

**CONTRACT MANAGEMENT BY THE DEPARTMENT  
OF ENERGY**

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**HEARING**

BEFORE THE

SUBCOMMITTEE ON FINANCIAL AND CONTRACTING  
OVERSIGHT

OF THE

COMMITTEE ON  
HOMELAND SECURITY AND  
GOVERNMENTAL AFFAIRS  
UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

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## **CONTRACT MANAGEMENT BY THE DEPARTMENT OF ENERGY**

**THURSDAY, JUNE 27, 2013**

U.S. SENATE,  
SUBCOMMITTEE ON FINANCIAL AND CONTRACTING OVERSIGHT,  
OF THE COMMITTEE ON HOMELAND SECURITY  
AND GOVERNMENTAL AFFAIRS,  
*Washington, DC.*

The subcommittee met, pursuant to notice, at 10:30 a.m., in room 342, Dirksen Senate Office Building, Hon. Claire McCaskill, Chairman of the Subcommittee, presiding.

Present: Senators McCaskill, Begich and Johnson.

### **OPENING STATEMENT OF SENATOR MCCASKILL**

Senator MCCASKILL. Good morning. This hearing will now come to order.

Today's hearing will focus on contract management by the Department of Energy (DOE). This is an area of contract management that has not received enough attention from Congress. I expect that this will only be the first in a series of hearings by this Subcommittee that will look at how other agencies are managing taxpayer dollars.

This hearing will focus on the Department's Office of Environmental Management (EM). The Office of Environmental Management is responsible for cleaning up the nuclear waste that is a legacy of America's nuclear weapons work in World War II and the Cold War. No one questions the need to do this work, but when hundreds of billions of taxpayer dollars are at stake, we need to make sure that those dollars are not just being squandered.

EM's environmental cleanup is currently estimated to cost \$270 billion and to continue beyond 2087. Since 1990, EM has received nearly \$150 billion to carry out its mission, and all the work of cleanup—managing the sites, developing the technology, building the facilities and processing the waste—is done by contractors.

This heavy reliance on contracting is troubling because the Department of Energy's contract management has been on the Government Accountability Office's (GAO) High Risk List since 1990—the year the list began.

In 2003, over a decade ago, GAO identified the Department's choice of contract type, use of competition, measurement of contractor performance, cost overruns and schedule delays as major problems for the Department's contracts. Today, 10 years later, little has changed.

EM relies on cost-based contracts for most of its environmental remediation work. This is an improvement over the large management and operations contracts the Department used to use.

However, the government bears the risk for all cost overruns on a cost-based contract, making these vehicles very risky for the government. The cost overruns on just one project—the waste treatment plant at Hanford—now total almost \$10 billion since the contract was awarded.

Using cost based contracts is especially risky for EM because up until just a few months ago EM did not even have a requirement that there be a cost estimate. There is still no requirement that the estimate be well documented or accurate. As one GAO official told the Subcommittee staff last month, “You can just write a number on a piece of paper, and that would meet the requirement.”

EM also has failed to adequately consider safety during the design phase of the planning process. When these issues are finally discussed, these projects are already in the construction phase, which then requires extensive contract modifications and billions more in dollars to be spent.

For example, the cost of a Salt Waste Processing Facility (SWPF) at the Savannah River site has increased from an original cost estimate of \$340 million to \$1.2 billion in part because of numerous modifications that had to be made to the design.

EM also relies on the same contractors for all of its projects. These contractors even refer to themselves as “competimates,” meaning that they may be competitors for one project but joint venture teammates on another. This lack of competition does not do the taxpayer any favors.

The real beneficiaries of these large cleanup contracts are the contractors. From 2002 to 2012, the Department awarded its major contractors nearly \$4 billion in award and incentive fees. The contractors received these fees despite poor performance and, in some cases, received fees even before the required work had been completed.

For example, from 2009 to 2012, the Department paid Bechtel, the contractor on the Hanford Waste Treatment Plant (WTP), \$24.2 million of its \$38.6 million incentive fee based in part on Bechtel’s adherence to cost and schedule targets and its resolution of technical challenges associated with waste mixing.

In 2012, after these monies had been paid, GAO found that the project was at “serious risk” for cost overruns and schedule delays, and the Department concluded that the waste-mixing technical challenges had not been, in fact, resolved.

Unfortunately, for the taxpayer, for EM’s large contracts, cost overruns, schedule delays and technical failures are the rule, not the exception. We need to find a better way to do this because we cannot just afford the status quo anymore.

I hope we can have a constructive dialogue today with both the government witnesses and the contractors on the second panel on how to improve contract management at EM. The cleanup of nuclear sites has to happen, but the contracts to manage the cleanup can be done better and smarter.

I thank the witnesses for being here today, and I look forward to their testimony.

Senator Johnson.

**OPENING STATEMENT OF SENATOR JOHNSON**

Senator JOHNSON. Thank you, Madam Chairman.

I think it is easy in a situation like this to come into a hearing with a bias one way or the other. In a situation like this, where we have an incredibly complex problem, we are seeing these huge cost overruns, and we are seeing hundreds of billions of dollars spent by the Federal Government, there has to be some bad actor here.

You can have a bias that, of course, has to run to the contractor side, or you can have the bias that, well, boy, the government is really screwing things up again here.

As I was preparing for this hearing and reading the history of this, sometimes you have problems described as once in a lifetime, once in a generation.

The problem we are facing here with cleaning up the nuclear waste from our weapons programs is literally a once in the span of human history problem. It is not an easy issue at all.

So I am certainly approaching this hearing with a very open mind, understanding the incredible complexity and the difficulty of what we are trying to deal with here.

So, again, from my standpoint, I come to this hearing with no bias whatsoever, really looking to ask questions.

Certainly, what can we do to potentially improve the process?

What can we do to clean up these sites—because in the end that is what we are trying to do. We are trying to really take care of prior mismanagement back when the environment was not even considered, back in the 40s and 50s. Now, a generation later, we are having to grapple with this problem, and it is an incredibly difficult problem.

So, again, I am looking forward to hearing all the witnesses and really with no bias at all but a very open mind.

So thank you, witnesses, for appearing and thank you, Madam Chairman.

Senator MCCASKILL. Thank you.

We will have votes beginning at 11:30.

So what our plan is, is we will go until about 10 minutes into the first vote. So I expect that we will be here until about 11:40. Then we will pause the hearing so that Senator Johnson and I can go vote and then come back and complete the hearing as soon as we have had those three votes.

So I just wanted to give everybody that heads-up before we begin.

Let me introduce our first panel.

Gregory Friedman was named Inspector General (IG) of the U.S. Department of Energy in 1998. His Federal career has included serving as the Vice Chair of the President's Council on Integrity and Efficiency and as a member of the Advisory Council on Government Auditing Standards. Mr. Friedman has received numerous public awards, including the Department of Energy's Meritorious Service Award, the Meritorious Presidential Rank Award and the Presidential Rank Award for Distinguished Executive.

Joseph Bader was appointed as a member of the Defense Nuclear Facilities Safety Board (DNFSB) on November 29, 2004. Previously, Mr. Bader held several executive and senior management positions in the nuclear weapons and nuclear power sectors. Mr. Bader, through his work at Fluor Daniel, was also involved in the Department of Energy's Weapons Complex Reconfiguration Program. Mr. Bader has a Bachelor's degree in Mechanical Engineering from Villanova University and a Master's in Nuclear Engineering from the University of Virginia.

J.E. "Jack" Surash—am I saying that correctly, Mr. Surash?

Mr. SURASH. Yes, ma'am.

Senator MCCASKILL. Great—is currently the Deputy Assistant Secretary for Acquisition and Project Management (APM) at the U.S. Department of Energy's Office of Environmental Remediation. Mr. Surash joined the Department of Energy as a member of the Senior Executive Service (SES) in 2005 as Director of the Office of Infrastructure and Facilities Management at the National Nuclear Security Administration (NNSA). Mr. Surash also has had a distinguished 27-year Navy career and retired at the rank of Captain from the United States Navy's Civil Engineer Corps in 2003.

It is the custom of this Subcommittee to swear in all witnesses that appear before us. So, if you do not mind, I would like to ask you to stand.

Do you swear that the testimony that you will give before this Subcommittee will be the truth, the whole truth and nothing but the truth; so help you, God?

Mr. FRIEDMAN. I do.

Mr. BADER. I do.

Mr. SURASH. I do.

Senator MCCASKILL. Let the record reflect the witnesses have all answered in the affirmative.

You will be using a timing system today. We would ask that your oral testimony be no more than 5 minutes. Of course, your written testimony will be printed completely in the record.

And we will begin with you, Mr. Friedman.

**TESTIMONY OF THE HON. GREGORY H. FRIEDMAN,<sup>1</sup>  
INSPECTOR GENERAL, U.S. DEPARTMENT OF ENERGY**

Mr. FRIEDMAN. Chairman McCaskill, Ranking Member Johnson and Members of the Subcommittee, I am pleased to be here at your request to testify on the Office of Inspector General's (OIGs) perspective on contract management by the Department of Energy's Office of Environmental Management.

Frankly, my testimony, at least the opening part of the testimony, Chairman McCaskill and Ranking Member Johnson, parallels your opening statements in large part.

As you pointed out, the Department is responsible for disposing of large volumes of radioactive, hazardous and mixed waste resulting from more than 50 years of nuclear defense and energy research work. Although largely centered at sites where essential components of the U.S. nuclear weapons program existed—such as Richland, Washington; Savannah River, South Carolina; and Oak

<sup>1</sup>The prepared statement of Mr. Friedman appears in the Appendix on page 39.

Ridge, Tennessee—the effort involves 2 million acres of land located in 13 States and employs more than 30,000 individuals, the vast majority of whom are contractors.

According to the Department's own statistics, EM activities are being coordinated through more than 40 prime contracts having a total value of over \$90 billion. The current projected cost of completion is about \$270 billion, as the Chairman referred to in her opening remarks.

EM has been part of the Management Challenges List prepared by the Department of Energy's Office of Inspector General for the last decade or more. Our reviews of the Department's performance in this area have highlighted concerns in contract management, project management, cost estimating and project baseline control.

My full statement includes several examples of our recent reports which reflect these findings. Today, I would like to focus on just one of the reports concerning the cleanup of the K-25 building in Oak Ridge, Tennessee.

As a historical note, K-25, completed in 1945, contained about 2 million square feet of space. It was one of, if not the, largest buildings under one roof ever constructed in the United States to that date. K-25, using the gaseous diffusion method, was a major uranium enrichment facility—a complex but critical part of the U.S. weapons program.

In July 2011, we reported that due to contracting project management weaknesses the Department was not in a position to fully grasp the ultimate cost and time required to complete the environmental cleanup at K-25. Specifically, the Department had not recognized that the total project costs could increase to as much as \$1.2 billion, almost double the original baseline.

We found the Department had not first confirmed that the contractor reports on cost and schedule performance were accurate and reliable, conducted analysis necessary to fully understand the scope and severity of the outstanding technical issues, organized K-25 as a standalone project to give it the necessary management visibility, adjusted its approach to managing the K-25 cleanup effort despite numerous events that should have prompted such a reassessment and ensured that consistent Federal leadership to oversee the project existed throughout its entirety.

There have been a number of successful remediation efforts at select Department sites and facilities. However, significant problems with contracting project management have adversely impacted the Department's ability to achieve program goals.

The Department's EM program faces significant technological challenges. Its magnitude is unprecedented. And the maze of contracts, contract types, subcontracts and consulting agreements is extremely complex.

Yet, there are several common threads which appear to be among the root causes of the problems facing the program. Specifically, improvements are needed to ensure that:

Project scopes are realistic and manageable;

Change control management is adequate and project baselines, a primary management tool, are updated on a real-time basis;

Contract terms are kept current so they track with project events;

Contractor performance is measured against established metrics, including realistic and reliable cost estimates;

Federal staffing is sufficient in terms of size and expertise to provide effective contracting project oversight and ensure the crucial safety requirements are adhered to;

And, finally, the projects have focused, empowered and consistent Federal project manager leadership throughout their life cycle.

When problems do arise, it has certainly been our observation—and I think most would agree with this—that early detection is key. Prompt and candid reporting by contractors and timely, responsive action by Federal officials allow for thoughtful consideration of alternative courses of actions, expedited implementation of corrective measures, and maintenance of an effective baseline for evaluating contractor performance and project progress.

Recognizing the national importance of an effective and efficient EM program, the Department's efforts continue to be a prime focus of the Office of Inspector General. Notably, we are completing, as we speak, a review of alleged design quality problems at the Department's \$12.2 billion waste treatment plant at the Hanford, Washingtonsite.

Madam Chairman and Members of the Subcommittee, this concludes my statement. I will be pleased to answer any questions you may have.

Senator McCASKILL. Thank you, Mr. Friedman.

Mr. Bader, thank you for being here.

**TESTIMONY OF THE HON. JOSEPH F. BADER,<sup>1</sup> BOARD  
MEMBER, DEFENSE NUCLEAR FACILITIES SAFETY BOARD**

Mr. BADER. Thank you, Chairman McCaskill and Ranking Member Johnson.

I am Joseph Bader, Board Member of the Defense Nuclear Facilities Safety Board.

I submitted a written statement for the record that describes the Board's mission and discusses our role in safety oversight of the Department of Energy's design and construction projects, particularly the ones needed for cleanup activities. It provides a fair amount of detail on our initiative to ensure that DOE considers safety early in the design of its facilities, and it summarizes some of DOE's successes and failures in this regard.

I will provide a brief summary of my written testimony for your consideration today.

The DNFSB was established by Congress in 1988 to provide safety oversight for DOE's defense nuclear facilities. We are the only agency that provides independent safety oversight of the facilities. We are statutorily mandated to review the design of new DOE defense nuclear facilities before construction begins, to monitor construction and to make recommendations to the Secretary of Energy as needed, to ensure adequate protection of public health and safety.

The Board constantly emphasizes the concept of safety in design to DOE. Failing to consider safety early in the design of a complex

<sup>1</sup>The prepared statement of Mr. Bader appears in the Appendix on page 47.

facility will lead to surprises and costly changes later in the process.

DOE's directives and guidance for managing major projects now spell a sound strategy for integrating safety into the design for new facilities. A comprehensive approach to assessing safety risk and project risk throughout the life of the project is also central to DOE's approach to new design and construction projects.

The Board is committed to the early resolution of safety issues with DOE. To that end, we publicly document significant unresolved technical differences between the Board and DOE concerning design and construction projects in periodic reports to Congress.

Right now, the most significant design and construction projects for DOE's defense nuclear cleanup program are the waste treatment and immobilization plant at Hanford and the Salt Waste Processing Facility at the Savannah River site. Both of these projects are massive. SWPF has a project cost of about \$1.7 billion, and WTP is likely to exceed \$12.3 billion.

They are also incredibly important to DOE's cleanup mission. Millions of gallons of high-level waste liquids and solids have been stored for decades in tanks that are beyond their design life. This waste has no path to disposal or treatment unless these projects are successfully completed.

Since its conception in 2000, the WTP has been a fast-track design-build project. This approach set the project up for technology problems, and the problems were compounded by safety issues that arose when DOE and its contractors began a significant technical redesign in 2009.

That changed safety aspects of the design without sufficient basis. The redesign proceeded even though the project had not resolved key technical issues dealing with pulse jet mixing, hydrogen generation and erosion and corrosion.

In 2012, former Secretary Chu undertook a comprehensive review of the plant's design and formed expert teams to address outstanding technical issues.

DOE's path forward on this project is in a state of flux and is exacerbated by the discovery of new leaks in the tanks at Hanford.

SWPF is a simpler facility, and it avoided the major technical uncertainties that have plagued WTP. However, both projects have struggled with quality assurance, particularly in control of work by their suppliers and subcontractors. Quality assurance problems led to significant rework and delays at SWPF, in particular.

DOE's quality assurance requirements for its defense nuclear facilities are fundamentally sound, but a lack of rigor in implementing the requirements has been problematic.

Safety culture plays a critical role in the ability of designers and workers to raise and resolve technical issues and safety concerns on these major projects. The hazards posed by a failed safety culture are real and have led to costly disasters in industry.

Because of the problems on the WTP project, DOE leaders understand that they need to constantly assess and reinforce the safety culture throughout the DOE defense nuclear complex. The in-depth assessments of safety culture that DOE is undertaking across the

complex are part of a long-term effort that will be needed to improve the culture that exists today.

That ends my statement. I will be happy to answer any questions you may have.

Senator McCASKILL. Thank you very much, Mr. Bader.

Mr. Surash.

**TESTIMONY OF J.E. "JACK" SURASH,<sup>1</sup> DEPUTY ASSISTANT SECRETARY FOR ACQUISITION AND PROJECT MANAGEMENT, OFFICE OF ENVIRONMENTAL MANAGEMENT, U.S. DEPARTMENT OF ENERGY**

Mr. SURASH. Good morning, Madam Chairman and Ranking Member Johnson.

My name is Jack Surash. I am the Deputy Assistant Secretary for Acquisition and Project Management in the Department of Energy's Office of Environmental Management. I am a registered professional engineer. I have been with the Department about 7 years.

And thank you for pointing out that I served in the U.S. Navy Civil Engineer Corps for almost 28 years and achieved the rank of Captain before I retired.

In my position, I am responsible for the effective and efficient operation of the acquisition functions within Environmental Management. My office ensures compliance with acquisition statutes, regulations and DOE policies, as necessary, to achieve the Department's mission. My office also provides project management assistance, project oversight and performance evaluation by working closely with senior Department of Energy officials, external stakeholders and major contractors.

As the largest environmental cleanup program in the world, EM's mission is to complete the safe cleanup of 107 sites across the country brought about from 5 decades of nuclear weapons development and nuclear energy research. Since its creation in 1989, EM has made substantial progress. As of September 2012, we have completed cleanup at 90 of these sites, many of which supported nuclear weapons through the production of plutonium, uranium and tritium.

EM accomplishes its mission through contracts, which account for 90 percent of our budget. As such, it is critical that EM carry out an effective and efficient process for acquiring services and managing contracts.

EM transitioned from the historically large site management and operating contracts by unbundling them, and by that, I mean using smaller scope-specific contracts that use clear metrics and incentives to complete work within cost and schedule.

EM has had some notable successes at Rocky Flats in Colorado, Fernald in Ohio and, most recently, in executing over 133 projects under the American Recovery and Reinvestment Act. Cleanup at many of these sites was completed ahead of schedule and billions of dollars below initial estimates.

We have made many improvements in project and contract management, and I believe we are on the right track. Acknowledging the progress we have made in managing smaller efforts, GAO, in

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<sup>1</sup>The prepared statement of Mr. Surash appears in the Appendix on page 66.

its February 2013 High Risk List update, stated it would further narrow the focus of its high risk designation to major contracts and projects with values of at least \$750 million.

But we know we have more work to do. Based on the lessons we have learned, the Department has put in place policies and guidance to improve our contract and project management, some of which are already showing success.

First, we require proper up-front planning so that the project requirements have been clearly identified and the appropriate design maturity and technology readiness have been achieved. In particular, we require that 90 percent of the design for nuclear projects be completed prior to establishing the project baseline.

Second, we engage our internal and external oversight organizations at every critical stage of project development to ensure their expertise is incorporated early in the process.

Third, we consider the use of firm-fixed-price contracts to complete work requirements in order to cap the government's cost liability. We have also put in place objective performance measures to incentivize contractor performance and reduce costs.

And, finally, we have expanded the use of project peer reviews, following a process similar to the Department's Office of Science. We have partnered with the U.S. Army Corps of Engineers (USACE) to obtain cost estimating services as well as resources for project peer reviews.

But, please, let me be clear. We have a responsibility to taxpayers to ensure that we apply lessons learned in the future and strive to achieve our mission as efficiently and effectively as possible.

Two projects—the Waste Treatment Plant at Hanford, Washington and a Salt Waste Processing Facility at Savannah River in South Carolina—have proved especially challenging. Applying the lessons learned over the past decade, the Department would have taken a different approach on these complex, first-of-a-kind nuclear projects.

While these projects have not lived up to our expectations, these projects, in addition to our entire portfolio, have benefited from new contract and project management policies and guidance. This is part of our conscious campaign to maintain discipline throughout our processes, to improve our ability to meet cost and schedule targets.

As I have said in the past, I treat this as a journey and not a destination. We must work to continually improve our contract and project management.

Thank you for the opportunity to appear before you today, and I will be happy to answer any questions you may have.

Senator McCASKILL. Thank you very much.

Let me start with Mr. Friedman.

