systems Working Group (ES-CSWG); the *Roadmap to Secure Control Systems in the Energy Sector*; the Cross-Sector Cyber Security Working Group (CSCWG); the Federal Control Systems Working Group (Federal Partners); and the Process Controls Systems Forum (PCSF).

Through the Critical Infrastructure Partnership Advisory Council framework, OE has formed the ES-CSWG. The working group includes representatives from DOE, DHS Science and Technology Directorate (S&T), DHS National Cyber Security Division (NCSD), the Government Coordinating Council for Energy, the Electric Sector Coordinating Council, and the Oil & Natural Gas Sector Coordinating Council. It identifies and implements high-priority activities in the *Roadmap to Secure Control Systems in the Energy Sector* and recommends critical areas for investment to foster private and public collaboration focused on improving control system security in the energy sector. The Working Group helps these key security partners leverage their activities and avoids redundancy.

DOE-OE has also been a leader in the Federal Partners to coordinate Federal control systems security efforts. Formed by DHS, Federal Partners represents Federal agencies with control systems security programs that are seeking to reduce the cyber risk of control systems. OE participated in the first meeting and was an architect to develop close ties among the Government agencies. OE and DHS are currently working with the Federal Partners to map all Federal control systems security activities as a part of the developing Federal Coordinating Strategy for Control Systems. The strategy provides an overarching vision for coordination and identifies effective coordinating mechanisms.

OE also works closely with DHS through the Process Controls Systems Forum, a cross-sector venue for information sharing among public and private organizations. OE served on the initial governing board of this forum and regularly contributes to its newsletters, library references, annual meetings, and working group activities. Through this forum, OE works with DHS to communicate program initiatives to all facets of the energy sector security community.

Mr. Visclosky. We would like to point out that the SCADA activities started out as a subcommittee 'earmark,' but in your wisdom, embraced it as a programmatic necessity in the later budget requests. Tell us where that R&D stands, and how it has contributed to your program.

Mr. Kolevar. Over the last 5 years, the National SCADA Test Bed (NSTB) has made substantial progress, both technically and in building the public-private partnership. Recently, NSTB was cited as one of six Government programs in cyber security that is obtaining tangible results by the SANS Institute. Five SCADA system vendors have developed next-generation hardened systems as result of NSTB cyber security assessments, one vendor's system has been purchased and placed in operation at 21 sites, and five software patches have been issued (and downloaded by 82 utilities) to better secure existing systems.

In FY 2007, OE used part of its discretionary budget for SCADA activities to accelerate the commercialization of next-generation control systems technology. DOE issued a competitive solicitation and awarded five cost-shared research projects to private sector teams. These projects are developing technologically advanced controls and cyber security devices that will be integrated into the U.S. electric grid and energy infrastructure.

The NSTB, part of OE Control Systems Security, is a key contributor to DOE's mission to enhance the security and reliability of the U.S. energy infrastructure. As the Nation continues to modernize the electric grid, the security of the cyber systems that control power generation, transmission, and distribution has and will continue to become increasingly important. DOE will continue to ramp up efforts to meet the substantial and acute challenges of securing control systems to ensure a reliable and resilient energy infrastructure.

MULTI-DISCIPLINARY ORGANIZATION

Mr. Visclosky. Mr. Kolevar, your office is responsible for the national transmission congestion study every three years (next is August 2009); research for the grid modernization and renewable energy integration in the national grid; and infrastructure security and energy restoration- all on a budget of $134 million. Of all of these activities, where should the Department be providing more resources in the future?

Mr. Kolevar. OE provides a critical role in supporting emergency preparedness and developing future technologies to increase the reliability and security of our Nation's energy infrastructure. All our efforts are equally vital to maximizing the penetration of renewables and other clean generation, analyzing energy security issues, and providing emergency response. The Administration has recognized the priority areas with increases in the Fiscal Year 2009 request. Overall, the Department requests an increase of $19 million dollars compared to the Fiscal Year 2008 request.

Mr. Visclosky. Your Office seems to be a "catch-all" for many activities- do you have any comments on how the organization could be better structured?

Mr. Kolevar. The organization of the Department can be structured or restructured in various ways in order to perform the functions and achieve results, in accordance with the mission of the Department, as defined by the President, the Secretary, and authorized by Congress. OE has repeatedly demonstrated an ability to meet its milestones and deliverables, and has have done so thoroughly and effectively. Rather than being a "catch-all", OE was organized to unite, in a single departmental organization, the numerous and varied functions of the Department relating to the Nation's electric transmission and distribution network, and electricity policy. These functions include the Department's activities concerning electricity-related research and development, infrastructure security and energy restoration, and national electricity policy and permitting issues. The Department recognizes that the electric infrastructure is and will continue to be a critical energy asset that requires modernization, investment, protection, and prompt restoration in event of disruption, and OE was specifically created to concentrate all of the Department's functions related to assuring the national goals in that regard.

GRID VULNERABILITIES

Mr. Visclosky. Mr. Kolevar, your budget request notes that your office is developing a North America-wide monitoring system for the electricity grid. This system is apparently intended to help assure the reliability and security of the Nation's power grid. We recognize that this system will rely upon sensitive information gathered from the nation's utilities, and that utilities might not want to make such information available to an agency with regulatory powers. However, some of the weaknesses that you identify might be expensive and difficult to implement. You have no regulatory powers and no legal authority to force action. I guess I'm worried that we're setting ourselves up for a situation in which we know about problems, but we don't have any way to do something about them. When you find problems, how does the U.S. government work with the utilities to fix them?

Mr. Kolevar. This depends on the nature of the problem. If the problem is technical, DOE can work directly with the utility to transfer technology solutions developed by DOE. If the problem arises from conditions that violate the mandatory reliability standards that are promulgated and enforced by the Electricity Reliability Organization (ERO), operated by the North American Electric Reliability Corporation (NERC) under the authority of the Federal Energy Regulatory Commission (FERC), the ERO or FERC can assess penalties against the utility as being out of compliance with the standards.

Mr. Visclosky. Who should pay?

Mr. Kolevar. The utility would pay the cost of any technology upgrade or change in operations necessary to bring their system into compliance with the reliability standards.

Mr. Visclosky. Since you have no regulatory authority, how would you propose to impel a utility which does not want to make necessary upgrades?

Mr. Kolevar. If the problem is a standards violation as described above, the risk of repeated and more severe penalties by the ERO or FERC would provide incentive for the utility to make the upgrades. In general, the North American wide-area monitoring system being developed and deployed under DOE and NERC leadership will make substandard operation by any one utility visible to other utilities in the interconnection and to NERC. This wide-area visibility and situational awareness would tend to impel the utility to make upgrades in the face of peer pressure to avoid operating in a manner that would jeopardize the safety, reliability or security of the grid.

Mr. Visclosky. Congressional Research Service has found that the responsibilities of your office overlap with those of the Department of Homeland Security. The Department of Defense also has significant responsibilities in identifying and resolving critical infrastructure vulnerabilities. Please provide for the record all active interagency agreements, MOUs, or strategy documents which determine or describe the division of

responsibility among DOE, the Department of Homeland Security, and the Department of Defense.

Mr. Kolevar. There are two key policy/strategy documents which describe responsibilities of the Department of Energy as the Sector Specific Agency, or lead agency for the energy sector. These are the National Infrastructure Protection Plan (NIPP) released by DHS in 2006 and the DOE led the NIPP Energy Sector Specific Plan (SPP) released in May 2007.

DOE was heavily involved in the development and review of the National Infrastructure Protection Plan starting in 2004 until its release in 2006. We led the development of the Energy SSP with participation on writing teams by other Governmental sector partners as well as private sector partners through the Oil and Gas Sector Coordinating Council and the Electricity Sector Coordinating Councils which represent well over 95 percent of their respective sectors under DHS' Critical Infrastructure Protection Advisory Council (CIPAC).

Under Homeland Security Presidential Directive 7, DOE was designated as the sector lead for energy. To that end, DOE works closely with DHS in the identification of critical assets and in encouraging and supporting assessments of risk and vulnerabilities. The Energy SSP describes the numerous efforts that are currently underway in cooperation with energy sector security partners which are updated in the 2007 DOE Annual CIP Report to DHS.

DOE is the Co-Chair (along with an industry representative) of the Joint Energy Sector Coordinating Council under the Critical Infrastructure Protection Advisory Council (CIPAC) and Chairs the Energy Government Coordinating Council (EGCC) with representatives from Federal, state and local and tribal organizations.

The objective of the Energy GCC is to provide effective coordination of energy sector security strategies and activities, policy, and communication across Government and between the Government and the sector to support the nation's homeland security mission. It acts as the counterpart and Governmental sector partner to the private industry-led Electricity Sector Coordinating Council and the Oil and Natural Gas Sector Coordinating Council to plan implement and execute sufficient and necessary sector-wide security programs for the nation's Energy Critical Infrastructure. The Council plays a coordination role responding to issues resulting from a terrorist act or natural disaster of national significance impacting the energy sector. The EGCC is an advisory, consensus-building group and does not in any way encroach upon or abrogate the legal or regulatory responsibilities of the participants.

The DOE representative on the Council will serve as its chair and provide leadership for the EGCC's activities and meetings. In cooperation with other participants, DOE will collect from other members and initiate or bring issues to the EGCC for consideration and discussion. We will monitor and ensure that issues are fully considered and if possible brought to closure working with other council members. The Council is not a

decision making body but will seek to develop a consensus on issues and make recommendations. Workgroups are established on an ad-hoc basis when substantial investigation, research or other tasks are required which cannot be achieved at a regular EGCC session. All products of the workgroups will advise council members on various issues, directions and processes.