Mr. Friedman, the numbers of employees at the Department of Energy—15,671 Federal employees; 92,419 contractors, according to our estimate; one of the most lopsided agencies as it relates to employee-to-contractor ratios.

Some of my colleagues have advocated doing away with the Department of Energy.

What would happen to those contractors' employees if we did away with the Department of Energy as it relates to the function we are talking about today?

Mr. FRIEDMAN. Chairman McCaskill, you could do—obviously, there have been a number of proposals over the years to do away with the Department of Energy. It was created after the 1973–1974 embargo, putting—piecing together a lot of disparate parts.

The reality, as least from my perspective and our perspective as the Office of Inspector General, is that the functions that are represented by the Department of Energy's mission would have to continue. We have a moral obligation, for example, in the EM program to clean up the sites that are environmentally endangered as a result of the 50 years of nuclear work.

Senator MCCASKILL. What percentage of those contractors—the some 100,000 contractors that are employed at the Department of Energy—what percentage of those would you estimate are working on environmental cleanup and environmental management?

Mr. FRIEDMAN. My understanding—it is 30,000.

Senator MCCASKILL. Thirty thousand. So those 30,000 would have to be reassigned to another department of government, or we would just—

Mr. FRIEDMAN. No. Perhaps I misunderstood your original question.

The functions that they are carrying out—cleaning up the sites that have been talked about here today—from my point of view, certainly, we have a moral obligation to continue that, whether we do it with the same contractors, different contractors or Federalize it, if that is where we are heading.

Senator MCCASKILL. Right. OK.

Mr. FRIEDMAN. There is that possibility.

Senator MCCASKILL. OK. I know you mentioned, Mr. Surash, that there have been some contracts that have come in on top and at budget. But, historically, what percentage of the contracts would you say have come in at or near the cost estimate that was given at the beginning of the contract?

Mr. SURASH. Ma'am, off the top of my head, I do not have that number, but I will be happy to provide that.

Senator MCCASKILL. Well, can we do a ballpark?

I mean, I would assume that most of the contracts in this area have not come in at estimate based on our research we have done.

Mr. SURASH. Well—

Senator MCCASKILL. The nuclear cleanup contracts.

Mr. SURASH. If I go back, if I looked at the work—\$6 billion worth of work—done during the Recovery Act time, 2009 to 2011—

Senator MCCASKILL. I am looking at the \$150 billion of work that has been done since 1990. How much of that?

Let's take the stimulus out of it.

Mr. SURASH. OK.

Senator MCCASKILL. And, good for you, that those contracts came in at estimate and on schedule.

Let's take that \$6 billion out and do the other \$140-some billion. What percentage if you had to—and I will not hold you to this. I am just curious.

Are you comfortable in saying that certainly more than 50 percent of them have not come in on estimate, or more than 70 percent?

Mr. SURASH. I am just guessing. I will provide the number for the record, but I was going to say approximately 50 percent. It is not a number that I am happy with, and we are certainly on a path to improving that.

Senator MCCASKILL. OK. And what percentage of those that came in over estimate got performance bonuses for doing a great job? Isn't it 100?

Mr. SURASH. No, ma'am.

Senator MCCASKILL. Who has been denied a performance bonus?

Mr. SURASH. The question would be the fee for performing cost reimbursable work?

Senator MCCASKILL. Yes.

Mr. SURASH. With the contractor—

Senator MCCASKILL. I am very familiar with this concept because I found it in the Department of Defense (DOD)—

Mr. SURASH. OK.

Senator MCCASKILL [continuing]. In Iraq and when we did all our work on war contracting. We were monogramming hand towels with cost-plus contracts. We were doing all kinds of things to drive up the cost.

And the performance bonus was a rite of passage. It was not being based on how well they had performed under the contract.

This area is rife with examples of how badly these contracts have been scoped, how badly they have been estimated, and yet, it appears to me, in looking at the research we did for this hearing that there was never a question that everybody got their performance bonus, sometimes before they even performed.

Mr. SURASH. But let me, if I may, give you one very large example—the Salt Waste Processing project down in South Carolina—the work completed to date is in excess of \$1 billion. That is what we have spent on the project. The contractor has earned less than \$20 million of fees. So, on that one, on that particular contract, that particular project, I think we have—and that—to be very clear, that was fee earned during the design portion of that contract.

So, once construction started, essentially, we actually paid the contractor, I believe, about an additional \$20 million. We then clawed that back.

The contractor actually was obviously not happy with that and submitted a claim, but we denied that, and we clawed that back. So, \$1 billion of work, less than \$20 million of fees.

So, in that particular case, for this very large, complex project, I am happy with the—with what we are doing, with holding this contractor accountable.

Senator MCCASKILL. And I think that is a great example, and certainly I know that if I were sitting where you are sitting I would try to find an example that would kind of push back against the question I am asking.

But don't you think what I am saying is—if you look at the scope of work that has been done and the monies that have been paid, don't you think the assertion I am making today—when I have

looked at all these contracts, there has been contract after contract where the estimates were low, where safety was not even taken into consideration before the contract began, when there was not even a timely notification of as much as a half a billion dollars overrun in cost until 18 months after it was due.

I can go through contract after contract after contract, billions and billions and billions of dollars, and in every single one of those contracts, they got their performance bonus.

Mr. SURASH. If I may, ma'am, I would point out a couple of items. First, a number of years ago, we moved away from qualitative award fee. So almost all of our fee is quantitative. So we pay a fee for preestablished milestones.

Now I know that the IG did find a case out at the Waste Treatment Plant. I believe it dates back to 2003. It was several million dollars where the fee was paid, and the work was not done correctly. That was a mistake, and we have since put in a very rigorous process across the board, including the Waste Treatment Plant, to keep that from happening.

But if I may give a second example, this is the K-25 project that Mr. Friedman's office reviewed. And we agree; we definitely had problems. There were problems on the contractor side with performing at Oak Ridge on that very complex nuclear demolition and decontamination of a gaseous diffusion plant.

It is huge. A couple of golf courses would fit within this building—the largest plant, the largest building built in the 1940s or 50s when it was constructed.

We also had some problems on the Federal side. I actually remember this fairly well. This is one of the first major issues that I uncovered after arriving at the Office of Environmental Management.

So what we did is that contract had been restructured once already. We restructured the contract again from a cost-plus-award-fee to a cost-plus-fixed-fee—relatively low fixed fee—and we did that because we were just having management problems in managing the work there.

And, if I may go one step further, to talk about that particular contract, if I may—this is the K-25—this is the contractor that had the K-25 project.

In about 2009, when we did this contract restructuring, the intent here was to put in place a cost reimbursable contract with a relatively straightforward fee design.

About 6 or 7 months after we did this, I can remember a meeting where the contractor came in and told our assistant secretary that they were going to have an additional overrun of several hundred million dollars. This was in about 2009.

We were not happy about this.

So the action we took is we accelerated the procurement action that we had ongoing. We ended this contract when they hit the target cost. This contract included this K-25 facility plus a lot of other work.

And so within about a 9-month timeframe after the competitive proposals—were received, we awarded a new contract.

And I would say of our large contracts, this is about a \$2.1 billion project and includes K-25, a couple other facilities down there.

This is actually one of the best performing. We did a great job pre-award, getting a new contractor in there, and this is about the best performing large contractor. If you were to ask me, this is the example I would have provided you.

The contractor is doing a bang-up job there. The Federal staff at Oak Ridge—I think they took to heart the IGs recommendations made several years ago, and they are managing and administering this contract in a tremendous fashion.

This K-25 project is now going to come in several hundred million dollars lower than what it was rebaselined at. So it is still over cost from what we originally thought, but I think I am happy with what we were able to do when this happened.

Senator MCCASKILL. OK.

Senator JOHNSON.

Senator JOHNSON. Thank you, Madam Chairman.

First of all, Mr. Surash, thanks for your military service.

And I would like to ask all the witnesses; do you think the Federal Government has any capability of doing this themselves—in other words, not using contractors? Can we hire the people?

And, Mr. Friedman, I will start with you.

Mr. FRIEDMAN. Senator JOHNSON, my view is that all options ought to be on the table.

I am not sure I can sit here today and say the Federal Government could do it without the contractor assistance. I am not sure that is the case.

There is a lot of very specialized expertise that is necessary—technicians with unique skills. And I am not sure that we have them, and I am not sure that it would be easy for us to get them at the pay scale that we can pay for most Federal employees.

But I would not rule out any option to try and cure this problem. So I think the possibility of Federalization ought to be considered. We have not studied it, per se, but it is certainly an option that ought to be thought through.

Senator JOHNSON. But, if we were to totally Federalize it, we would have to hire tens of thousands of employees. Is that correct?

Mr. FRIEDMAN. That is absolutely correct.

Senator JOHNSON. Twenty thousand plus?

Mr. FRIEDMAN. That is absolutely correct, and people with experience in these very unique skill sets that would be necessary to do this sort of work.

Senator JOHNSON. So, from what you have seen as an Inspector General in the Federal Government, do you think the Federal Government—what is the likelihood that we would be able to hire those 20,000 very specialized employees and be able to pull this thing off?

Mr. FRIEDMAN. Well, I started my career as a careerist, Senator JOHNSON. So I have confidence that you could do it if you set your mind to do it, but I do not have a high confidence level.

Senator JOHNSON. OK.

Mr. Bader, do you believe the Federal Government has the capability of hiring these specialized individuals and doing this themselves?

Mr. BADER. I would think it would be difficult but not impossible.

Senator JOHNSON. Sir?

Mr. SURASH. Sir, this is not something that I have actually, frankly, thought about before. I think it would be very challenging.

I mean, some of the great successes that we have seen, like out at Rocky Flats—we had almost a \$4 billion project brought in at a half a billion dollars and years ahead of time.

I am not confident that a Federal workforce could do that. I think a properly managed and incentivized contract work force—

Senator JOHNSON. Let's talk about the available contractor base. My guess is you are using the Federal employees to basically manage the general contractor who then potentially manages some sub-contractors, correct?

How many general contractors in the world exist that could actually handle this really once-in-a-span-of-human-history problem that we are trying to solve here?

Mr. SURASH. Sir, this is very complex, specialized work. The nuclear safety background and requirements are a heavy lift. So I would say about a couple of handfuls at most today.

This seems to be—

Senator JOHNSON. So you have maybe got about 10 general contractors?

Mr. SURASH. Yes, sir, prime. Contractors that can function as a prime contractor to do this work, yes, sir.

Senator JOHNSON. Do you feel it is essential to have those prime general contractors to also supervise the subcontractors, or do you think the Federal Government could hire enough people to act as the general to work with the subcontractors?

Mr. SURASH. A lot of the work is actually performed by the prime contractors.

Senator JOHNSON. OK.

Mr. SURASH. We have about 30,000 incumbent workers at our site that are highly trained and typically will remain there if it is a follow-on contract with the next contractor. And probably half of the work is done in that manner, and maybe the other half is sub-contracted out.

It is something I would be happy to look at. I think it is a great concept. It would be—

Senator JOHNSON. Well, I am not suggesting. I am just asking about the possibility.

Mr. Friedman, if we spent \$100 billion, or 150—whatever the figure is we have spent to date—has anybody done an analysis in terms of what the contractor base has made in profits over that time period?

Mr. Surash was talking about \$20 million made on a billion dollars worth of a contract, which is not from a business guy's standpoint, I do not know why they do it.

But do you have any feel for what has been contracted in the past, what the profit levels are for the contractors?

Mr. FRIEDMAN. I do not know, but remember, Senator Johnson, you have to look at the investment and the capital that the contractors have put forward before you make that analysis. Twenty million on a relatively small investment may not be a bad return although I do not think it is a good return. But the returns have been considerable over time.

Senator JOHNSON. Name considerable.

I mean, are you talking percent? Are these guys making 50 percent of sales?

Mr. FRIEDMAN. No.

Senator JOHNSON. And, by the way, percent of return really is based on sales because you are putting in all kinds of time and effort. It is not just simply you are investing in equipment in terms of how you evaluate your return.

Mr. FRIEDMAN. Well, there are multiple ways. I do not want to debate with you about them—

Senator JOHNSON. Sure.

Mr. FRIEDMAN [continuing]. Because you are a business man, I know, but there are multiple ways of evaluating the efficacy of a particular project from a business point of view. Certainly, you have identified one.

I do not have a number as to how profitable they have been over time, but I will tell you that the cadre of contractors that keep coming back for more work are not coming back because they are losing money. So it is pretty obvious that they find it reasonably attractive.

Senator JOHNSON. OK. I guess that was the question I was going to ask you.

Mr. SURASH, are you concerned about losing contractors?

Mr. SURASH. Sir, I do not believe so.

We are working to try to increase the contractor base. I mean, going from 12 prime contracts in the late 90s to almost 40 contracts today has resulted in some expansion of that base.

We also have a strong focus on trying to set aside work for small businesses, and we are executing about \$300 million a year on some very complex work with small businesses, and—knock on wood—they are doing very well on the work that they have.

Senator JOHNSON. Just one more quick one?

Senator McCASKILL. Sure.

Senator JOHNSON. You had mentioned in your testimony that at I believe it was the Savannah River site that you would have taken a different approach. Can you just briefly describe what approach was taken and how you would have done it differently?

Mr. SURASH. Absolutely. And I think Mr. Friedman and Mr. Bader have also commented on that.

One of the problems, and a lesson learned the very hard way, is that we have a lot of very dangerous waste out there left over from the Manhattan site, Manhattan Project days and legacy of the nuclear weapons program. So, on one hand, we want to get on with the work; on the other hand, there is doing it the right way in a step-by-step fashion.

And so a lesson learned is that we have not matured technologies; we have not let design get sufficiently mature; we have not worked on the nuclear safety aspects of our projects before trying to start to begin construction of them, and we are not going to do that again.

We have learned that lesson, and that is why in my statement and in the actions we are taking now, we want to do a better job with up-front planning. We want to mature the technologies that are going to be used. We want to work very closely with the Defense Nuclear Facilities Safety Board and the other regulators.

We want to advance the design because what happened on both the Salt Waste Processing project and out at the Waste Treatment Plant is actually construction was underway and we found that we had to change the design. At the Waste Treatment Plant, we have technology problems.

So we would have gone in a step-by-step fashion if we had to do it over again. Mature the technologies. Get the design done. Then build.

Senator JOHNSON. Two problems that really exist are just a one-time design as well and some of these tanks are already leaking, and there is some imperative to get going on these things. Is that also correct?

Mr. SURASH. You are absolutely correct, and that is the push-pull that we have. We want to get on with the work, but there is a proper way, if time was not taken into account, that we would want to proceed.

Senator JOHNSON. OK. Thank you, Madam Chairman.

Senator MCCASKILL. Thank you.

Senator Begich, welcome.

Senator MCCASKILL. We are glad you are here.

#### **OPENING STATEMENT OF SENATOR BEGICH**

Senator BEGICH. Thank you very much, Madam Chairman, for this Committee hearing.

Mr. Surash, let me ask you the question; you had said on the stimulus money you received—those were all on—I am not sure I heard you properly, but they came in as you anticipated, price-wise.

Mr. SURASH. Ninety percent of all the work on just about six billion dollars worth of work were essentially on-cost.

Senator BEGICH. And were those some of the contractors that we also have issues with on the other end?

Mr. SURASH. On many of them, not exactly, but I would say the majority of them, yes, sir.

Senator BEGICH. OK.

Mr. SURASH. But I would also, if I may, say that with the Recovery Act, we needed work that was ready to go, and we actually implemented some of our lessons learned and new processes and procedures during the Recovery Act.

Senator BEGICH. I guess I am leading to the question here that the Recovery Act money, which was probably the most recent kind of block that was significant—that had different procedures than some of the past?

And let me ask you—it is a two-parter here—because we have a bad habit here in Congress of not telling agencies what their full amounts will be because we do continuing resolutions and we do lots of stuff here that really, to be frank with you, screw up the process.

And so was getting the stimulus money in a known quantity helpful in getting those bids?

Mr. SURASH. Thank you, sir.

On your first question, we implemented some of the improvements from lessons learned during Recovery Act, and we saw good results from that.

But another very important thing which you bring up is the ability to have budget predictability.

Frankly, in the past, on some of our large projects, we approved what is called a project baseline, which is our commitment to the Congress that we are going to deliver a certain project at a certain cost on a certain date without being able to properly carve out in our budget for the next 5, 10 or 15 years, that money and have it absolutely reserved. So that has been an issue.

Recovery Act—we, essentially, got the money—

Senator BEGICH. You knew what you were getting.

Mr. SURASH [continuing]. More or less up front and—yes, sir.

Senator BEGICH. Let me hold you there.

Mr. Friedman, you just heard this conversation here. Do you agree with that or disagree with that?

Mr. FRIEDMAN. I do not know which aspect, Senator Begich.

Senator BEGICH. Whichever one you want to respond to.

Mr. FRIEDMAN. Whichever one.

Senator BEGICH. Because then I will do the others that you do not.

Mr. FRIEDMAN. As Mr. Surash alluded to, I think the Department—the EM program received \$6 billion under the Recovery Act, if I remember correctly. Its annual budget is \$5.5 billion, which gives you some perspective.

But what is interesting is that, as he alluded to, the Department as a strategy, chose projects that were sort of the low-hanging fruit, comparatively easy projects, less challenging projects.

So that while—

Senator BEGICH. So the risk was less.

Mr. FRIEDMAN. The risk was less.

And we issued a number of reports on the EM's expenditures under the Recovery Act. There were a number of positive attributes, and we reported those. There were some problems.

But I think in part it was a function of the fact that these were by their own strategy, which I think we understand in terms of getting the money into the economy quickly—they were comparatively shovel-ready projects.

Senator BEGICH. Understood.

Let me ask, Mr. Surash, when these projects are scoped, how much of the Agency is part of that process at the front end?

In other words, let me lead you to the next question so you know where I am going, and that is I know where Mr. Johnson was going. I agree; I would not want to see 20,000 Federal workers—I just did the math on how long it would take us to recruit them because our recruitment system is so efficient here in the Federal Government. It might be 10 years from now before we get the first 200. But how we use, the contrary is, the people we have working for us.

I guess the question is I know when I was mayor, and we would scope projects. And there was a constant situation where we had someone who was scoping the project, and the bids came in much higher than the estimates. That person did not work for us after a little period of time.

So how is internally your operation doing this?

Mr. SURASH. Yes, sir, let me try to give you a sense of that. I will talk about—

Senator BEGICH. Let me pause you because I know one other issue Senator McCaskill and I had when I was on Armed Services was the F-35, which had questions of its scoping capacity. And it almost doubled, I think, per unit price, if I remember right.

And they had to make some changes over there from the top-down, if I remember right—general-down. But that had never been done before.

So I am curious; how is it working?

Mr. SURASH. So let me try to answer it this way, if I may. I will talk about contracting authority and approval of a project.

So, on the contracting side, our sites—and there are approximately 6 large sites—

Senator BEGICH. Correct.

Mr. SURASH [continuing]. Have \$25 million of change authority.

So any contract action, whether it is a new contract or a change, up to \$25 million, they can deal with. That is a lot.

Senator BEGICH. Cumulative or individual change?

Mr. SURASH. Each item. That is a lot of—

Senator BEGICH. Cumulative, it could be who knows what.

Mr. SURASH. Item by item.

Senator BEGICH. OK. That is still a lot of money.

Mr. SURASH. Twenty-five million is a lot of money.

Now, in the context of \$5.5 billion, it is a relatively small amount.

Senator BEGICH. Right, but if it is cumulative and so you start adding up items.

Mr. SURASH. Absolutely. My authority is \$50 million.

Senator BEGICH. Mm-hmm.

Mr. SURASH. Above me, it goes into a Department of Energy Office of Acquisition and Procurement Management.

So, at that point, definitely, the rest of the Department and our General Counsel, et cetera, have this ability.

Senator BEGICH. But how is the project originally scoped—because I saw when you mentioned the K-25 it was \$100 million below the rebaseline.

Mr. SURASH. Right.

Senator BEGICH. I am just curious; from the original to the rebaseline, how much difference in cost increase was that?

Mr. SURASH. If I—

Senator BEGICH. Because you are basically saving off of an increase.

Mr. SURASH. That is true, and that is why I wanted to be fair when I said that.

Senator BEGICH. How much is that increase?

Mr. SURASH. If I may, sir, can I tell you about the project approval and then answer that, if that would be OK?

Our sites for a project, to approve the baseline—the baseline is what we are committing to the Congress that we are going to deliver on.

Our site managers have \$100 million of authority. My Assistant Secretary has \$400 million. Anything above \$400 million is above him. We have an Undersecretary. We have a Deputy Secretary.

And so they have——

Senator BEGICH. OK.

Mr. SURASH. They are involved in that.

If I may, I will give you very rough numbers, but I can, for the record, give you the exact numbers.

Senator BEGICH. That would be great.

Mr. SURASH. For that K-25 project, I believe it was about \$500 million original baseline cost, circa 2008.

Senator BEGICH. Mm-hmm.

Mr. SURASH. And the rebaseline was approximately \$1.3 billion.

So I mean, again, to be fair, I said that we are three or four.

Senator BEGICH. Let me pause you there.

Mr. SURASH. Yes, sir.

Senator BEGICH. Who did the original baseline?

That is what I am trying to get to because here is my question; we do not have a good habit in the Federal Government.

I mean, I will not get on my Congressional Budget Office (CBO) rant, but they are always off 20 percent, which—I do not know—is a couple hundred billion a year on the deficit.

But, it seems around here \$200 billion seems to be small change according to some people, not to me, who does the original scoping to develop the baseline? Is that internal?

Mr. SURASH. The way this would work is it starts with the contractor. That is who is doing the work.

So the contractor——

Senator BEGICH. With your oversight?

I mean, someone must look at these numbers——

Mr. SURASH. Sure.

Senator BEGICH [continuing]. Within your organization and say these look good.

Mr. SURASH. It is, essentially, maybe three steps.

So, step one, a contractor number comes through competition or through negotiation. So you have a number of, let's say, \$400 million.

Senator BEGICH. OK.

Mr. SURASH. And in the case I am giving you, it is the Deputy Secretary that is approving this project, or not.

So, on top of the contractor's number, there would be a risk analysis done for the sorts of risks that the Department of Energy sees in the contractor's ability to perform this. And there are certain work elements that the contractor would not be responsible for.

So, in this case, let's say that there is \$100 million of Department of Energy risk.

So what would be presented to the person called the Acquisition Executive, who in the example I am making up here is our Deputy Secretary, is: Here is the scope of the project. Here is when we are going to complete it. The price is \$500 million.

And lots of different components in the Department are aware of this. There are external reviews done. We have a separate office that, in this case, would go out and do an external, independent cost estimate to make sure that we have this project in our sight.

So let me just, if I can, say as an example of our improvements—I mean, I do not like the numbers here.

But in 2008 we were kind of under the old system. In 2010, we were on the way to improving so we set a new baseline which is what we thought it was going to take to do the job. And all I can say now is partially through providing the right number up front and, No. 2, the contractor performing, we are going to come in below this higher amount.

Senator BEGICH. OK. Thank you.

I apologize, Madam Chairman. I went longer than I should there.

But I am just trying to figure out—and I get now you have a new system, but how that baseline is developed is really the core. And if you are developing it and you are off—again, your old model—60 percent on the K-25, really what I am trying to figure out is how that happens. I think I got a sense.

But also, I want to make sure—and we are part of the problem too because you are being asked to give us a number. We tell you it is too high because the budgets are so much. Then you have to fit it in.

Is your system now to the point where you will be able to say, here is the amount; it is going to cost a hell of a lot of money, but that is what it is going to cost?

Despite the pressures that may come from Congress and/or the Office of Management and Budget (OMB), which is a great sanitizer, are you going to be able to do that in the future—because I just know the numbers are huge when you are off.

So I will end on there. Maybe it is a rhetorical question. I do not know.

Mr. SURASH. I can try to give an answer, if that is OK.

Senator MCCASKILL. Sure.

Mr. SURASH. And, again, this is from the acquisition and project management standpoint. There is a lot of other folks above me, including our Chief Financial Officer (CFO) and the Secretary, et cetera.

I would just like to say that there are tremendous regulatory pressures. We have consent orders that if we do not get certain work done that we will be fined. So this is on the budget side, this is very difficult.

And I would like to have, quite frankly, a better ability to project how much we are getting in the out years—not just, for instance, now what we are going to get appropriated in fiscal year (FY) 2014 but from the project management and acquisition side, 5, 6, 10 years out so that we can plan, so that today we can say, oh, that project fits our profile or it does not. And, if it does not, we really should not be trying to start it because that is part of how in the past we got in trouble.

Senator MCCASKILL. Do not hold your breath on getting budget commitments 10 years down the line. We have a hard time getting budget commitments 10 minutes from now, much less 10 years down the line.

I understand the Department of Energy has some serious vacancies in its leadership and that, in fact, where you work, Mr. Surash, you have been without a confirmed Assistant Secretary since 2011. Is that correct?

Mr. SURASH. That is correct, ma'am.

Senator MCCASKILL. Let me also ask about chasing technology.

I want to talk about Hanford. The cost of this project has gone from \$4.3 billion to \$13.4 billion. That is how it has changed in terms of what the estimates were, and there is no guarantee that it is not going to cost even more than that. One of the problems has been the technology is not working.

It concerns me in some of the information I read for this hearing that not only are we chasing technology; we have actually gone to a large-scale effort at technology when there has not even been a small-scale testing of the technology. And so we have spent—instead of spending \$10 million or \$20 million, we have spent multiples of that to learn that the technology simply does not work.

How are you dealing with this issue?

Mr. SURASH. OK. So I just would like to first say that we are dealing with very complex, first-of-a-kind plants. Nobody has ever built these before. Nobody has ever put the components together.

So what we want to do better—what you stated is true, ma'am. Unfortunately, it is true.

So, again, another lesson learned that I talked about before has to do with up-front planning.

So what we need to do here is let the technology mature and work out the bugs, work with the regulators, work with the Defense Nuclear Facilities Safety Board, make sure that we are meeting or addressing the requirements, make sure that our budget—and what I was talking about before is really planning authority—is in line and can support the project, and then let the design mature.

So, if I may give an example of where this has worked relatively well—the Salt Waste Processing project. Yes, we have a large cost overrun going on there, but what we did there is we actually have a pilot-scale plant that has been in operation for several years that is using the exact technology that this much larger, billion-dollar-plus plant is going to use.

So that is an example of the sorts of things that we should do.

Senator MCCASKILL. OK. So you understand this is a problem, and you understand this is an issue, and you understand the investment in small-scale will pay for itself multi-times over rather than abandoning something that you go to large scale without the proper small-scale test.

Mr. SURASH. Absolutely, and this is part of this tug on getting on with work versus doing it right.

A pilot plant will actually cost a little bit more money up front. It will take more time. But we have learned the hard way for the first-of-a-kind nuclear, very complicated projects that we really need to do this or else we are asking for trouble and we are rolling the dice down the road.

Senator MCCASKILL. Do you believe, Mr. Friedman, that they are doing better on this front?

Mr. FRIEDMAN. I think, frankly, there have been a number of actions which I think are admirable and which we certainly agree with in seeing from our history, but I think the jury is out. We are going to have to wait and see. At this point, I cannot give you confirmation of that.

Senator MCCASKILL. The number of prime contractors—I want to make sure I understood your testimony correctly. We are not seeing a shrinkage; we are actually seeing an increase?

Mr. SURASH. We have seen a little bit of an increase, and I would say mainly on the smaller contractors. Off the top of my head, I cannot think of a very large new firm that has entered the picture.

If I am mistaken, I will provide—

Senator MCCASKILL. And what about subs?

Mr. SURASH. Ma'am, our privative contract, as you are aware, is with the prime contractors. There seems to be—I am not aware of issues with lack of subcontractors or lack of competition. So that seems to be going OK.

In some cases, for instance, the Oak Ridge project I was talking about before, the way we structured that is we wanted 60 percent of the work to be done by subcontractors, and that seems to be working out relatively well.

Senator MCCASKILL. You know what is interesting to me is, having spent so much time in the defense space, you have a wealth of competitors compared to some space at DOD. A wealth of competitors.

But it appears to me that in many instances you have not been as robust as DOD in seeking new contracts, new bids, rather than just extending existing contracts.

Would you say, is that an accurate statement, Mr. Friedman, from your perspective?

Mr. FRIEDMAN. I do not have a specific report to support that, Senator McCaskill, but I do believe that is the case. I think they could be more aggressive in seeking out alternatives.

Senator MCCASKILL. If you had to—and my time is coming to a close, and I want to make sure that we get a second round with my colleagues if possible before we go vote.

But if you could crystallize where you think the most challenges remain—we are not even halfway yet. I do not think Americans have any idea the amount of money that has gone out the door with relatively little oversight.

I mean, has there been a hearing like this that you are aware of, ever?

Mr. SURASH. Not focusing on contract management, ma'am.

Senator MCCASKILL. Yes. I mean, we have been doing this for 23 years and spent \$150 billion, and there has been very little overlooking the shoulder on this. And that never is good for the taxpayers.

So, could you crystallize, Mr. Friedman, the two or three biggest challenges that have not yet fully been embraced by this area of contracting in our government?

Mr. FRIEDMAN. Well, let me break it into two buckets if I can.

One is the Federal side. We need the right people with the right expertise who feel empowered to handle the government's perspective on contract oversight. That has been lacking in the past.

The right numbers are important, but people with the right skill sets at the right place at the right time and, again, empowered.

And, second, to get back to a point which I think all of you have raised, is the question of baselining and a change control system. This is the second bucket, if you will. The contractors' side is mak-

ing sure that we have the quality estimates that are validated by the government, by Federal folks, and that becomes the line—against which we evaluate contractor performance going forward and project performance going forward.

Senator McCASKILL. Thank you very much.

Mr. Johnson.

Senator JOHNSON. Thank you, Madam Chairman.

Mr. Surash, I was kind of gleaning from your testimony that one of the directions you are moving to in terms of contracting is breaking these contracts down into more manageable, bite-sized pieces. Is that correct?

Mr. SURASH. Absolutely. If you went back to the late 1990s, you would have seen approximately 12 very large, very general scoped contracts that were management and operating type of contracts.

A very different sort of contracting mechanism today—we have approximately 40 contracts, and all but 2 of these are what I would call traditional cost-plus types, a couple small fixed-price type of contracts.

So, absolutely, we have done that.

Senator JOHNSON. OK. To me, that makes sense.

In the Hanford site, it is also my understanding that \$4.3 billion original cost estimate—that was for a phase I, and it was always contemplated there is going to be a phase II. And now, when we are talking about the \$12.3 billion or \$13 billion, that includes both phase I and phase II. Is that correct?

Mr. SURASH. Absolutely.

Senator JOHNSON. And, by the way, has that been broken down to smaller bite-sized pieces as well?

Mr. SURASH. If I may first mention that the \$4.2 billion number that keeps getting mentioned—that was for a contract awarded in 2000. And what I want to point out there is that was for a plant that would operate for 40 years and treat about 40 percent, by volume, of the radioactive waste out there.

The plant today will treat 100 percent of the high-level waste, 40 percent of the low-level waste and operate for 50 years. So that is partially the reason for this cost growth. We actually are increasing the scope of what can be provided.

To answer your question on the waste treatment plant, that is currently a single contract still today. It was originally awarded in 2000.

Senator JOHNSON. OK. It is Hanford where we are actually getting leakage right now, too, isn't it?

Mr. SURASH. That is correct. Actually, there is a separate contractor that is managing the underground tanks where we have some suspected leaking tanks.

Senator JOHNSON. That is definitely heightening the concern in trying to speed this process up to address that fact.

Mr. SURASH. Yes, sir, absolutely.

Senator JOHNSON. Let's go to the Safety Board a little bit in terms of its impact on cost and scope and those types of things.

Mr. Bader, in the Safety Board's recommendations, is there any cost-benefit analysis done to your recommendations?

Mr. BADER. There is not.

Senator JOHNSON. What guides your recommendations then? Strictly, public safety?

Mr. BADER. First of all, we look at the public safety and try and be sure that there is adequate protection. In doing that, we consider the technical and economic feasibility but do not do a cost-benefit analysis.

Senator JOHNSON. Mr. Surash, has any recommendation from the Safety Board ever been turned down or pushed back, or let's say first, turned down?

Mr. SURASH. Sir, that is a little bit out of my area of expertise, but I can provide that for the record. There may have been.

Mr. Bader may—

Senator JOHNSON. Mr. Friedman, are you aware of any recommendations from the Safety Board being turned down?

Mr. FRIEDMAN. I do not know specifically, Senator.

Senator JOHNSON. So—

Mr. FRIEDMAN. I do not know one way or the other.

Senator JOHNSON. OK. It would be my concern if you have a Safety Board—again, I think we are all concerned about safety—but if they are operating outside any kind of cost-benefit analysis, one of my concerns—I know in Idaho one project was the Idaho National Laboratory.

I know a Safety Board recommendation was to take into account a seismic event, and so that project was stopped dead for at least a year and a half to basically redesign a plant that was scheduled, I think, to operate for 18 months.

Now I believe those were tanks that were there, that have been sitting there for decades, also certainly at risk in terms of seismic events, but now we are going to clean it up, hopefully, in the span of about 18 months.

And then the Safety Board recommends, no, we have to include all this rebar, all these construction codes, construction techniques, to really prevent damage in a seismic event.

Is that part of the problem there?

Mr. SURASH. Sir, if I can answer, that actually happened at the integrated waste treatment plant in Idaho that you were mentioning. We came across that on the Salt Waste Processing project and also the waste treatment plant.

The root of all this has to do with this proper up-front planning. We really need to mature the design, work with regulators and oversight organizations before we start building. But we did not, and what happened is accurate.

Senator JOHNSON. Do you know what the cost of that was in terms of reinforcing that building for seismic events?

Mr. SURASH. I will provide a very accurate number for the record, sir. It was—

Senator JOHNSON. Ballpark?

Mr. SURASH. Just a wild guess, maybe \$20 million or \$30 million.

Senator JOHNSON. OK. Well, unfortunately, in the scheme of things, that is not that big a number in terms of what we are spending.

Mr. Bader, do you want to comment on that?

Mr. BADER. We did not make a recommendation. We had a letter, which we would call a project letter, which was issued. And, actu-

ally, if you would like us to submit it for the record, I have a copy here.

And we were actually largely in agreement with the project through DOE on the seismic requirements.

Senator JOHNSON. OK. I guess maybe I should ask you this question; are there any safety recommendations that you made that DOE has either pushed back on or simply declined to enact?

Mr. BADER. There was one recommendation which was partially rejected by the Secretary but which he said he would actually respond in his implementation plan in a manner that would meet our concerns.

Senator JOHNSON. Out of how many recommendations have you put forward since your establishment—a ballpark?

Mr. BADER. I will have to get back to you, but it is 40 or 50 over the years.

Senator JOHNSON. OK. That is all I really have, Madam Chairman. Thank you.

Senator MCCASKILL. I want to thank all of you for being here.

I thank all of you for the efforts you are making to tackle a problem that—I agree with you, Mr. Friedman. We have a moral obligation to clean this stuff up, but this, I do not think, is ever going to be anybody's poster child for the most efficient and effective use of taxpayer money in terms of how we have gone about this challenge. But all of you, I know, are serving the public, and we appreciate it very much.

And we will take a recess now to have three votes. I believe we are at the end of the first vote. So, by my clock, we should be able to reconvene in approximately 30 minutes with the second panel. Thank you very much. [Recess.]

I will get started. I know that my Ranking Member is right behind me because we walked over together. He just got waylaid in the hall for a minute.

And we have to be out of here by 1. I know you all are heartbroken at that—that we cannot go on for hours, but—— [Pause.]

If you all would do the best you can in terms of the length of your oral testimony today.

I am sure that I speak for my colleague in that we have obviously had an opportunity to review a lot of the information that you have provided us already, but we do not want to minimize your opportunity to speak today. Since we are under a time constraint of about 30 minutes, we want to make sure we at least have an opportunity to ask some questions.

Michael Graham is the Principal Vice President at Bechtel National, Inc. and is a Manager of Bechtel's U.S. Environmental Operations. Previously, Mr. Graham was the Associate Director of Environmental Programs at Los Alamos National Laboratory in New Mexico. He has held key management positions at the Idaho National Laboratory, the Hanford site and the Pacific Northwest National Laboratories.

Michael McKelvy is President of CH2M HILL's Government, Environment and Infrastructure Division. Mr. McKelvy has served as President and Group Chief Executive for the Industrial Client Group and President for the Manufacturing and Life Sciences Business Group. Mr. McKelvy also serves as the Chairman of the Board

for CH2M HILL's Environmental Remediation joint venture companies at the Hanford and Idaho sites. Previously, Mr. McKelvy worked as a project manager and project architect in Oklahoma.

Frank Sheppard is Vice President and Deputy Project Manager of Parsons Governmental Services. Mr. Sheppard also serves as the Deputy Project Manager of the Salt Waste Processing Facility at Savannah River, where he is responsible for project costs and scheduled performance. Previously, Mr. Sheppard served as a Salt Waste Processing Facility contracts manager and business manager. Prior to his work at Parsons, Mr. Sheppard worked at the Departments of Defense and Energy, the Nuclear Regulatory Commission (NRC) and the United Nations.

If you all would stand in order to take the oath that is customary in this Committee—do you swear that the testimony you will give before this Subcommittee is the truth, the whole truth and nothing but the truth; so help you, God?

Mr. GRAHAM. I do.

Mr. MCKELVY. I do.

Mr. SHEPPARD. I do.

Senator MCCASKILL. Thank you very much.

We will begin with you, Mr. Graham.

**TESTIMONY OF MICHAEL GRAHAM,<sup>1</sup> PRINCIPAL VICE  
PRESIDENT, BECHTEL NATIONAL, INC.**

Mr. GRAHAM. Madam Chairman, Senator Johnson, Members of the Subcommittee, I am Michael Graham, Principal Vice President at Bechtel National—a contractor to the DOE for environmental management work and the lead contractor for the Hanford Waste Treatment and Immobilization Plant.

Bechtel is a global engineering and construction company with more than 115 years in the business. Our company has a long history of working in the private sector, but we have also worked on some very large government projects, including the Hoover Dam, building Liberty Ships during World War II and now the Washington Metro Silver Line in our back yard.

We have successfully designed, managed and constructed hundreds of large-scale projects around the world, including putting out the oil fires in Kuwait, constructing major motorways and high-speed rail lines in Asia and Europe, including the Chunnel, and designing and building nuclear power plants in the United States. Some of our largest endeavors have been design-build projects.

Bechtel National began operations in 1977, and among its first contracts were response efforts at Three Mile Island in 1979.

To be sure, DOE projects are often complex and challenging. They are often one-of-a-kind endeavors, but they also present an opportunity to solve some of our country's greatest problems, many that owe their legacy to the Manhattan Project.

We are proud of our accomplishments for DOE. I have personally worked at four of the major DOE sites—Hanford, Idaho, Savannah River and Los Alamos. For example, I led the Hanford Groundwater-Vadose Zone Integration Project to evaluate the impacts of

<sup>1</sup>The prepared statement of Mr. Graham appears in the Appendix on page 73.

Hanford waste on the groundwater in the Columbia River, and that included tank waste.

To date, DOE's Environmental Management program reports that it has completed cleanup of 90 of their 107 waste sites—a testament to strong industry support that works together, in partnership with DOE, to solve challenging problems.

Yes, we have successfully completed tough jobs, but the very toughest ones are now upon us.

The largest and most complex DOE project is the waste treatment plant in Washington State. This one-of-a-kind project includes a complex of facilities being designed and built to immobilize a highly radioactive waste in 177 aging underground tanks. Some of these tanks date back to World War II. Sixty-seven are reported to have leaked.

In December 2000, when we entered into the contract to design and build the Hanford Waste Treatment Plant, we knew this job, which is the size of at least 2 commercial nuclear power plants, would be a challenge. Working closely with DOE, we have managed the challenges of new technologies, uncertain waste streams from the tanks, evolving requirements and the need to sustain a complex supply chain during periods of funding uncertainties.

The waste treatment project today is a very different project than when we signed up for it in 2000. Back then, DOE described it as a pilot project and one that was much smaller in scale and capability. DOE directed it be a fast-track design-build effort to address the real risk of high-level waste leaking into the groundwater from those aging tanks. Glass was scheduled to be produced by 2007, with 10 percent of the waste being treated by 2018. A multi-billion-dollar phase II facility would be built later.

Since then, the plant capacity has been significantly increased to enable DOE to eliminate that second phase. Pretreatment capacity was increased by 40 percent, and the high-level waste facility glass production was increased by a factor of 4. These and other increases in scope were substantial factors addressed in the revised project baseline in 2006.

We are very proud of Bechtel's performance on this design-build contract overall, but like any project, we have learned many lessons along the way.