Attached: DHS, National Infrastructure Protection Plan (2006)

NATIONAL INTEREST ELECTRIC TRANSMISSION CORRIDORS

Mr. Visclosky. Mr. Kolevar, could you give us an update on the National Interest Electric Transmission Corridors issue? On March 6, DOE issued a notice denying further rehearings on the initial NIETC designation. This decision, much like the first one designating NIETCs to begin with, is not likely to be popular with many up here in Congress. Please explain the consequences of this latest decision. What are the next steps?

Mr. Kolevar. The DOE order, with an effective date of March 11, 2008, denying applications for rehearing and denying requests for stay was a final agency action under section 216 of the Federal Power Act (FPA). (Section 216 was added to the FPA by section 1221(a) of the Energy Policy Act of 2005). From that date, parties that requested rehearing have sixty days to appeal to a U.S. Circuit Court of Appeal for review of the Department's October 5, 2007 National Electric Transmission Congestion Report and Order, which designated two National Corridors. The effective date of the National Corridor designations remains October 5, 2007. It is our understanding that suits have been filed in the Second Circuit, the Fourth Circuit, and the Ninth Circuit Courts of Appeal of the United States.

Section 216 of the FPA provides that the an applicant seeking to construct or modify an electric transmission facility in a National Corridor may, under certain conditions enumerated in section 216(b) of the FPA, apply to the Federal Energy Regulatory Commission (FERC) for a permit to build or modify the facility. However, section 216(b) also provides generally that FERC may not issue such a permit for at least one year after the filing of an application pursuant to state law or one year after the designation of the relevant National Corridor (October 5, 2008, in the case of the two National Corridors), whichever is later.

The Department does not opine on the circumstances under which FERC would accept an application for a permit or grant a permit under section 216(b). However, we note that FPA section 216 does not exempt any applicant for a federal permit to construct or modify an electric transmission facility, or FERC, from complying with the applicable requirements of Federal law, including the requirements of environmental, natural resources, endangered species, and historic preservation statutes. In addition, if the proposed facility would be sited on Federal or State property, the applicant would also have to obtain all necessary authorizations from the appropriate Federal or State land agencies.

Mr. Visclosky. What process did you go through to arrive at the decision? Considering what information?

Mr. Kolevar. DOE carefully examined and considered each of the 60 or more requests we received for rehearing. We found that the bulk of these requests focused on concerns that we had addressed conclusively in either our draft designation of the National Corridors (published May 7, 2007), or our final Report and Order of October 5, 2007.

Some of the requests for rehearing, however, raised new concerns or new lines of reasoning. We evaluated these new concerns and found these arguments for rehearing unpersuasive. In the Department's March 6, 2008, Order Denying Rehearing, we explained in detail the reasons for rejecting the arguments raised.

Mr. Visclosky. Is there anyway to appeal this decision?

Mr. Kolevar. Parties who both appropriately filed comments on the May 7, 2007, notice soliciting comments on two draft National Corridor designations and who timely filed requests for rehearing of the October 5, 2007 Congestion Report and Order who wish to challenge DOE's designations have sixty days to appeal from the issuance of the Order Denying Rehearing. Pursuant to section 313 of the Federal Power Act, these parties may appeal to the U.S. Circuit Court of Appeals of the District of Columbia or any other U.S. Circuit Court of Appeals in which they have standing.

QUESTIONS FROM REPRESENTATIVE OLVER

BUILDING AMERICA PROGRAM FUNDING

Mr. Olver. Mr. Karsner, I commend the Department's requested increase for the Building America program, which focuses on bringing zero energy homes to our nation's building stock by 2020. I have witnessed the fruits of this program in my own district where members of the Consortium for Advanced Residential Buildings (CARB) team have provided assistance to Rural Development Inc for building nationally recognized near-zero net energy single family homes. However, I have heard many concerns that a significant percentage of this program's funding is not reaching the Building America Teams and Lead National Laboratories and is instead being redirected to other DOE programs. Can you please tell this committee how much of the appropriated funding is going to the Teams and lead labs? Where is the rest of the money going?

Mr. Karsner. The Building America Program is funded out of the Residential Building Integration Research activity within the Building Technologies Program. These funds primarily went to the teams to support research towards achieving net-zero homes and documenting the research results. Funds to the National Laboratories are used primarily to provide technical support to the research teams. Funding to the teams and national laboratories can vary from year to year as funds are allocated to the highest priority projects using a merit-based review process.

The increase in funding this year enables the Department to increase the dissemination of the research results to builders, trades and homeowners in three major areas: an industry challenge, higher education, and homeowner outreach. Foremost is the launch of the Builders Challenge, announced by Secretary Bodman on February 13, 2008, at the International Builders Show. This is a new initiative to increase the number of highly efficient homes that are built each year through partnerships with existing programs, providing technical and marketing support to builders, and recognition and rewards to builders contributing the most to reduce energy use in the residential sector. Additionally, for the last three years DOE has worked with the National Association of Universities and Land Grant Colleges to develop building science courses for architects and engineers. This year outreach is also being expanded to homeowners through the Extension Service.

The total FY 2008 funding for Residential Building Integration sub-program is $23.659 million. The amount dedicated to teams and lead labs is $19.8 million.

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