Our conservative design-build approach approved by DOE has significant built-in margin. For example, implementing the revised seismic criteria in 2006 did not require any major construction rework.

Nevertheless, Bechtel, with DOE, has taken several steps to improve the design-build concept and execution. After the project was rebaselined in 2006, we deployed an earned value management system to track and manage our progress. This system has been certified and revalidated by DOE as recently as 2012. Utilizing this system, the WTP project performed to that baseline until 2011, when DOE requested that decisions regarding the waste treatment processing requirements be revisited.

Last year, Secretary Chu put some parts of the project on pause while he assembled a team to take another look at a number of critical technical decisions. Many of these decisions are related to what would happen if WTP receives waste outside of its waste ac-

ceptance criteria. Resolution of those decisions to everyone's satisfaction could have impacts on cost and schedule.

We are confident we can complete the job and put WTP into operation as we work our way through these decisions. We, and other contractors involved in this critical national mission, remain fully committed to complete the project.

WTP is currently designed to safely treat most of the tank waste. We simply must get on with it. As you know, the situation with the tanks continues to deteriorate. That is the real risk.

Thank you for the opportunity for me to make these remarks.

Senator McCASKILL. Thank you very much, Mr. Graham.

Mr. McKelvy.

**TESTIMONY OF MICHAEL MCKELVY,<sup>1</sup> PRESIDENT AND DIVISION CHIEF EXECUTIVE, GOVERNMENT, ENVIRONMENT AND INFRASTRUCTURE DIVISION, CH2M HILL**

Mr. MCKELVY. Good afternoon, Chairman McCaskill and Ranking Member Johnson. Thank you for the invitation to appear here today to discuss contract management by the Department of Energy's Office of Environmental Management.

I will quickly summarize my written statement and ask that it be included in the record.

CH2M HILL is an employee-owned global engineering firm founded in 1946 and headquartered in Colorado. We have been recognized as an industry leader as judged by Engineering News Record.

CH2M HILL was the first firm in the heavily male-dominated engineering and construction industry to receive the prestigious Catalyst Award for our commitment to recruit, develop and advance women in the workplace.

And, most important to me, CH2M HILL was judged for the fifth year in a row as one of the world's most ethical companies by the Ethisphere Institute—the only U.S. firm selected from the construction industry.

Our success as a contractor can be attributed to our safety focus, our exceptional people and continually refined project delivery processes. Safety is always the first and foremost consideration for any CH2M HILL project or endeavor.

In the invitation letter, you outlined several areas for today's discussion. I will do my best to address those areas, the first being the management of environmental remediation contracts.

CH2M HILL has a successful record of performance managing and operating nuclear facilities and providing innovative cleanup and environmental remediation for the DOE since 1994. We have been responsible for the successful delivery of two of DOE's three largest closure projects—the Miamisburg Project and the Rocky Flats Project.

Not unlike some of the work we do for other Federal agencies, we typically set up joint ventures or special purpose entities to help provide diversity in skill sets and allow greater corporate reach-back for project support.

<sup>1</sup>The prepared statement of Mr. McKelvy appears in the Appendix on page 78.

CH2M HILL's work at the Hanford site dates back to the early 70s. Over the last 2 decades, CH2M HILL has had several large contracts at the Hanford site, including the Tank Farms Contract from 1999 to 2008 and, currently, the Central Plateau Remediation Contract which we have had since 2008.

DOE's use of cost-plus-award-fee contracts on the Hanford Plateau Remediation Company (PRC) project has allowed the DOE to meet specific objectives and standards, and make adjustments for changes in funding the work priorities, which provided us the flexibility as to best accomplish the work.

On the Idaho Cleanup Project, CH2M HILL is currently managing the safe cleanup of the Idaho National Laboratory. To achieve the cleanup goals as part the cost-plus-incentive-fee contract, our scope includes the treatment of 900,000 gallons of highly radioactive sodium-bearing waste currently stored in underground tanks.

As part of the contract, we have designed and constructed a first-of-a-kind facility—the Integrated Waste Treatment Unit (IWTU), to treat and prepare liquid radioactive waste for permanent disposal.

Early on, several issues hindered progress during the design-build phase that increased the complexity of the construction, resulting in push-back in startup of the facility. The most significant issue was the way in which seismic analysis has been conducted. This issue resulted in the DOE decision, at the urging of the Defense Nuclear Facilities Safety Board, to upgrade the hazards classification of the facility after preliminary design had already been completed.

Last, in 2008, a further 1-year delay in the project completion was the direct result of fiscal funding limitations. IWTU was originally estimated at \$379 million. However, due to the directed design and operational changes, we provided the government with a revised estimate of \$600 million to complete the project.

The contract was adjusted in 2010, and subsequently, a cost cap of \$533 million was established for IWTU, less than the validated estimate, and at which point we would pay for any of the additional costs over the 533. In addition, schedule incentives and penalties were established for the project completion date.

Last April, construction was completed at a final cost of \$621 million, with the parent companies of our joint venture contributing more than \$88 million to complete the construction. In addition, we earned no fee and incurred schedule penalties for not having the facility online by the contract period.

Despite these setbacks, we are extremely proud of the Idaho Cleanup Project's workforce and the great work accomplished over the years. And even with the issues at IWTU, the Idaho Cleanup Project contract was delivered in phase I over \$500 million below cost and to the satisfaction of the State of Idaho and the Department of Energy.

Our employees accepted great challenges and were empowered to come up with innovative solutions, resulting in this unprecedented success and a stellar record of safety. The safety of our workers, the public and the environment is our foremost value on the challenging and dangerous work across the EM complex.

Success has been possible because of the cooperative agreements between the three principal parties—Congress, the Department of Energy and the contractor community.

I would like to thank the Subcommittee for their time today, and with that, Madam Chairman, I would be pleased to answer any questions.

Senator McCASKILL. Thank you very much, Mr. McKelvy.  
Mr. Sheppard.

**TESTIMONY OF FRANK SHEPPARD, JR.,<sup>1</sup> VICE PRESIDENT AND  
DEPUTY PROJECT MANAGER, PARSONS CORPORATION**

Mr. SHEPPARD. Good afternoon, Madam Chairman, Senator Johnson. Thank you for having me here today to discuss the subject of contract management by the Department of Energy.

My name is Frank Sheppard. I represent Parsons and the Salt Waste Processing Facility currently being constructed at the Savannah River site near Aiken, South Carolina. I am the Deputy Project Manager for SWPF and have been with Parsons since September 2011.

SWPF is a large, complex, first-of-a-kind radioactive waste treatment facility. The mission of SWPF is to safely and efficiently segregate radioactive salt waste into products suitable for processing at the Defense Waste Processing Facility and the Saltstone Processing Facility, both of which are currently in operation. The SWPF facility is the last component needed in the liquid waste system at the site and is on the critical path for completion of DOE's cleanup mission at Savannah River.

When operational, this facility will process 100 million gallons of radioactive waste. The construction of the facility is currently over 72 percent complete, and we recently finished enclosing the facility with completion of the roof in February 2013, just 1 week past our contractual target milestone.

In 2001, the DOE issued a Critical Decision-0 (CD-0), cost range of \$673 million to \$2.6 billion. Although there have been cost increases for a number of reasons, the current Parsons contract is valued at \$1.7 billion, which is still just slightly above the median cost of the 2001 original CD-0 cost estimate.

Our focus throughout the project has been on safety, quality, schedule and cost. Parsons's safety performance on SWPF is good and is improving. The construction recordable injury rates are roughly half the industry average. Parsons believes in investing to continually improve safety as a core value and a fundamental principle of our business.

SWPF is unique for DOE or NNSA first-of-a-kind construction projects in that we have no major outstanding technical or regulatory issues in the design or construction of the facility.

Our contract requires a through-put of approximately 6 million gallons per year, and we are confident we will be able to process 9 million gallons a year. Parsons has tested a Next Generation Solvent that can increase the through-put capacity to more than 12 million gallons per year. This could dramatically reduce the oper-

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<sup>1</sup>The prepared statement of Mr. Sheppard appears in the Appendix on page 83.

ational life of the facility, save significant life cycle costs for the Department and accelerate major risk reduction at Savannah River.

There are several factors that have led to the cost increases associated with the SWPF project:

Changes in throughput capacity from 3 million gallons at the initial start of the contract to now 6 million gallons per year.

At Critical Decision-1, the contract required a performance Category 2 facility design.

In January 2006, DOE directed Parsons to begin preparation of an enhanced preliminary design to meet more stringent PC-3 seismic requirements.

The initial quality standard for SWPF was the International Organization for Standardization (ISO) 9001. In June 2009, DOE directed compliance with the Nuclear Quality Assurance (NQA-1) as the primary quality standard. The overhead associated with establishing and maintaining an NQA-1-compliant program carries significant cost implications.

For example, the cost of a piece of equipment can be 5 to 10 times higher than an identical piece of equipment manufactured to a less rigorous standard. The same cost burden is realized again on the construction site through extensive documentation, inspection, layers of oversight and testing.

The diminished ability of most nuclear-qualified vendors and suppliers to effectively meet NQA-1 on a consistent basis has caused significant cost growth on SWPF as well as many other DOE/National Nuclear Security Administration (NNSA) construction projects.

The most significant delay on the SWPF project was related to the manufacturing and delivery of our 10 large American Society of Mechanical Engineers (ASME) vessels. After initially awarding one subcontract, it became apparent the vendor could not provide the quality necessary for the large vessels. The contract was terminated, and a subsequent contract was awarded with the tanks delivered in June and July 2012, over 2 years later than originally planned.

This is not an isolated issue affecting just nuclear vessel manufacturers and persists with items such as pipes, bulk materials and valves.

Parsons has consistently worked to mitigate any scheduling and cost impacts while maintaining the high degree of safety and quality necessary on a DOE project. Given the extensive delay in delivery of the large vessels, Parsons effectively built the facility around the area of the vessels and then safely lifted and placed the vessels into the facility.

We recently signed a contract modification with DOE that incorporates all of the additional costs associated with the challenges and the impacts I have spoken to earlier. This modification establishes a cost cap type of contract for completion of construction. Parsons has assumed significant liability with this type of contract where we are committed to deliver construction complete on or ahead of schedule and at or below the target cost.

In conclusion, we have no outstanding technical or regulatory issues relative to resolve at SWPF. Parsons and DOE have agreed

on a path forward to complete construction no later than December 2016.

We are working with DOE to negotiate the path forward for the remainder of the contract.

We will continue to propose new and innovative concepts to DOE that can potentially reduce overall life cycle costs.

We are confident that we will deliver a facility that will successfully complete startup, will provide a safe operational environment for the workers, will significantly outperform the contractual capacity requirements and will provide significant risk reduction at the Savannah River site.

Thank you for the opportunity to speak with you today. I am happy to answer any questions you have.

Senator MCCASKILL. Thank you so much.

We only have about 12 minutes, I am afraid. So I am going to try to just briefly get in the questions in about half that time and turn it over to my colleague.

And, obviously, there will be more questions we will ask of you for the record since our time has been curtailed with the unfortunate timing of votes this morning.

First, let me say I really appreciate that you are here. This Committee has run into trouble with some companies that do business with the government not wanting to come in front of this Committee. So I appreciate that you are here and willing to answer questions.

And I also appreciate the fact that doing business with the government is no walk in the park. I understand that this is a complex area. If the government was not involved—and you layer in the involvement of not just the Department of Energy but all the regulatory layering you have both at the State level and at the national/Federal level, and I am appreciative of that.

Let me see if I can get a yes or no answer from all three of you to this question. Do you believe that EM has the necessary internal expertise to oversee your contracts, yes or no, Mr. Graham?

Mr. GRAHAM. Yes, I do.

Senator MCCASKILL. Mr. McKelvy.

Mr. MCKELVY. Yes, I do.

Senator MCCASKILL. Mr. Sheppard.

Mr. SHEPPARD. Yes, I do.

Senator MCCASKILL. OK. Briefly, on contractor whistleblowers, I have worked very hard to expand the protection of whistleblowers beyond government employees to employees of contractors who do primarily government work. We have successfully done this in the 2013 Defense Authorization Act.

This is kind of a yes or no question, too. Have you received any direct guidance from the Department of Energy in terms of how potential whistleblowers should be handled?

Do you know, Mr. Graham?

Mr. GRAHAM. I do not recall.

Senator MCCASKILL. You do not know.

Mr. MCKELVY. No specific direction.

Mr. SHEPPARD. Not since I have been on a project, since 2011.

Senator MCCASKILL. We will take care of that because we want to make sure that you are getting some specific guidance on that.

Earlier this year, CH2M HILL entered into a settlement with the Department of Justice (DOJ) for a timecard fraud at Hanford. For years, employees falsified timecards. Under the settlement, HILL admitted not only did certain members of management know this timecard fraud was ongoing, but some supervisors actively helped to conceal it.

Are any of the employees, supervisors or management who participated in, or who were aware of, this fraud still working at Hanford?

Excuse me. I looked at the wrong one. Sorry.

Mr. MCKELVY. Yes, that is for me. Thank you.

To my knowledge, the employees who were directly affected with that issue have terminated or are no longer with CH2M HILL or under disciplinary action.

Senator MCCASKILL. And does that include the supervisors who were aware of this and did nothing to stop it or just the ones who were doing it?

Mr. MCKELVY. I believe it is both.

Senator MCCASKILL. OK, if you would followup with that—

Mr. MCKELVY. Yes.

Senator MCCASKILL [continuing]. And make sure. I think this is something that obviously people who were responsible for that—I certainly understand that you can have wrongdoers in a business operation and have the head of operation not know about it. But, when they are discovered, we want to make sure that the head of the organization, the head of the company, takes care of it—

Mr. MCKELVY. Absolutely.

Senator MCCASKILL [continuing]. Particularly in working with the government.

Mr. MCKELVY. It is how you respond that makes the difference.

Senator MCCASKILL. That is exactly right.

And, finally, for me—and then I will turn it over to Senator Johnson and I will have a number of questions for you for the record—would it be worthwhile for DOE to obtain more independent cost estimates of its projects? [Pause.]

Anybody can jump in here.

Mr. SHEPPARD. Well, I think, if I could, since we just concluded contract negotiations, DOE does have not only internally, but they contract out to firms like Project Time and Cost that do independent government cost estimates on the government side.

I think for unique, first-of-a-kind projects, the challenge is trying to get the right factors and the right historical costs on one-of-a-kind type projects to do an adequate job of predicting costs in the future.

Senator MCCASKILL. Well, you know, I am glad you jumped in, Mr. Sheppard, because the example that piqued my interest in this area was, in fact, the facility where you are working. The current estimated cost was \$1.2 billion, and GAO said an independent estimate by DOE's cost analysis said that it was \$2.7 billion. But, yet, it is still currently estimated at something much closer to \$1.2 billion.

So it is almost as if they are doing some of this but paying no attention to it.

Mr. SHEPPARD. They do that. There are certain elements of a cost estimate, mainly the contingency piece, that takes into account the unknown risks that are frequently experienced on first-of-a-kind projects—some of the things that are directed changes through design and seismic requirements. The others are things associated with the NQA-1 atrophy of the supply chain that are just unknown, unanticipated and very hard to bound.

So I think you will see a broad range. Even when you look at the CD-0 estimate, the initial estimate by DOE was between \$673 million to \$2.6 billion back in 2001. That includes a large part of contingency, some of which we have experienced on SWPF.

Currently, our recent mod to the contract—Parsons is at \$1.7 billion. So we are right about the mid-range of the original 2001 estimate, but a large part becomes how much of the contingency is realized during the execution of the project.

Senator MCCASKILL. Wouldn't we be better off to go with the higher estimates, though, than the lowest?

It seems like to me that what we have done on a consistent basis, if you look at the history of these contracts, is we have low-balled all of them.

Mr. SHEPPARD. I think it would—

Senator MCCASKILL. And then come back and—

Frankly, it makes contract oversight look shoddy. It makes it look like that somehow you all are not doing your best work when I am sure that you are trying to estimate costs accurately.

Shouldn't we be trying to influence this process in terms of an oversight function, to say, hey, quit low-balling these estimates and let's be honest up front what this stuff is going to cost?

Mr. SHEPPARD. I think you would be in a much better position to take a more conservative estimate up front, particularly on first-of-a-kind nuclear construction projects.

Senator MCCASKILL. OK. Senator Johnson.

Senator JOHNSON. Thank you, Madam Chairman.

Senator MCCASKILL. Just call you, right?

Senator JOHNSON. Right. I appreciate your holding this hearing. This was very informational, and I think important.

And I certainly want to thank the witnesses for coming forward as well.

I will quickly give you an opportunity—I believe you were sitting through the first panel. Anybody want to comment on anything said that was just burning at you, just listening to it, or not? [Pause.]

That is fine.

Is there one thing in dealing with the EM in this regard—the Department of Energy—that you think would dramatically improve project management?

Mr. Graham, I will start with you.

Mr. GRAHAM. I think we talked about it earlier, in terms of meeting these regulatory milestones and establishing regulatory milestones that are years in front of us, somehow being able to work a regulatory framework and a funding certainty framework that will allow us to better work with the regulators to deliver their requirements.

Senator JOHNSON. Mr. McKelvy.

Mr. MCKELVY. As was said by Mr. Surash in the panel, it would be wonderful if there was a 5-year funding stream identified because often the projects are directed to clean up one area; then all of a sudden the funding is attained for another area, and then everyone has to change and move to a different area. And it is not quite systemic or under some kind of order.

You couple that with other regulatory agencies—the Environmental Protection Agency (EPA), et cetera—that seem to sometimes have a different strategy and a different goal from the DOE EM has.

And there could be better partnership with all the regulators, the other agencies as well, in terms of what the end goal is.

Senator JOHNSON. Mr. Sheppard.

Mr. SHEPPARD. I think we touched upon some of that, mainly with finding the true scope of what the project is and what you want—in this case, capital—large construction projects to achieve in the end and then having a bounding cost estimate that is realistic and accounts for all of the contingencies that may happen on these types of projects.

The thing that was not discussed this morning that you have to consider is the overall life cycle costs. Although we are focused on the cost of these projects, as with SWPF, it is a critical element to significantly reduce overall life cycle costs—so not only consider the costs associated with the initial project but how it fits into the overall mission at Savannah River and the overall life cycle costs, which are substantial on an annual basis.

Senator JOHNSON. With these one-of-a-kind projects, is it possible to properly define the scope of the project, Mr. Graham?

Mr. GRAHAM. I think it is quite the challenge. And I think, again, we have gone into these with phases where you fund a phase of the work, get that locked down and then move ahead.

But my point I made earlier—in terms of trying to meet the regulatory framework, I think DOE often gets themselves ratcheted into—as Jack Surash put it, you are trying to deliver; you are trying to make commitments.

And, again, we are dealing with, I think, our toughest problems right now in DOE.

Senator JOHNSON. Mr. McKelvy.

Mr. MCKELVY. I think that there could be a better job done of scoping and costing the facilities with all of the factors that could be encountered up front.

The IWTU facility, for example, at the time that the baseline cost was determined, there was not the input from the Defense Board that increased the seismic requirements, and then there were other inputs from previous DOE management that wanted the facility to have structural integrity for future calcine processing. If those things had been known at the very beginning, before the construction had started and before the design was done, then the baseline would have been much more accurate.

Senator JOHNSON. Was it possible to know that ahead of time? In defense of the government, I mean.

Mr. MCKELVY. There could have been earlier involvement from the Defense Board, certainly, and perhaps the longer-scale plan for the calcine process could have been factored in.

Senator JOHNSON. OK. Mr. Sheppard, do you want to comment?  
Mr. SHEPPARD. I think it is basically the same thing. It is just the timing of the changes, whether they are DOE directed changes or throughput changes.

And, if you look at the larger, complex facilities—the Parsons contract was awarded in 2002, and construction started in 2008.

So, when you have a span of 6 years, things are going to change. People are going to want to have facilities designed and built safer. But, whenever you have major changes in the middle of design, it causes significant impacts that usually are not felt and realized until much later down the road.

Senator JOHNSON. Who primarily drives those changes?

Is that from the Safety Board?

Is that the government?

Is that, as you are going through the design phase, you are raising red flags?

Or, all of the above?

Mr. Graham.

Mr. GRAHAM. I think it is all of the above.

Senator JOHNSON. OK

Mr. GRAHAM. Yes, I think. Again, if you look at the waste treatment plant, for example, there was a change in the seismic requirements after we got started.

And so, again, as we talked about, anytime you are adding new requirements when you are in the middle of the job, whether you are building one of these complex factories or whether you are building a house, if you have to change the insulation and go back rework things, it is an expensive trip.

Senator JOHNSON. From the first panel, it seemed like the direction we were moving was trying to bring these contracts into smaller bite-sized pieces. Would that be helpful or harmful, Mr. Graham?

Mr. GRAHAM. I think that it—you have to weigh whether cutting it into smaller pieces makes it more manageable for the pieces. But then how do you integrate the pieces that have to come together?

And so I think that—

Senator JOHNSON. That kind of speaks to really defining the scope of the project. We really need something pretty large on the front end, and then maybe—so define the scope, take a little more time on the scope of the project and then break it down into bite-sized pieces?

Mr. GRAHAM. You could break down into some pieces. But again, at the end of the day, if you look at a facility like the waste treatment plant, where there is major, large facilities that have to interact together, it does not lend itself, I think, to splitting it into small parts.

Senator JOHNSON. OK. Mr. McKelvy, it looked like you wanted to weigh in.

Mr. MCKELVY. Yes, sir. On the projects that are design-build projects, construction projects, that is one—usually one contractor, one piece, one budget.

When you look at the overall cleanup of a 500-square-mile site, there are various, discrete pieces of the work that are all budgeted and costed in. Whether they were contracted separately or not,

they are still identified and funded by the DOE on a per-project basis.

So, the other aspect of this is that, sure, the scope can change on a building—a first-of-a-kind building. But often we will get into some remediation, and we will have thought from the information from the 40s and 50s that there are 1,000 drums of waste buried 40 feet underground, and when you dig it up you find that there is 2,000 or 3,000.

And so it is the dynamic scope change of the circumstance, of the complexity of the work.

Senator JOHNSON. OK. Again, thanks for your testimony.

And thank you, Madam Chairman.

Senator MCCASKILL. We really appreciate your being here. We will get some questions to you for the record since our time was curtailed today.

And I am glad that we had this hearing. I think it was very helpful.

I hope you found it helpful and not, you know, as somebody accused us of always trying to shoot fish in a barrel. I hope you did not feel like you were fish, and I hope you did not feel like you were in a barrel.

Thank you very much.

[Whereupon, at 1:02 p.m., the Subcommittee was adjourned.]



# A P P E N D I X

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Statement of Gregory H. Friedman

Inspector General

U.S. Department of Energy

Before the

Subcommittee on Financial and Contracting Oversight

Committee on Homeland Security and Governmental Affairs

U.S. Senate

"Contract Management by the Department of Energy"

FOR RELEASE ON DELIVERY

10:30 AM

June 27, 2013

Madam Chairman and Members of the Subcommittee, I am pleased to be here at your request to testify on the Office of Inspector General's perspective on contract management by the Department of Energy's Office of Environmental Management (EM).

With the end of the Cold War, the Department's environmental remediation mission has taken on great importance. The agency is responsible for disposing of large volumes of radioactive, hazardous and mixed waste resulting from more than 50 years of nuclear defense and energy research work. Although largely centered at sites that were essential components of the U.S. nuclear weapons program – such as Richland, Washington; Savannah River, South Carolina; and Oak Ridge, Tennessee – the effort involves 2 million acres of land located in 13 states and employs more than 30,000 individuals, including scientists, engineers, and hazardous waste technicians. Cleanup activities range from addressing contamination at uranium processing sites to safely disposing of millions of gallons of extremely hazardous nuclear and chemical waste generated through decades of weapons production activities. The aggregate disposal and cleanup costs associated with these efforts currently represent an unfunded liability of over \$266 billion. The associated tasks are scheduled to continue for decades.

The Department almost exclusively relies on contractors to meet its mission needs, even for its most sensitive national security efforts. The environmental remediation program is no exception. To put this in perspective, according to the Department, EM activities are being conducted through more than 40 prime contracts having a total value of over \$90 billion.

**Office of Inspector General Activities**

Since 2003, the Office of Inspector General has identified both Contract Management and Environmental Cleanup as key Department of Energy Management Challenges. Consequently, we have focused a considerable amount of our resources on evaluating the Department's performance in these areas. Our reviews have recognized significant contract administration, project management, cost and schedule estimating, and quality assurance problems – concerns that have undermined the effectiveness and efficiency of the EM effort.

I want to highlight four recent reviews that identified opportunities to improve the management of cleanup projects across the complex.

**K Basins Sludge Treatment**

In February 2011, we reported that the Department had not effectively managed the sludge treatment phase of its Spent Nuclear Fuel project located at the Hanford Site.<sup>1</sup> In particular, we reported that largely due to project management issues, the Department found it necessary to abandon a contractor-developed approach to retrieving, oxidizing and assaying sludge that had accumulated in spent nuclear fuel storage basins. This action was taken after approximately 3 years of effort and the expenditure of \$43 million. We found that the Department had not required an alternative analysis of potential solutions to determine the best means of meeting mission goals and mitigating cost, schedule, environmental, safety and health risks related to this project. The Department also permitted the contractor to proceed with design, long-lead

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<sup>1</sup> *The Department of Energy's K Basins Sludge Treatment Project at the Hanford Site*, DOE/IG-0848, available at: <http://energy.gov/sites/prod/files/igprod/documents/IG-0848.pdf>.

procurements, and construction before approving the preliminary safety and hazard analysis. After completion of that analysis and during acceptance testing, the Department finally determined that the system had been designed without important safety features necessary to protect workers from radiation contamination.

*K-25 Environmental Cleanup*

In July 2011, we noted that the original \$622 million baseline for the decontamination and decommissioning of the K-25 building in Oak Ridge, Tennessee, had not been updated, despite projections that total costs could increase to as much as \$1.2 billion.<sup>2</sup> Notably, we found that due to contract and project management weaknesses the Department was not in a position to fully grasp the ultimate cost and time required to complete the project. In fact, as early as 2010, contractors responsible for completing the project had exceeded the original baseline, even though the effort was far from completion. We found the Department had not:

- Confirmed that contractor reports on cost and schedule performance were accurate and reliable;
- Performed timely analyses to evaluate the merit of outstanding issues described in contractor requests to increase the contract award, and as a result, the Department may not have fully understood the scope and severity of the outstanding technical challenges;
- Organized the management of the K-25 effort as a stand-alone project to give it the necessary management visibility;

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<sup>2</sup> *The Department of Energy's K-25 Building Decontamination and Decommissioning Project*, DOE/IG-0854, available at: <http://energy.gov/sites/prod/files/igprod/documents/IG-0854.pdf>.

- Periodically adjusted its approach to managing the K-25 cleanup effort despite numerous events that should have prompted such a reassessment; and,
- Ensured consistent Federal leadership to oversee the Project.

Waste Treatment and Immobilization

In April 2012, we reported on problems with the Department's \$12.2 billion construction of the Waste Treatment and Immobilization Plant (WTP) in Hanford, Washington, a project that the U.S. Government Accountability Office (GAO) recently identified as having a projected cost three times larger than its original budget. We found that contractor management of this project, one of the largest undertakings of its kind, did not always meet quality assurance and contract requirements.<sup>3</sup> To shield plant workers from intense radiation during WTP operations, processing vessels would be located in sealed compartments called black cells. Because there is no engineered access to black cells once operation begins, it is critical that processing vessels last for the WTP's 40-year expected design life without in-service inspection and maintenance. However, the contractor procured black cell vessels that were missing required records of examinations, which are intended to provide evidence that welds to the vessels met specifications. As we reported, this was inconsistent with the project's quality assurance process.

We also found that the Department paid the WTP contractor a \$15 million incentive fee for production of a vessel that was later determined to be defective. Our review disclosed that

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<sup>3</sup> *The Department of Energy's \$12.2 Billion Waste Treatment and Immobilization Plant—Quality Assurance Issues—Black Cell Vessels*, DOE/IG-0863, available at: [http://energy.gov/sites/prod/files/IG-0863\\_0.pdf](http://energy.gov/sites/prod/files/IG-0863_0.pdf).

although the Department demanded return of the fee, it was never actually reimbursed. Department management told us the \$15 million incentive fee payment issue was included as consideration as part of the WTP contract restructuring; however, management could not furnish documentation to explain or support the rationale for its decision to forego recovery of the fee.

#### Plateau Remediation

We reported in December 2012 that according to the contractor projections, the cost of the Plateau Remediation contract at Hanford, originally awarded in 2008 for \$5.6 billion, had grown by \$1.1 billion.<sup>4</sup> We found that the contractor had not always met contract and Federal Acquisition Regulation requirements for submitting timely and/or well supported contract change proposals. Specifically, the contractor was unable to prepare properly supported projections necessary for Federal officials to evaluate recommended contract cost and scope changes, despite several attempts. As such, the Department was not always able to effectively measure the contractor's performance because it did not have reliable estimates to measure against actual cost performance. This matter was complicated by the fact that the Department had not always formally notified the contractor of needed changes to the work scope in a prompt manner. In the absence of timely and reliable cost information, management lacked a basic tool necessary for making sound decisions regarding tradeoffs in funding of numerous project alternatives.

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<sup>4</sup> *The Management of the Plateau Remediation Contract*, OAS-L-13-03, available at: <http://energy.gov/sites/prod/files/OAS-L-13-03.pdf>.

**Improvements Needed**

Over the years, there have been a number of successful remediation efforts at certain Department sites and facilities, most notably the closure of the Rocky Flats Plant in Colorado.

However, significant problems with contract administration and project management have adversely impacted the Department's ability to achieve program goals and to effectively manage the many issues confronting its multi-billion dollar environmental cleanup effort. The frequency and recurring character of many of these concerns, as has been reported by my office, GAO, the Defense Nuclear Facilities Safety Board and other internal and external review bodies, leads to the inescapable conclusion that they are systemic in nature.

The Department's environmental remediation effort faces significant technological challenges. Its size is unprecedented and the maze of contracts, contract types, contractor teaming relationships, subcontracts, and consulting agreements is extremely complex. Yet, there are several "common threads" that appear central to the contract and project management problems facing the program. Improvements are needed to ensure that:

- Project scopes are realistic and manageable, recognizing the technical challenges facing many Department environmental remediation efforts;
- Change control management is adequate and project baselines are updated on a real time basis to maintain effectiveness as a primary management tool;
- Contract terms are kept current to track with project events;
- Contractor performance is measured against established metrics, including realistic and reliable cost estimates;

- Federal staffing is sufficient, in terms of size and expertise, to provide effective contract and project oversight and ensure that crucial safety requirements are adhered to; and,
- Projects have focused, empowered and consistent Federal Project Manager leadership throughout their lifecycle.

When problems arise, early detection is key. Prompt and candid reporting by contractors, and timely and responsive actions by Federal officials, allow for: (1) thoughtful consideration of alternative courses of action; (2) expedited implementation of corrective measures; and (3) maintenance of effective project baseline against which contractor performance and requests for changes to the contract scope and costs can be evaluated.

Our audit, inspection, and investigation strategies are risk-based. Consequently, the Department's EM efforts continue to be a prime focus of the Office of Inspector General. Notably, we are nearing completion on a review of alleged design quality problems at the Waste Treatment Plant.

Madam Chairman and Members of the Subcommittee, that concludes my statement and I will be happy to answer any questions you may have.

TESTIMONY OF  
DR. PETER S. WINOKUR, CHAIRMAN  
DEFENSE NUCLEAR FACILITIES SAFETY BOARD

SAFETY OVERSIGHT OF DEPARTMENT OF ENERGY  
DEFENSE NUCLEAR FACILITIES

SUBCOMMITTEE ON FINANCIAL AND CONTRACTING OVERSIGHT  
COMMITTEE ON HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS

UNITED STATES SENATE

JUNE 27, 2013

**MADAM CHAIRWOMAN AND MEMBERS OF THE SUBCOMMITTEE:**

Thank you for the opportunity to testify on nuclear safety issues for clean-up work at defense nuclear facilities operated by the Department of Energy (DOE). This is a period of significant transition for DOE, which includes billions of dollars in construction projects and a huge portfolio of site clean-up work. The Defense Nuclear Facilities Safety Board (Board) believes it is prudent to proactively address safety issues at DOE's defense nuclear facilities to ward off threats to public health and safety. The Board continues to champion the early integration of safety in the design of new facilities, efforts to improve the safety culture in DOE's federal and contractor workforce, and the need to strengthen the protection of workers through improvements in work planning and conduct of operations at DOE's defense nuclear facilities.

I understand that the Subcommittee is interested in the Board's role in oversight of major design and construction projects, including the Waste Treatment and Immobilization Plant at the Hanford site and the Salt Waste Processing Facility at Savannah River. In addition, the Board has been asked to comment on safety culture, including risk assessment and quality assurance processes, and ongoing safety concerns at DOE defense nuclear facilities. Today I will start with some background on the Board's mission, how we operate, and our role in DOE's design and construction projects. Then I will summarize DOE's process for managing the acquisition of capital assets, describe the Board's initiative on integrating safety early in design for such projects, and highlight the issues the Board has raised for several of DOE's major defense nuclear facility design projects. I'll conclude with a brief discussion of federal oversight and safety culture.

**Statutory Mission and Operations of the Board**

The Board was created by Congress in 1988. The statutory mission of the Board is to *provide independent analysis, advice, and recommendations to the Secretary of Energy to inform*

*the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of the Department of Energy, in providing adequate protection of public health and safety at such defense nuclear facilities.* The Atomic Energy Act of 1954, as amended, currently establishes two categories of facilities subject to Board jurisdiction: (1) those facilities under the Secretary of Energy's control or jurisdiction, operated for national security purposes that produce or utilize special nuclear materials; and (2) nuclear waste storage facilities under the control or jurisdiction of the Secretary of Energy. The Board's jurisdiction does not extend to facilities or activities associated with the Naval Nuclear Propulsion Program, offsite transportation of nuclear explosives or materials, the U.S. Enrichment Corporation, facilities developed pursuant to the Nuclear Waste Policy Act of 1982 and licensed by the Nuclear Regulatory Commission, or any facility not conducting atomic energy defense activities.

Under its enabling statute, 42 U.S.C. § 2286 *et seq.*, the Board is responsible for independent oversight of all programs and activities impacting public health and safety within DOE's defense nuclear facility complex—a complex that has served to design, manufacture, test, maintain, and decommission nuclear weapons and has served other national security purposes. To effectuate its oversight mission, the Board is statutorily mandated to review the content and implementation of DOE standards, facility and system designs, and events and practices at DOE defense nuclear facilities that the Board determines have adversely affected, or may adversely affect, public health and safety. The Board is further authorized to access and analyze any information related to a DOE defense nuclear facility.

In support of its mission, the Board may conduct investigations, issue subpoenas, hold public hearings, gather information, conduct studies, establish reporting requirements for DOE, and take other actions in furtherance of its review of health and safety issues at DOE defense nuclear facilities. These powers facilitate accomplishment of the Board's primary function to independently oversee the safety of DOE's defense nuclear facilities. The Secretary of Energy is required to cooperate fully with the Board and provide the Board with ready access to such

facilities, personnel, and information the Board considers necessary to carry out these responsibilities.

*Board Safety Recommendations*

The Board is required to make recommendations to the Secretary of Energy that the Board believes are necessary to ensure adequate protection of public health and safety. In this regard, the Board's actions are distinguishable from a regulator because the Secretary may accept or reject the recommendations in whole or in part. To enhance collaboration between the Board and DOE, the Board's enabling legislation was revised by the National Defense Authorization Act for Fiscal Year 2013 to require the Board to provide its safety recommendations to the Secretary of Energy in "draft" form, and to allow the Secretary 30 days to comment on the draft recommendations before they may be finalized and made available to the public.

Under its statute, the Board must consider the technical and economic feasibility of implementing its recommended measures. The Board is not required to refrain from issuing a safety recommendation based on either consideration. Nonetheless, in formulating its recommendations to the Secretary of Energy, the Board is confident that it has considered the technical and economic feasibility of each of its recommendations. On February 14, 2013, the Board issued a report to the congressional defense committees regarding how the Board considers the technical and economic feasibility of implementing its recommended measures.

Another revision to the Board's enabling legislation in the National Defense Authorization Act for Fiscal Year 2013 directed the Board to "specifically assess risk (whenever sufficient data exists)" in making its recommendations. Consistent with commercial nuclear industry practices, an assessment of risk involves an evaluation of (1) what can go wrong, (2) how likely it is, and (3) what its consequences might be. In performing a risk assessment the Board takes many factors into account including: (1) Proximity to collocated workers and the offsite public; (2) Quantity, chemical composition, physical form, and radiological

characteristics of material stored or handled in the facility; (3) Mechanisms for release of materials (e.g., earthquakes, tornados, chemical reactions, fires, explosions, and other potential energy sources), nuclear criticality, highly energetic violent reactions involving nuclear explosives, and nuclear detonations; and (4) Complexity of safety controls and the degree of reliance on active safety systems or administrative controls instead of passive design features.

The Board is very mindful of the need for efficient and cost-effective solutions to safety problems at defense nuclear facilities and performs independent oversight of DOE's evaluation of options for mitigating hazards. These options may include factors such as the remaining life of the facilities, schedules for replacing them, and means to mitigate disruptions to ongoing operations that may result from recommended safety improvements. However, the Board has no authority to specify a particular solution; that authority is the Secretary's alone.

Under the Board's statute, the Secretary of Energy may "accept" a Board recommendation but make a determination that its implementation is impracticable because of budgetary considerations or because the implementation would affect the Secretary's ability to meet the annual nuclear weapons stockpile requirements. The Secretary must report any such decision to the President and to various congressional committees. The Secretary of Energy has never made a determination that a Board recommendation cannot be implemented due to budget impracticability. The Board believes it has executed its statute in a faithful and responsible manner.

If the Board were to determine that a recommendation relates to an imminent or severe threat to public health and safety, the Board would be required to transmit the recommendation to the President, as well as to the Secretaries of Energy and Defense. After receipt by the President, the Board is required to make such recommendations public and transmit them to the Committees on Armed Services, Appropriations, and Energy and Commerce of the House of Representatives and the Committees on Armed Services, Appropriations, and Energy and

Natural Resources of the Senate. Throughout its history, the Board has never made a determination of imminent or severe threat to the public.

*Design and Construction of Defense Nuclear Facilities*

One of the Board's functions is to review the design and construction of DOE defense nuclear facilities. The Board's enabling statute describes this function as follows:

"The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility."

The Board does not impose requirements on DOE's capital projects or other activities. The Board operates by ensuring that DOE identifies a satisfactory set of safety requirements for a project or operation, and then by evaluating DOE's application of those requirements. The safety requirements are embodied in DOE's directives and/or invoked in national consensus standards. For example, the requirement that facilities withstand seismic events and other natural phenomena hazards is a DOE requirement that is implemented in a graded fashion, including consideration of the hazard associated with the facility. The requirement to assess the probabilistic seismic hazard analysis for DOE facilities built in seismically active areas every decade is likewise a DOE requirement. By keeping these analyses up to date, DOE is able to incorporate the best information available about the earthquake hazards at each site, which is

vital to ensure that all DOE facilities—both existing and proposed—provide adequate protection for seismic events.

The Board provides periodic reports to Congress on the status of significant unresolved technical differences between the Board and DOE on the design and construction of DOE's defense nuclear facilities. The Board receives positive feedback from congressional staff on these reports and believes they serve the useful purpose of keeping all parties apprised of the Board's concerns with new designs for defense nuclear facilities. The safety issues described below have all been documented in the Board's periodic reports, along with many other issues for DOE's design and construction projects.

#### **DOE Process for Managing Design and Construction Projects**

DOE manages its design and construction projects through DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*. DOE Order 413.3B organizes the project life cycle by project phases and critical decisions (CDs) progressing from broadly stated mission needs into well-defined requirements for the project, with the development of the safety strategy and the identification of safety structures, systems, and controls progressing in a similar fashion. The critical decisions serve as major milestones approved by the DOE Acquisition Executive and mark an authorization to increase the commitment of resources to the project. For projects with a total project cost greater than or equal to \$750 million, the critical decisions must be proposed by the appropriate Program Secretarial Officer and approved by the Deputy Secretary. The critical decisions and required safety documentation are:

- CD-0, Approve Mission Need. There is a need that cannot be met through other than material means;
- CD-1, Approve Alternative Selection and Cost Range. The selected alternative and approach is the optimum solution; Conceptual Safety Design Report;

- CD-2, Approve Performance Baseline. Definitive scope, schedule and cost baselines have been developed; Preliminary Safety Design Report;
- CD-3, Approve Start of Construction/Execution. The project is ready for implementation; Preliminary Documented Safety Analysis; and
- CD-4, Approve Start of Operations or Project Completion. The project is ready for turnover or transition to operations, if applicable. A Documented Safety Analysis (DSA) is required per the requirements of DOE's Nuclear Safety Management Rule, 10 CFR 830, Part B. The DSA essentially serves as a license to operate the facility in a safe and reliable manner.

The resulting process is consistent with the core functions and guiding principles of Integrated Safety Management (ISM), as described in DOE Policy 450.4, Integrated Safety Management Policy. It implements the applicable ISM core functions—define the work, analyze the hazards, and establish the controls—necessary to provide protection of the public, workers, and the environment. The process also addresses important guiding principles of ISM through identification of safety standards and requirements and development of hazard controls tailored to the work to be performed. The process includes documentation and timely review of safety design evolution to ensure feedback and improvement as the project advances.

#### **Board Initiative on Early Integration of Safety in Design**

The Board believes that safety serves as an enabler to DOE's mission. In the area of new design and construction, identifying safety issues and their mitigation or avoidance early in the design process provides for adequate protection of the public, including the worker, in a manner that adds little or no cost to the project. DOE projects that undergo significant redesigns late in the project design or even worse during construction frustrate the benefits of early identification and resolution of safety issues. Such flaws in the design process have in the past typically increased costs and delayed operations while corrections were made. With DOE's design and

construction costs on the order of \$20 billion, fractional increases in project costs can equate to large dollar amounts.

The Board conducted four public meetings between 2005 and 2008 to explore the need to integrate safety early into the design process for DOE defense nuclear facilities under DOE Order 413.3 and develop corrective actions to improve the integration of safety in design. DOE acknowledged that safety was not being integrated consistently into the early stages of the design of new defense nuclear facilities. DOE's senior leadership strongly supported the Board's effort to improve this situation. In a memorandum to DOE elements dated December 5, 2005, the Deputy Secretary of Energy stated, "I expect safety to be fully integrated into design early in the project. Specifically, by the start of the preliminary design, I expect a hazard analysis of alternatives to be complete and the safety requirements for the design to be established. I expect both the project management and safety directives to lead projects on the right path so that safety issues are identified and addressed adequately early in the project design."

In a joint report to Congress on July 19, 2007, the Board and DOE agreed that early integration of safety in design is both crucial and cost-effective, as it avoids schedule delays as compared to the case when safety issues are recognized late in the design process or worse, after construction has commenced. In most cases, the types of safety measures needed to meet DOE's safety requirements are a small fraction of the cost of the project. The same principle applies to oversight of operations—in an effective Integrated Safety Management system, hazards are recognized while the procedure for an operation is being developed, safety controls are built into the process, and the operation is then conducted safely and efficiently.

The safety in design initiative has resulted in DOE revising DOE Order 413.3 to describe more completely the safety requirements for design and construction; identify references to the required safety directives and standards; clarify the use of tailoring as applied to safety requirements; and improve roles, responsibilities, and oversight related to safety. DOE also issued a new standard, DOE Standard 1189, *Integration of Safety into the Design Process*, to

provide expectations for incorporating safety into the design process defined in DOE Order 413.3 to provide adequate protection for the public, workers, and the environment. DOE Standard 1189 incorporates the facility safety criteria in DOE Order 420.1B, *Facility Safety*, as a key foundation for achieving safety in design. DOE Order 420.1B includes important design objectives such as defense in depth—“multiple layers of protection to prevent or mitigate the unintended release of radioactive materials to the environment.”

The requirements provided in DOE Orders 413.3 and 420.1 and the expectations in DOE Standard 1189 provide for identification of hazards early in the project and the use of an integrated team approach to design safety into the facility. The basic precepts are as follows:

- Appropriate and reasonably conservative safety structures, systems, and components are selected early in project designs;
- Project cost estimates include these structures, systems, and components; and
- Project risks associated with safety structures, systems, and components selections are specified for informed risk decision-making by the project approval authorities

Assessment of risk is built into the safety-in-design methodology. DOE Order 413.3B requires projects to develop a Risk Management Plan in the conceptual design phase (i.e., before Critical Decision-1). The safety-in-design strategy is evaluated in a Risk and Opportunities Assessment that is required as an input to the Risk Management Plan. The Risk and Opportunities Assessment is intended to identify technical and programmatic risks early in design, so that opportunities to address the risks can be identified early enough to influence fundamental design decisions and inform project cost estimates. Executed properly, this assessment will lead to an appropriately conservative safety design and avoid surprises later in the project when significant changes would be costly and disruptive. The Risk and Opportunities Assessment is updated at each phase of design to allow the project to determine whether elements of the safety strategy conservatively identified early in design are still warranted, or

whether the continued development of the design, supporting technology, and safety analysis justifies changes.

#### **Safety Issues in Major Defense Nuclear Facility Design and Construction Projects**

As discussed above, DOE has significantly improved governing requirements and guidance for its capital asset projects. Following this guidance, the Salt Waste Processing Facility at the Savannah River Site and the Integrated Waste Treatment Unit at the Idaho Cleanup Project have largely succeeded in addressing safety issues early in design. However, the Waste Treatment and Immobilization Plant at the Hanford site continues to have major unresolved design and safety issues even though its construction is well over halfway complete. In addition to the early integration of safety in design, issues that tend to be common across DOE's design and construction projects are quality assurance, late design changes, and incorporation of new technologies before they are developed adequately.

#### ***Quality Assurance***

The commercial nuclear industry works to stringent quality standards in order to protect the health and safety of the public. DOE's Nuclear Safety Management Rule, 10 CFR 830, seeks to accomplish the same for DOE's nuclear facilities. Subpart A of the Rule establishes quality assurance requirements for "contractors conducting activities, including providing items or services, that affect, or may affect, nuclear safety of DOE nuclear facilities." The required quality assurance program must encompass all aspects of such activities, including training and qualification of personnel, design of items and processes, procurement of items and services, inspection and acceptance testing, performance of work, and independent assessments. This includes selecting and enforcing appropriate standards for everything from design work, to computer software and calculations, to construction methods such as concrete placement and welding, to operational practices and maintenance programs. However, regardless of the

requirements, a quality assurance program is only as effective as its implementation. Quality assurance is a management function—failures in quality assurance are failures in management.

Quality assurance has been a problem area for DOE's major defense nuclear facility design and construction projects. The contractors managing the two largest construction efforts currently being undertaken by the DOE Office of Environmental Management—the Salt Waste Processing Facility (SWPF) and the Hanford Waste Treatment and Immobilization Plant—have encountered significant problems in the quality of work of their subcontractors. The SWPF project experienced cost overruns and schedule delays due to vendor performance in meeting quality requirements for major equipment including the facility's large mixing vessels and also encountered quality problems in welding of piping systems by subcontractors that required a significant amount of rework. The Office of Enforcement in DOE's Office of Health, Safety and Security issued a consent order in April 2010 fining the SWPF project contractor for deficiencies in quality assurance oversight of its suppliers. And last year, DOE's Inspector General issued a report documenting the failure of the project contractor for the Hanford Waste Treatment and Immobilization Plant to comply with quality assurance requirements in the procurement of major vessels, as well as inadequate DOE oversight of the contractor's quality assurance process. Furthermore, many of the safety issues that the Board has identified in DOE's design and construction projects stem from inadequate assurance of the quality of engineering design and analysis, and of the testing programs that underpin process designs.

#### *Design Changes*

In addition to the specific problems discussed below for each of these projects, the Board has pointed out to DOE the recurring problem of DOE and its contractors altering safety-related aspects of the project designs without sufficient technical justification. Altering safety aspects of the design without adequately understanding the associated technical difficulties, complexities, or project risks involved can reduce the safety margin, create new safety issues, drive up costs, and imperil the success of the project. DOE Order 413.3B and DOE Standard 1189 provide that

safety features of the design should be decided upon during the conceptual design phase, before Critical Decision 1, and revised later only if there is a solid technical basis justifying the change. Adherence to this approach should improve the integration of safety and project efficiency in the future.

#### ***Hanford Waste Treatment and Immobilization Plant***

The Hanford Waste Treatment and Immobilization Plant (WTP) plays a vital role in DOE's waste clean-up program. Millions of gallons of high-level waste liquids and soluble saltcake that have been in storage for decades have no path to treatment and disposition unless these projects are successfully completed. Most of the tanks storing these wastes are well beyond their design life, and most of the remainder will be beyond their design life before they are emptied. The continuing hazard posed by these tanks has been made very obvious by the recently identified leaks in both single-shell and double-shell tanks at the Hanford Tank Farms.

WTP, under design and construction at an official estimated cost of \$12.263 billion, is essential to the safe stabilization and disposal of 53 million gallons of high-level waste stored in 177 underground tanks, some of which date back to World War II. WTP will perform complex, high-hazard radiochemical processing operations to pretreat and vitrify radioactive sludge, saltcake, and liquids with diverse chemical, physical, and radiological characteristics resulting from the various radiochemical processes used during decades of plutonium production at Hanford. The waste is not well-characterized. Although the various contractors that have operated the Tank Farms over the years have obtained many samples of wastes from tanks, the design of the tanks offers very limited locations for sampling, which precludes obtaining representative samples of settled sludges and saltcakes. The resulting uncertain characteristics of the waste feed make it vital that WTP use robust processes that can tolerate a broad range of chemical, physical, and radiological properties.

DOE awarded a design-build contract to the present project contractor in 2000 to design, construct, and commission the WTP. The project was challenging from the beginning because WTP is a one-of-a-kind facility that will treat a unique and diverse spectrum of wastes with very hazardous characteristics using technologies on a large scale that are unproven for these waste forms. In 2005, the scope of work was changed, but the technical analysis linking the design and safety strategy was not properly aligned. In 2006, the Secretary of Energy commissioned an External Flowsheet Review Team that performed an extensive review of the design of the WTP facilities. In its 2006 report, the team identified 17 major issues, defined as issues that would prevent WTP from operating consistently and would prevent it from meeting contract throughput rates. One of the major issues was the effectiveness of WTP's novel pulse jet mixing systems for process vessels. Vessels that use pulse jet mixing contain no moving parts; they contain pulse tubes that use compressed air and vacuum cyclically to draw in waste from the vessel and discharge it back into the vessel, agitating the waste in the process. Pulse jet mixing systems have not been demonstrated effective for the solids-laden wastes to be processed in WTP, and insufficient mixing could result in hydrogen explosions, nuclear criticality accidents, or mechanical damage within the vessels.

Further complicating matters, DOE began a significant redesign of the facility in 2009, when the design was already more than two-thirds complete and construction of the WTP facilities ranged from about one-quarter to halfway done. As part of the redesign, the project proposed removing or reducing many safety-related controls. The Board did not agree and was concerned that safety was not appropriately implemented in the design at this very late stage. The removal of controls was proposed despite the existence of numerous technical issues that still needed to be resolved and was not consistent with the principle of the early integration of safety in design. At its core, this use of technologies unproven for their applications in the WTP has resulted in DOE struggling to integrate safety into the design of a facility partially built. It also contributed to the development of an acrimonious relationship within the project contractor's organization between the people responsible for the safety basis and those who did

engineering. The acrimony made the resolution of safety issues extremely difficult and damaged the project's safety culture.

The Board is expending a significant portion of its resources evaluating the safety of the WTP design, many aspects of which continue to evolve. The Board has held three public meetings and issued more than 40 pieces of correspondence to DOE on safety issues for the WTP project, including formal recommendations to the Secretary of Energy on pulse-jet mixing systems (Recommendation 2010-2) and the project's safety culture, including DOE's role in that culture (Recommendation 2011-1). Several significant technical issues must be resolved to support completing the design and construction of the Pretreatment Facility and, to a lesser extent, the High-Level Waste Facility at the plant. Issue resolution is complicated by the partial construction of the facilities and the use of a "black-cell" design concept in certain areas that may not allow for maintenance during the 40-year life of the plant. Four key safety issues that require resolution are summarized below:

- The unproven effectiveness of the mixing and transfer systems, which are essential to the operation of WTP and are needed to prevent flammable gas from accumulating in process vessels and to prevent accumulations of solids, which could pose a nuclear criticality hazard (Recommendation 2010-2);
- Questions regarding the control strategy for flammable gas in process systems, which relies on quantitative risk analysis as a design tool, a novel approach for a defense nuclear facility;
- The need to demonstrate that erosion and corrosion of piping, vessels, and pulse jet mixer nozzles located in black cells are within allowable limits for the 40-year design life of the facility; and
- The unproven capability to characterize, control, and transfer waste from the Tank Farms to WTP in compliance with the waste acceptance criteria that must be met to allow the safe and successful operation of the WTP Pretreatment Facility.

Last year, in response to the numerous issues raised by the Board, DOE's project management and oversight organizations, and other reviewers, Secretary Chu undertook a comprehensive review of the plant's design. In a letter dated November 8, 2012, Secretary Chu informed the Board that this review may result in further changes to DOE's approach to resolving the mixing issues. However, Secretary Chu has now left office, and it is not clear what changes are in store. Meanwhile, DOE slowed the construction of two key facilities of the treatment plant, and the schedule for completion remains unclear.

#### ***Salt Waste Processing Facility***

The Salt Waste Processing Facility (SWPF) at the Savannah River Site is needed to pretreat millions of gallons of high-level waste liquids for immobilization and disposal. The project cost has been impacted by the delays related to acceptance of process vessels I discussed previously, but is presently on the order of \$1.7 billion. Its operations are similar to the Pretreatment Facility at the Hanford Waste Treatment and Immobilization Plant, but it is a simpler facility because it only handles salt solutions from the waste tanks, not sludge, and the associated vitrification, or glass-making, capability already exists in the Defense Waste Processing Facility at the Savannah River site. The facility design is essentially complete, and construction is about 71 percent complete. Development of this facility pre-dated the safety in design initiative, but the Board has monitored the project carefully. In 2009, the Board informed the Acting Assistant Secretary for Environmental Management that the Board had identified no safety issues that would preclude construction, but that a number of outstanding actions regarding safety-related systems needed to be resolved before completion of construction and operation of the facility. The Board has continued to evaluate the resolution of the safety issues and to analyze the details of the safety analysis and controls, such as flammable gas hazards in vessels and piping systems, to ensure that the facility will be safe to operate once construction is complete. The DOE/contractor project team continues to resolve the remaining issues successfully.

**Federal Oversight and Safety Culture**

Effective federal oversight and a healthy safety culture are essential elements in major facility design and construction projects. Without them, safety issues will not be addressed effectively in the design phase so that the resulting facility can be cost effectively designed and built, and operated safely. The Board has not always found these important elements to be in place. Based on concerns raised by employees, the Board investigated the safety culture of the WTP project and then issued Recommendation 2011-1, *Safety Culture at the Waste Treatment and Immobilization Plant*. A poor safety culture has broad practical impacts on the safe and efficient design, construction, and operation of facilities because it prevents engineers, operators and workers in general from identifying technical, quality, and safety issues to their management. The Board's recommendation specifically discussed the ways in which the poor safety culture on the WTP project was inhibiting technical and safety issues from being raised and resolved. In addition to recommending that DOE address the culture problems at WTP, the Board recommended that DOE conduct an extent of condition review to establish the extent of its safety culture problem.

As part of DOE's implementation plan for the Board's recommendation, DOE's Office of Health, Safety and Security undertook independent assessments of the safety culture at DOE's Office of Environmental Management, as well as several major design and construction projects across the complex. The Office of Health, Safety and Security, which plays a vital role in DOE's oversight, also subjected its own office to an assessment. The assessments were led by recognized experts in safety culture and found numerous problems. The extent and severity of the problems beyond the Hanford WTP project came as a surprise, particularly in the case of DOE headquarters and field offices. While some organizations fared better, the overall list of negative perceptions held by DOE and contractor employees about the attitudes and behaviors regarding safety in their organizations are sobering.

The Board is encouraged by the manner in which DOE's leaders are pursuing these assessments and their forthrightness in presenting the results. DOE's leaders are voicing strong commitment to a stronger safety culture throughout the DOE enterprise. This commitment is absolutely essential—an organization's leaders play a pivotal role in shaping its safety culture. A number of important actions remain under DOE's plan for implementing the Board's recommendation, including performing self-assessments at sites and facilities not assessed by the Office of Health, Safety and Security; integrating the findings across the complex into a coherent whole; and developing tools to sustain a robust nuclear safety culture throughout DOE's defense nuclear complex.

### **Conclusion**

DOE has developed a strong regulatory framework for design and construction projects, particularly in requirements to integrate safety early in design. However, the requirements and guidance are only as good as their implementation. Adhering to the well-thought-out processes defined in DOE Order 413.3B, DOE Standard 1189, and the associated guidance documents will set DOE up for the design, construction, and commissioning of defense nuclear facilities that can carry out their missions safely and efficiently. When safety issues are identified and mitigated or avoided early in design, their resolution has no impact on project cost and schedule. Achieving this result will require close oversight at all levels of project implementation to ensure that design and construction decisions are well-founded, analyses are complete and accurate, technology is of sufficient maturity, attention is given to quality assurance, and that expediency and short-term savings are not allowed to jeopardize the long-term safety and efficiency of the facility.

DOE's recent efforts to characterize and reinforce the importance of a strong safety culture across the defense nuclear facility complex have the potential to dramatically improve the willingness of workers to raise safety and technical issues on its projects and operations.

Combined with the improved project management framework, the potential exists for major improvement in project execution.

The Board seeks to ensure that oversight and decision-making processes that affect safety requirements in the DOE defense nuclear complex remain strong and technically defensible. The bottom line is that a nuclear accident is unacceptable to the public, the Board, and DOE.

The Board works diligently to communicate safety issues such as the ones I have described to DOE and our congressional oversight committees in a timely and constructive manner. These issues have been previously identified by the Board in public documents, such as letters to DOE, reports to Congress that summarize unresolved safety issues concerning design and construction of defense nuclear facilities, reports to Congress on aging facilities, and the Board's Annual Report to Congress. These reports and documents are available for review on the Board's public web site.

**Statement of J. E. "Jack" Surash  
Deputy Assistant Secretary for Acquisition and Project Management  
Office of Environmental Management  
United States Department of Energy**

**Contract Management by the Department of Energy's  
Office of Environmental Management  
Before the Subcommittee on Financial and Contracting Oversight  
Committee on Homeland Security and Governmental Affairs  
United States Senate**

**June 27, 2013**

Good morning, Madam Chairman, Ranking Member Johnson, and Members of the Subcommittee. Thank you for this opportunity to provide you an overview of the Department of Energy's Office of Environmental Management (EM) acquisitions and of contract and project management reforms that EM is implementing.

I am Jack Surash, Deputy Assistant Secretary for Acquisition and Project Management (APM) in the Office of Environmental Management (EM). I am a registered professional engineer and have been with the Department for seven years. Previously, I served as a U.S. Navy Civil Engineer Corps Officer for nearly 28 years and I achieved the rank of Captain before my retirement. The EM Office of Acquisition and Project Management was established in February 2012 to provide integrated acquisition and project management services for the EM program. My office is responsible for effective and efficient operation of the procurement functions within EM, including the management of the closeout of EM's program for the American Recovery and Reinvestment Act of 2009. My office also provides project management assistance, project oversight, and performance evaluation.

**Overview of the EM Mission**

The mission of the Office of Environmental Management (EM) is to complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research. One of the major focuses of the EM federal workforce is to carry out an effective and efficient process for acquiring construction, demolition, waste management, and environmental cleanup services and then manage the ensuing contracts and projects to ensure the scope of work is delivered to specifications within the negotiated costs and schedules.

EM continues to make significant progress each and every year. Although some of these projects have experienced challenges in the past, here are a few of the cleanup results we have achieved under our contracts during the last fiscal year:

- In Oak Ridge, Tennessee, demolition of 90 percent of the north wing of the radioactively contaminated K-25 facility was completed. That is part of is DOE's largest ever demolition project. K-25 was the world's first gaseous diffusion plant for uranium

enrichment, and it was the largest building in the world under one roof at the time it was built in 1943. The north wing alone was nearly as large as two football fields. Known today as the East Tennessee Technology Park, it is part of the largest environmental remediation project in Tennessee's history.

- At the Idaho National Laboratory in Idaho Falls, construction of the eighth buried waste retrieval facility was completed on schedule and under cost. Accelerated Retrieval Project VIII has been constructed over pits 1 and 2 at the Subsurface Disposal Area. With a total area of just under two acres, it is the largest facility of its kind that has been built on the site.
- The Savannah River Site in South Carolina has treated over 600,000 gallons of high level liquid waste, stabilizing the highly radioactive constituents of this waste in 275 vitrified glass canisters.
- At the Richland Operations Office in Washington State, EM has made major progress in the cleanout of one of the site's most complex and hazardous facilities, the Plutonium Finishing Plant. In October, EM removed a 10-ton, two-story contaminated glovebox from the plant. Over 75 percent of the facility's 232 gloveboxes have been removed, marking major progress on the path of demolishing the facility.

#### **EM Contracts**

I oversee execution of EM contracts in my role as the Head of Contracting Activity (HCA). As such, I am responsible for the effective and efficient operation of the procurement and assistance function within Environmental Management, and compliance with pertinent statutes, regulations, and Administration policies to achieve the mission, goals, and objectives of the Department. My staff and I assure effective project, acquisition, and contract management in the execution of the EM program, by working closely with senior level officials in Headquarters and Field Managers; external stakeholders; and major contractors to achieve acquisition and project management objectives of the Office of Environmental Management. We also provide current, innovative and standardized policy, training, tools, oversight, and guidance for project, acquisition, and contract management.

To assist the Subcommittee with their understanding of the current EM contracts portfolio, I think it is important to give a brief overview of the history of the contracts that have supported the program. EM in the 1990s was characterized by decentralized, individual site acquisitions. At that time, the portfolio consisted of approximately 12 Management & Operating (M&O) contracts that covered almost all the work performed at 12 separate sites. In contrast, the EM portfolio in 2013 uses a complex-wide, standardized acquisition process that includes over 35 major traditional cost-type contracts that replaced 10 of the M&O contracts in order to drive contractor performance. Two M&O contracts remain – at Savannah River, South Carolina and at Carlsbad, New Mexico.

EM transitioned from the historically large-site M&O contracts by unbundling them— i.e., using multiple smaller contracts to achieve program objectives. The contract type for the new, smaller contracts is based on a range of factors: the overall complexity of the work; extent of knowledge

of existing conditions, such as type and amount of waste; and amount of project risk that can be borne by the contractor. This strategy enables DOE to hire contractors that have specific expertise to perform discrete scopes of work. It also focuses the contractor effort on accomplishing the work scope by using clear metrics and incentivizing attainment of the end results within cost and schedule.

This strategy has been implemented with demonstrated success. At the Hanford Site in eastern Washington State, remediation of contamination along the Columbia River was procured separately as the River Corridor Project. Remediation along the 50-mile stretch of this major Pacific Northwest River was of particular importance to the local and regional stakeholders. At the Idaho National Laboratory, cleanup of the site was procured separately from laboratory operations to enable contractors with the relevant experience to carry out these two highly disparate requirements. At Savannah River, the scope to manage and treat the highly radioactive liquid waste stored in large underground tanks performed via a separate contract than the rest of site operations. At the Portsmouth Gaseous Diffusion Plant, a separate contract from the site infrastructure contract covers the work to decontaminate, demolish, and dispose of the extremely large buildings and vast amounts of equipment used to enrich uranium for nuclear weapons purposes.

#### **EM has Made Progress in Implementing Contract and Project Reforms**

EM's contract and project management has long been designated a "high risk area" by the Government Accountability Office (GAO). I am pleased to report that in the 2013 biennial update, the GAO narrowed the scope of its high risk designation, focusing on EM capital asset projects with costs greater than \$750 million. In that same report, GAO recognized EM management for demonstrating "strong commitment and top leadership support for improving contract and project management." A number of improvements have been made and we will continue to develop and apply further improvements in the future. As I have often stated-- acquisition and project management reform is a journey, not a destination. We are focused on sustained process improvements with the goal of improving results and protecting the taxpayer's interests.

Key reforms EM has instituted as part of our drive to continuously improve our processes include:

- Implementing policies requiring more front-end planning;
- Ensuring federal project directors and contracting officers have access to relevant training to help enhance their contract and project management knowledge;
- Improving cost estimating;
- Conducting more frequent project reviews by peers and experts in project management to ensure issues are identified early and lessons learned are being applied in real-time;
- Selecting proper contract types; tying fee strategies to final outcomes; and
- Restructuring our portfolio into smaller, better defined capital asset projects.

Additionally, we currently adhere to the following guidance for contracts for complex nuclear capital construction projects that was directed by the Deputy Secretary of Energy on December 13, 2012:

- *Improved Upfront Planning.* We assure proper upfront planning has been conducted so that requirements have been clearly identified and appropriate design maturity and technology readiness have been achieved and, depending on the complexity of the project, we now require 90 percent design completion prior to baseline approval. We ensure that safety is fully integrated into design early in the project; that contract requirements are clearly defined prior to issuing a solicitation for construction or major equipment purchases; and that a project is planned based on funding that is affordable and executable.
- *Contracting Strategy.* We first consider the use of a firm-fixed-price contract to complete work requirements in order to cap the government's cost liability. When a firm-fixed-price contract is not the appropriate contract vehicle, we incorporate contract clauses, such as liquidated damages (that provide an additional incentive for on-time delivery of products and services and make the Government whole for damages suffered as a consequence of non-performance), and ensure the contractor uses qualified and reliable sources for procurement of critical items. We structure contracts such that all or a significant portion of the fee for interim milestones will be provided provisionally and must be returned if the contractor does not fulfill its ultimate contractual obligations. In cases where it is appropriate, and when the total cost to perform can be estimated with reasonable certainty, we also use hard cost caps or a cost share approach to shift greater risk to the contractor.
- *Performance Measures.* We put in place objective performance measures to the maximum extent possible to incentivize optimal contractor performance and reduce costs. We have also enhanced our performance reporting system to make actionable performance data available to each Acquisition Executive to maintain real-time situational awareness of costs, performance, and other important metrics so they can proactively engage and mitigate potential issues. We are also ensuring that contractor performance continues to be reported into the Government's contractor past performance database that is available for use in evaluating future contract awards. Finally, we have enhanced the federal oversight of contracts to ensure products are delivered as specified on time and within budget.
- *Project Peer Reviews.* We have expanded the use of project peer reviews following a process similar to DOE's Office of Science. We also have partnered with US Army Corps of Engineers to obtain cost estimating services as well as resources for project peer reviews.

#### **EM Contract Reforms have Driven Some Notable Project Successes**

The following examples are noteworthy of how EM contract reform initiatives led to results that were above our expectations: (1) Rocky Flats Closure Project, (2) Fernald Closure Project, (3) Idaho Nuclear Facility Decontamination and Decommissioning Project and (4) Recovery Act projects. In all these examples, the work was completed ahead of the target schedules and below the target costs.

Key success factors associated with these contracts were: the relatively short cleanup timeframe (e.g., less than 10 years); the pre-determined end-state and land use; identified off-site storage

and disposal locations for special nuclear materials and radioactive waste, respectively; agreements with the regulators and communities about the allowable amount of residual contamination remaining on site; the use of earned value measures on the cleanup baseline to measure progress in lieu of numerous regulatory milestones; and predictable funding appropriated by Congress.

Rocky Flats Closure Project, located northwest of Denver, Colorado, was completed in October 2005. The Project entailed closure and cleanup of the 6,245-acre site, including the 385-acre industrial area. Over 800 buildings were demolished and 100 metric tons of plutonium residues were processed and shipped. The radioactive waste shipped for disposal from the site was enough to fill a string of railcars 100 miles long. Today, DOE's Office of Legacy Management manages a 1,300-acre area encompassing the former industrial area, and the remaining 4,900 acres is managed by the U.S. Fish & Wildlife Service as the Rocky Flats National Wildlife Refuge. The project was originally estimated at a cost of \$3.96 billion to be completed in six years. The project was completed a year early and the actual cost came in \$550 million below that amount and in 2006 was the first government (non-commercial) project to receive the Project Management Institute's (PMI) Project of the Year award.

Fernald, Ohio's massive cleanup included remediation and removal of radioactive wastes from two concrete silos (8,900 cubic yards); another silo (5,100 cubic yards cold metal oxides; six waste pits (over 1 million tons); six million cubic feet low-level wastes; 174,912 gallons low-level liquid mixed waste; and 31 million pounds of nuclear product. Additionally, 224 buildings, 400 acres soil, and a 225-acre groundwater plume contaminated with radioactivity were remediated. Today, DOE's Office of Legacy Management manages the Fernald Preserve, a 1,050-acre undeveloped park, with a growing diversity of native plants, birds, deer, and small animals. The project was completed in October 2006 at a cost of \$4.4 billion, 12 years early and \$7.8 billion below initial estimates. In 2007, the project received PMI's Project of the Year award.

The Idaho Nuclear Facility Decontamination and Decommissioning Project, completed in September 2012, entailed the deactivation, decontamination, and decommissioning of surplus nuclear, radiological, and industrial facilities at the Idaho National Laboratory (INL). The project eliminated the risk posed by 171 unneeded surplus facilities, and eliminated the expense of maintaining a facility with a footprint of over 1.63 million square feet. The project was completed on time and \$440 million below the \$796 million project baseline.

EM has demonstrated success in accelerating the environmental cleanup of contaminated facilities and lands across its complex utilizing the \$6 billion received in American Recovery and Reinvestment Act (ARRA) funds. More than 133 specific cleanup projects/activities were initiated at 17 sites across 12 states. In part due to the Recovery Act investments made since 2009, the EM has reduced its cleanup operations footprint by 74 percent, surpassing the original goal of a 40 percent footprint.

EM learned a number of key lessons from these contracts. Contract types were traditional cost plus incentive fee and were specific about cleanup goal, the completion date and the amount of funding DOE would provide. DOE aligned the contractor's profits with the speed and cost of contract completion. Other elements of EM's contracting approach included focusing on a few critical outcome measures and setting high change control thresholds. A paradigm shift for DOE

to “Manage the Contract, not the Contractor” incentivized the contractor and allowed the contractor maximum flexibility to complete the project in the safest and most cost-effective manner.

#### **EM Continues To Reform Contract Management and Implement Lessons Learned**

Although EM had successes over the years, two projects—the Waste Treatment Plant (WTP) at Hanford Washington and the Salt Waste Processing Facility (SWPF) at Savannah River, South Carolina—have proved especially challenging. Applying the lessons learned over the last decade, EM would have taken a different approach to these projects.

While we cannot go back in time to start over, and those projects have clearly not lived up to our expectations, we have ensured the lessons from our new initiatives are being applied to these projects as we have made modifications to the contracts. Areas we are currently focused on for those projects include: resolving technical issues that have impacted the progress on the WTP, contract negotiations consistent with the Deputy Secretary’s guidance on contractor’s accountability for their actions, and establishing new revised baselines for both projects.

These projects and the rest of EM’s contract and project portfolios have benefited from targeting the contract/project change process as an area of high priority within EM. In addition, I have partnered with DOE’s Office of Acquisition and Project Management to provide training on improving the contract change process on our EM contracts to our Federal staff.

EM has implemented a standardized acquisition planning process to enable future cleanup acquisitions and contract transitions to proceed more quickly and efficiently. We have co-located many of the resources we use to support our most complex acquisitions at the EM Consolidated Business Center (EMCBC) in Cincinnati, Ohio. It provides business services to certain EM sites that, because of their small size, did not have specialized expertise for such functions as procurement, contract management, finance, and legal services.

I host weekly reviews to discuss the status of major acquisitions planned for the next two years and the status of options on key contracts. We have an EM HCA Directive that helps us maintain oversight over contractor business systems. My staff and I monitor Fee Determination processes and past performance ratings and ensure that Earned Value Management Systems (EVMS) and insight into cost schedule and performance are emphasized throughout contract execution by both contracts and projects professionals.

Contract and project management staff are key partners in assuring that EM performs its cleanup mission and executes contracts to achieve our goals as effectively and efficiently as possible. Teamwork and coordination is essential among program and contracting communities throughout the contracting process, and I personally monitor new contracts and changes to existing contracts through a business clearance process that requires our site offices to obtain HCA approval of prenegotiation positions over \$25 Million.

This is part of a conscious campaign to maintain discipline throughout the Contract Changes and Equitable Adjustments processes. This is done with an eye toward increasing vigilance against cost growth and it helps improve schedule performance. It also helps ensure that upper

management actively oversees key contracts at our sites. The Deputy Secretary has issued direction to all DOE activities. I have reinforced that direction through various HCA Directives. This direction requires briefings/reviews before key contract and project events such as:

- Contract Award
- Option Exercise
- Fee Determinations
- Past Performance Evaluations
- Approval to move to next phase of Design/Construction

To hold EM managers accountable for acquisition results, EM uses an Annual Performance Agreement. The agreement is signed by Senior Advisor for Environmental Management (EM-1) and all his direct reports. The agreement includes EM goals, strategies and annual metrics that flow into each manager's performance plan. The goal of improving project and contract management with the objective of delivering results on time and within cost has six strategies and ten performance metrics that identify our highest priority improvement areas to address deficiencies that GAO and our own planning has identified, which include: assessment of staffing and skill level, independent validation of effectiveness and sustainability of implementing corrective measures, timeliness of change control, meeting small business goals and being a strong owner. The strategies and metrics provide the roadmap and are a means to measure progress and I personally review progress on the metrics on a monthly basis.

#### **Conclusion**

I am honored to be here today representing the Office of Environmental Management, and EM is committed to achieving our mission. We will continue to apply innovative acquisition strategies to complete work safely, on schedule, and within cost thereby demonstrating value to the American taxpayers. We continue to collect lessons learned and make improvements and adjustments along the way to ensure mission success and protection of the interests of the Federal government and U.S. taxpayer. Thank you for inviting me to speak with you today. I am pleased to answer any questions you may have.

**Statement of Michael Graham  
Principal Vice President, Bechtel National, Inc.  
Before the Subcommittee on Financial and Contracting Oversight  
U.S. Senate  
June 27, 2013**

Madam Chairwoman, Senator Johnson, and members of the subcommittee, I am Michael Graham, Principal Vice President of Bechtel National, Inc., a contractor to the U.S. Department of Energy for Environmental Management work, and the lead contractor for the Hanford Waste Treatment and Immobilization Plant (WTP) project.

Bechtel is a global engineering and construction company with more than 115-years in the business. Our company has a long history of working in the private sector, but we've also worked on some very large government projects including the Hoover Dam, building Liberty Ships during WW II, and now the Washington Metro Silver Line. We have successfully designed, managed, or constructed hundreds of large-scale projects around the world including putting out the oil fires in Kuwait, constructing major motorways and high-speed rail lines in Asia and Europe (including the Chunnel), and designing and building nuclear power plants in the United States. Some of our largest endeavors have been design-build projects.

Bechtel National began operating in 1977, and among its first contracts were response efforts at Three Mile Island in 1979, and the 1981 contract with the U.S. Department of Energy (DOE) to manage the Formerly Utilized Sites Remedial Action Program, a multi-year, \$2.5 billion environmental cleanup program for early U.S. atomic energy program sites.

To be sure, DOE projects are often complex and challenging. They are often one-of-a-kind endeavors. But they also present an opportunity to solve some of our country's greatest problems, many that owe their legacy to the Manhattan Project.

We are proud of our accomplishments for DOE. I have personally worked at four of the major DOE sites: Hanford, Idaho, Savannah River, and Los Alamos. For example, I led the Hanford Groundwater-Vadose Zone Integration Project to evaluate the impacts of Hanford waste on groundwater and the Columbia River.

The DOE contractor community involved in these projects works as a team to support the mission. Granted, we often compete on new procurements, bringing our best ideas and talent to the job. To date, DOE's Environmental Management program reports that it has completed cleanup of 90 of their 107 waste sites, a testament to strong industry support that works together and in partnership with DOE to solve challenging problems. Yes, we have successfully completed tough projects, but the very toughest are now upon us.

The largest and most complex DOE project is the Waste Treatment Plant in Hanford, Washington. This one-of-a-kind project includes a complex of facilities being designed and built to immobilize the highly radioactive waste stored in 177 aging underground tanks. Some of the tanks date back to World War II and 67 have been reported to have leaked. WTP will immobilize the waste using a process known as vitrification, which

mixes the solid and liquid waste with molten glass to safely isolate the waste from the environment.

In December 2000, when we entered into the contract to design and build the Hanford Waste Treatment Plant, we knew this job—which is the size of at least two commercial nuclear power plants—would be a challenge. Working closely with DOE, we have managed the challenges of new technology, uncertain waste streams from the tanks, evolving requirements, and the need to sustain a complex supply chain during periods of funding uncertainties.

The Waste Treatment Plant project today is a very different project than what we signed up for in 2000. Back then, DOE described it as a “pilot project” and one that was much smaller in scale and capability. DOE directed it be a fast-track design-build effort to address the risk of high-level waste leaking into the groundwater from the aging tanks. Glass was scheduled to be produced by 2007, with 10% of the waste being treated by 2018. A multi-billion dollar Phase II facility would be built later.

Since then, plant capacity has been significantly increased to enable DOE to eliminate the second phase. The Pretreatment capacity was increased by 40 percent and the High-Level Waste facility glass production was increased by a factor of four (4). These changes required a separate facility for laboratory work, and we recently met the “construction substantially complete” interim milestone for that facility.

These and other increases in scope were substantial factors addressed in the revised project baseline in 2006.

We are very proud of Bechtel's performance on this design-build contract overall, but like any large project we have learned many lessons along the way. Our conservative design-build approach approved by the DOE has significant built-in margin. For example, implementing revised seismic criteria in 2006 did not require any major construction rework.

Nevertheless, Bechtel, with DOE, has taken several steps to improve the design-build concept and execution. After the project was rebaselined in 2006, we deployed an earned value management system to track and manage our progress. This system has been certified and revalidated by DOE as recently as 2012. Utilizing this system, the WTP project performed to the baseline until 2011 when DOE requested that decisions regarding the waste stream and processing requirements be revisited.

Today the project is progressing more slowly than we would like. The Waste Treatment Plant design is now largely done and construction is more than 65 percent complete. Last year Secretary Chu put some parts of the project on "pause" while he assembled a team to take another look at a number of critical technical decisions. Many of these decisions are related to what would happen if the WTP receives waste outside of its waste acceptance criteria. As we have discussed with DOE, resolution of these decisions to everyone's satisfaction could have significant impacts on costs and schedule. We are confident we

can complete the job and put WTP into operation, as we work our way through these decisions.

We and the other contractors involved in this critical national mission remain fully committed to complete this project. The WTP is currently designed to safely treat most of the tank waste. We must get on with it. As you know the situation with the tanks continues to deteriorate. That is the real risk.

Thank you for the opportunity to make these remarks.

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**STATEMENT BY**

Mr. Michael McKelvy  
President and Division Chief Executive  
CH2M HILL Constructors, Inc.  
Government, Environment, and Infrastructure Division

**BEFORE THE**

Homeland Security and Governmental Affairs Committee  
Subcommittee on Financial and Contracting Oversight  
United States Senate

27 June 2013

**CH2MHILL.**

Good morning Chairman McCaskill, Ranking Member Johnson, and members of the Subcommittee. Thank you for your invitation to appear here today to discuss contract management by the Department of Energy's Office of Environmental Management. My name is Mike McKelvy and I am the President and Division Chief Executive of the Government, Environment, and Infrastructure (GEI) Division of CH2M HILL. The GEI Division represents the vast majority of our federal government work as we provide many diverse support services to the U.S. Government. With relation to the hearing topics, it is also important to note that I am the Chairman of the Board for the Idaho Cleanup Project (ICP) and the CH2M HILL Hanford Plateau Remediation Company (PRC) Board of Directors. It is my pleasure to address the management of CH2M HILL's DOE-EM contracts today.

CH2M HILL is an employee-owned global consulting, design, design-build, program management, and operations and maintenance firm founded in 1946 and headquartered in Englewood, Colorado. Annually, CH2M HILL earns \$7 billion in revenue of which 28 percent is work for the US Federal Government. Year in and year out, CH2M HILL has been recognized as an industry leader in design, construction management, and program management as judged by *Engineering News Record*. CH2M HILL was the first firm in the heavily male-dominated engineering and construction industry to receive the prestigious *Catalyst Award* for our commitment to recruit, develop, and advance women in the workplace. We have also been named a leader in sustainable engineering and environmental services providers by *Verdantix*. Finally, and most important to me, CH2M HILL was judged for the fifth year in a row as one of the world's most Ethical Companies by the *Ethisphere Institute*; the only US firm selected from the construction industry.

Our success as a contractor can be attributed to our safety focus, our exceptional people and continually refined project delivery processes. Safety is always the first and foremost consideration for any CH2M HILL project or endeavor. Safety is made more challenging at nuclear cleanup sites because of the unique nature of the work, highly contaminated facilities, and in some cases dangerous levels of radioactivity – adding layers of protection to keep the workers, the public and the environment safe. As an employee-owned company with an ethical foundation that focuses on the integrity of our character and a defined set of values that originated with the company founders, we expect our people to make the right choices daily in support of the Government client and the American taxpayer.

In the invitation letter, you outline several areas for today's discussion and I will do my best to address those areas. The first being the **Management of Environmental Remediation Contracts for DOE-EM:**

CH2M HILL has a successful record of performance managing and operating nuclear facilities and providing innovative cleanup and environmental remediation for DOE projects and sites since 1994. CH2M HILL has been responsible for the successful delivery of two of DOE's three largest closure projects – the Miamisburg and Rocky Flats Closure Projects. I would like to point out that the work to remediate former nuclear weapons sites is extremely difficult, with a variety of environmental, safety and health risks and hazards. Today, cleaning up the environmental legacy from nearly six decades of nuclear weapons development and nuclear energy research is made more challenging because we are dealing with dangerous, highly radioactive materials and wastes.

Not unlike some of the work we do for other federal agencies, we typically set up joint ventures or special purpose entities to perform the work with other large contractors providing diversity in corporate skills sets and value to the DOE in the form of greater corporate reach back for project support on DOE-EM projects. Special purpose entities are often backed by significant performance guarantees to DOE from our parent companies to ensure to the government that CH2M HILL stands behind its work. We also establish a Board of Directors on each special purpose entity to ensure consistency in management practices. The Boards offer leadership, guidance, and corporate reach back and support on the corporate level to the president of each site to ensure best practices are being utilized.

#### **Decontamination and Decommissioning at Hanford**

CH2M HILL's work at the Hanford site dates back to the early 1970's when the firm won several task orders from the Atomic Energy Commission-Hanford Works Project. Over the last two decades, CH2M HILL has had several large contracts at the Hanford site including: the **Hanford Tank Farms Contract** from 1999 to 2008, and the **Hanford Central Plateau Remediation Contract** from 2008 through 2018.

DOE's use of a Cost-Plus-Award-Fee contract on the Hanford PRC project has allowed DOE to specify the objectives and standards to be met, make adjustments for changes in funding work priorities, and provided us the flexibility as to how best to accomplish the decontamination and

decommissioning work. This has enabled DOE to clearly measure performance and hold us accountable for both interim and long term results. The DOE uses a Performance Evaluation and Measurement Plan, which details the administration of performance incentives and allocation of Total Available Fee. Each performance measure sets forth the specific requirements, criteria and specifications for acceptable performance of an outcome and the amount of fee assigned to the individual performance measure. Each performance measure also has a distinct fee structure to incentivize maximum performance and resource utilization.

#### **Integrated Waste Treatment Unit at the Idaho Cleanup Project**

On the Idaho Cleanup Project (ICP), CH2M HILL is currently managing the safe decommissioning and environmental cleanup of the Idaho National Laboratory (INL) in eastern Idaho. To achieve the cleanup goals as part of the Cost-Plus-Incentive-Fee ICP contract, our scope includes the treatment of 900,000 gallons of highly radioactive sodium-bearing waste currently stored in underground tanks generated from decades of spent nuclear fuel reprocessing and decommissioning and decontamination activities. As part of our contract, we have designed and constructed a first-of-a-kind facility – the Integrated Waste Treatment Unit (IWTU) – to treat and prepare the liquid radioactive waste for permanent disposal.

Early on, several issues hindered progress during the design-build phase that increased the complexity of construction resulting in the push back in start-up of the facility several times. The most significant issue with the design was the way in which seismic analysis had been conducted for the structural design. This issue resulted in the DOE decision at the urging of the DNFSB to upgrade the hazards (and therefore seismic) classification of the facility, after the preliminary design had been completed. Another design change directed the conversion of the facility from sodium-bearing waste treatment to treat calcine (another form of radioactive waste stored at INL) for future missions. Incorporation of the more conservative safety recommendations also impacted the civil works on the core of the plant which were already underway. Lastly, in 2008, a further one-year delay in the project completion was the direct result of fiscal year funding limitations.

The IWTU facility was originally estimated \$379 million; however, due to directed design and operational changes, we provided the government with a revised estimate of \$600 million to complete the project. The contract was adjusted in 2010 and subsequently a cost-cap of \$533 million was established for the IWTU project, less than the validated estimate, at which point we

would pay for any additional costs. In addition schedule incentives and penalties were established for the project completion date. On April 2012, construction was completed at a final cost of \$621 million, with the parent companies of the joint venture performing the ICP contributing more than \$88 million of company funds to complete the construction. In addition, the company earned no fee and incurred schedule penalties for not having the facility on line by the end of the contract period.

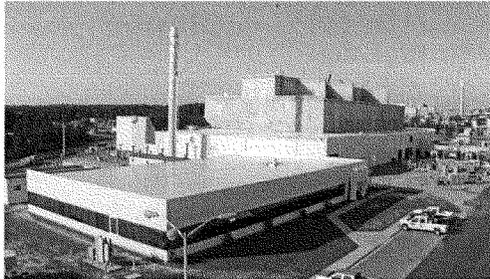
I am extremely proud of the Idaho Cleanup Project's workforce and the great work accomplished over the years. Despite the IWTU issues, the ICP contract was delivered \$520 million below cost, and to the satisfaction of the State of Idaho. Our employees accepted great challenges and were empowered to come up with innovative solutions, resulting in efficiencies and unprecedented success with a stellar record of safety. Largely attributable to this success is the great partnership we share with our client, DOE.

The safety of our workers, the public and the environment is our foremost priority on the challenging and dangerous work across all of our DOE-EM contracts. Success in progressing the DOE-EM mission has been possible because of the cooperative agreements between three principle parties – Congress, DOE and the contractor. I would like to thank the Subcommittee for their time today. With that, Madam Chairman, I would be pleased to answer any questions the Subcommittee may have.

**Written Testimony of Frank Sheppard  
Parsons Salt Waste Processing Facility Deputy Project Manager  
Before the  
Subcommittee on Financial and Contracting Oversight  
United States Senate Homeland Security and Governmental Affairs Committee  
June 27, 2013**

**INTRODUCTION**

Chairman McCaskill, Senator Johnson, and distinguished members of the Subcommittee, thank you for having me here today to discuss the subject of contract management by the Department of Energy (DOE). My name is Frank Sheppard. I represent Parsons and the Salt Waste Processing Facility (SWPF) currently being constructed at the Savannah River Site (SRS) near Aiken, SC. I am the Deputy Project Manager for SWPF and have been with Parsons since September of 2011.



SWPF is a large, complex, first-of-a-kind radioactive waste treatment facility. The mission of SWPF is to safely and efficiently segregate radioactive salt waste from the two tank farms into products suitable for processing at the Defense Waste Processing Facility and the Saltstone Processing Facility, both of which are currently in operation. The SWPF facility is the last component needed in the Liquid Waste System at the site and is on the critical path for completion of DOE's cleanup at SRS.

When operational, this facility will help eliminate the risk to the public and the environment by removing approximately 200 million curies<sup>1</sup> from 47 tanks and processing 100 million gallons of

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<sup>1</sup> A unit of radioactivity, equal to the amount of a radioactive isotope that decays at the rate of  $3.7 \times 10^{10}$  disintegrations per second. (Named after Marie and Pierre Curie)

radioactive waste. To convey how significant the facility design and construction is, let me briefly describe the size and quantity of materials involved:

- 145,000 square feet facility,
- ~40,000 cubic yards of concrete,
- ~8,000 tons of structural rebar and steel,
- ~130 miles of wire and cable,
- ~27 miles of piping, and
- ~3,700 valves.

The construction of the facility is currently over 72% complete and we recently finished enclosing the facility with completion of the roof in February 2013, just one week past our contractual target schedule milestone date.

#### **DESIGN AND CONSTRUCTION**

In December 2000, then SRS Management and Operating (M&O) contractor, Westinghouse, estimated SWPF to cost between \$3.4-3.6B. In 2001, the DOE issued a Critical Decision-0 (CD-0) cost range of \$673M to \$2.6B. The SWPF contract was awarded to Parsons in 2002. Although there have been cost increases on this first-of-a-kind project for a number of reasons (including significant material upgrades to seismic and quality assurance requirements), the current Parsons contract value is \$1.74B, which is slightly above the median cost of the 2001 original CD-0 cost estimate range.

The Parsons contract encompasses design, construction, testing and commissioning of the facility, one year of operations and then 6 months of support if the operations are transferred or competed to another contractor. Our focus throughout the project has been on safety, quality, schedule, and cost. Parsons safety performance on SWPF is good and is improving. The construction recordable injury rates are roughly half the industry average. More importantly, the severity of the injuries is decreasing as reflected in worker's compensation costs.

Parsons believes that investing to continually improve safety is a core value and a fundamental principle of our business. Parsons takes on this task without a defined return on investment. From a contractual standpoint, Parsons receives no monetary incentive from DOE to improve safety.

SWPF is unique for DOE or National Nuclear Security Administration (NNSA) first-of-a-kind construction projects in that we have no major outstanding technical or regulatory issues in the design or construction of the facility. We are very proud of the fact that we have been able to consistently undergo reviews by DOE and others with no significant technical or design issues being identified. Additionally, the contract requires a throughput of approximately 6 million gallons per year and we are confident our design will result in the facility processing between 8 and 9 million gallons per year. Parsons has tested a Next Generation Solvent (NGS) with very positive results. We have proposed implementation of NGS to DOE. If implemented, we believe the facility has the potential to process 12 million gallons per year or possibly even more. This implementation could dramatically reduce the operational life of the facility, save significant life cycle costs for the Department and accelerate major risk reduction at SRS.

Unfortunately, additional requirements and more stringent standards, imposed after the initial contract award, have led to cost increases and schedule delays associated with the SWPF project.

- Change in Throughput Capacity. At CD-1 (November 2003), the contract required a throughput of only 3 million gallons per year. Subsequent to that, in a CD-1 Addendum (August 2004), DOE directed the capacity be increased to 6 million gallons per year. In addition, requirements for utilities, the waste transfer line, the Alpha Finishing Facility and a laboratory were added to the work scope.
- Change in Natural Phenomena Hazard (NPH) Category. At CD-1, the contract required a Performance Category 2 (PC-2) facility design. In January 2006, contract modification M026 directed Parsons to stop work on the PC-2 final design and immediately begin preparation of an Enhanced Preliminary Design in which the Central Processing Area and structures are designed to meet more stringent PC-3 requirements.
- Change in Quality Standard. At CD-1, the contract required compliance with International Organization for Standardization (ISO) 9001. Subsequently, in June 2009, contract modification M065 required the inclusion of Nuclear Quality Assurance (NQA) NQA-1-2004 as the primary quality standard. The ASME NQA-1 standard is more rigorous, and therefore, more costly to implement than the less stringent ISO 9001 program. ASME NQA-1 is a quality management system that is applied across the entire Project, including subcontractors and suppliers, on a graded approach. The overhead associated with establishing and maintaining an ASME NQA-1 compliant nuclear Quality Assurance (QA) program carries significant cost implications ranging

from internal staffing and training to higher costs from suppliers with ASME NQA-1 programs. For example, the cost of a piece of equipment can be five to ten times higher than an identical piece of equipment manufactured to a less rigorous standard. The cost of the qualification documentation the supplier must provide with the "certificate of conformance" is substantial. This same QA program implementation cost burden is realized again on the construction site through extensive documentation, inspections, layers of oversight, and testing. The competition and retention of the required personnel with the proper education, experience, qualifications, and certifications is also key factor in the cost of implementing an ASME NQA-1 program. The standard requires use of experienced/certified inspection and nondestructive testing personnel, qualified welders, designers, engineers, and quality assurance personnel to name a few.

- **Nuclear Supply Chain Atrophy.** The diminished ability of most nuclear qualified vendors and suppliers to effectively meet NQA-1-2004 standards on a consistent basis has caused significant cost growth and schedule delays on SWPF as well as many other DOE/NNSA nuclear facility construction projects. The most significant delay on the SWPF project was related to the manufacturing and delivery of our 10 large American Society of Mechanical Engineers (ASME) processing vessels. After initially awarding one subcontract, it became apparent the vendor could not provide the quality necessary for the large vessels. That contract was terminated and a subsequent subcontract was competed. Although the subcontractor was incentivized to deliver the vessels in July 2011, the 10 large ASME vessels were finally delivered to SWPF in June and July 2012. This is not an isolated issue affecting just nuclear vessel manufacturers. The limited number of qualified vendors and suppliers available for this specialized project persists with respect to items, such as pipes, bulk material and valves.

Throughout the contractually directed changes and management of the supply chain, Parsons has consistently worked to mitigate any schedule and cost impacts while maintaining the high degree of safety and quality necessary on a DOE project. Given the extensive delay in delivery of the large vessels, Parsons effectively built the facility around the area of the vessels and then safely placed the vessels into the facility. This approach required significant innovation and changes in the construction approach to mitigate even more schedule delays and cost impacts.

We recently signed contract modification 116 with DOE on June 17<sup>th</sup> that includes all of the additional costs associated with the challenges and impacts I spoke to earlier. This modification establishes a cost

cap-type contract for the completion of construction by December 2016. Parsons has assumed significant liability with this type of contract and cost cap, but we are committed to deliver construction complete on or ahead of schedule and at or below the target cost.

#### **DOE PROCESS TO EVALUATE PERFORMANCE**

The Department of Energy uses an evaluation system called the Contractor Performance Assessment Reporting System (CPARS). The system is a standard system that allows for the evaluation of contractors based on five Performance Elements and 32 sub-elements. The five ratings are *Outstanding*, *Above Average*, *Satisfactory*, *Marginal*, and *Unsatisfactory*. Based on our records, DOE has completed only two CPARS evaluations on the SWPF contract.

The first CPARS evaluation was completed in September 2010, with construction 25% complete. Parsons received an overall rating of *Satisfactory*, with all of the sub-elements rated at either *Above Average* or *Satisfactory*.

The second CPARS evaluation was conducted in January 2013, with construction 60% complete. Parsons received an overall rating of *Marginal*, although we received 7 *Outstanding*, 7 *Above Average*, 7 *Satisfactory*, 7 *Marginal* and 2 *Unsatisfactory* sub-element ratings (2 were not applicable).

The DOE stated in the evaluation remarks that due to the impact of the cost overrun and schedule delays caused by late delivery of the ASME vessels, these elements were weighted more heavily in the overall rating. Parsons appealed and provided documented evidence (attached) to DOE in response to each of the objectionable ratings, specifically that we were maintaining overall schedule objectives, but the overall rating of *Marginal* was upheld by DOE in the final determination.

#### **USE OF DESIGN-BUILD MODEL AT SWPF**

It is our opinion that although there have been cost increases on this particular project, the design-build contract model has worked successfully to date for SWPF. Due to the nature of our design for SWPF, using extensive sloped piping systems and designed to operate at essentially ambient temperature and pressure, it is crucial to maintain the technical and engineering expertise from design throughout construction and into the commissioning and operations phases. This is critical to maintain the pedigree of technical documentation required by NQA-1 and required to successfully complete the DOE Operational Readiness Review.

**CONCLUSION**

As I stated earlier, we have no outstanding technical or regulatory issues to resolve at SWPF. Parsons and DOE have agreed to a path forward to complete construction no later than December 2016. We are working with DOE to negotiate the path forward for the remainder of the Commissioning, One Year of Operations and 6-months support (if necessary). We will continue to propose new and innovative concepts to DOE that can potentially reduce overall life cycle costs. We are confident we will deliver a facility that will successfully complete start-up, will operate in a safe environment for the workers, will outperform the contractual capacity requirements, and will provide significant risk reduction for the Savannah River Site.

Thank you for the opportunity to speak with you today. I am happy to answer any questions you may have.

**Submission for the Record**

Bechtel National, Inc. (BNI) would like to provide the following clarification regarding the payment of a \$15 million completion milestone fee for the Submerged Bed Scrubber vessel (i.e., SBS vessel) that was the subject of a Department of Energy Inspector General report in April 2012 (DOE/IG-0863), a GAO report in December 2012 (GAO-13-38), and discussed during the hearing on June 27, 2013.

This fee milestone was initially declared complete by BNI on November 12, 2003 and the fee paid by the DOE. On February 11, 2004 DOE issued a letter to BNI alleging that certain quality requirements (volumetric inspection) had not been performed on the vessel and requesting that the fee be repaid.

In early 2004, BNI agreed to conduct further actions to bring the SBS vessel into full compliance and BNI agreed to not invoice for the quarterly provisional fee payments until the actions were completed. DOE agreed to not offset or reduce invoice payments for the SBS vessel fee repayment.

In May 2004, BNI informed DOE that all of the actions associated with bringing the SBS vessel into full compliance had been completed. The notice also stated that pending verification, BNI would resume submittal of provisional fee invoices.

In January 2009, DOE executed a change to the WTP contract (Modification A143) that restructured the contract, revised the total price, schedule and statement of work, and replaced the fee structure. In this contract modification, DOE made a final determination specifying that all fee previously paid for schedule milestones and all previously paid provisional fee was considered earned, thus reaching settlement and closure for any and all prior fee-related matters. This modification constituted final settlement of the SBS vessel milestone fee.

DOE's response to a GAO recommendation on this matter in the April 2012 report (which is reprinted in that report), indicates that DOE considers the issue closed:

*"In response to an earlier Inspector General report, ORP (DOE Office of River Protection) investigated whether there were irregularities regarding payment of a fee to the WTP contractor for a milestone for which quality assurance issues were identified. ORP noted that with regard to previous payments of fee, a modification of the contract was issued in January 2009. That contract modification essentially determined that the final fee determinations for work performed prior to that modification totaled a specific dollar value. ORP noted that the final fee determinations consisted of previously paid fee for schedule milestones, and previously paid provisional fee, which was deemed earned at the time, and was not subject to further clawback."*

**Post-Hearing Questions for the Record  
Submitted to the Honorable Gregory H. Friedman  
From Senator Claire McCaskill**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. The Department of Energy is the largest civilian contracting agency, spending nearly 90% of its budget on contracts. Unfortunately, contract management seems to be the Department’s biggest weakness. The Department of Energy has been on GAO’s high risk list for its contract management for over 20 years.

Q: What areas of contract management has your work identified as being particularly challenging for the Department?

For over 10 years, the Office of Inspector General has reported contract management as one of the Department’s critical Management Challenges. Although not exclusively, our concerns have centered on developing cost estimates, defining project scopes, and managing contract change proposals and schedule changes. Examples can be found in many of our reports, including:

- The Department of Energy’s K-25 Building Decontamination and Decommissioning Project (DOE/IG-0854);
- The Management of the Plateau Remediation Contract (OAS-L-13-03); and,
- Processing of Sodium-Bearing Waste at the Idaho National Laboratory (OAS-L-10-03).

2. The Department of Energy has repeatedly failed to accurately estimate the costs of its major projects.

Q: What does Environmental Management’s (EM’s) February 2013 cost estimate guidance require?

We have not specifically evaluated this guidance.

Q: Has it been used on any major acquisitions yet?

As with the previous question, we have not specifically evaluated this matter.

Q: Are there any independent offices within the Department that consistently review cost estimates?

Based on our previous work, we know that as part of its mission the Department’s Office of Acquisition and Project Management reviews and validates the project performance baselines, to include cost and schedule, of all large construction and environment clean-up

projects prior to the Department's Budget Request to Congress. Prior to reorganization, this work was conducted by the Department's Office of Engineering and Construction Management.

Q: It appears that the Department's cost estimate policy applies only to capital asset acquisition projects and that EM has begun re-classifying many of its projects as non-capital asset acquisitions. Is this a correct characterization, and doesn't this lead to contract cost estimates receiving even less scrutiny?

We are not aware that EM has modified its policy with regard to re-classifying projects as non-capital assets acquisition. Such a change could have a significant impact on cost estimating in the future. Given our historical concern with EM's cost estimating processes, this is an area we will consider for evaluation going forward.

3. Most environmental remediation is concentrated among a few large contractors, who frequently form joint ventures with each other. These contractors refer to themselves as "competimates", meaning that they may be competitors for one project, but joint venture teammates on another. While the Department has stated that it is fortunate to have well-qualified contractors capable of doing the technically complex tasks it demands, contractors outside this circle have complained that the Department is not open to working with new contractors.

Q: Why does the Department rely on such a relatively small number of large contractors for its major projects?

Based on our general knowledge, we know that many if not most EM contracts are openly competed and that the competition between proposals is frequently intense. However, from our experience, as your question implies, the number of competing proposals is often quite limited. We have been told that there are a limited number of contractors and/or contractor teams with the specialized expertise to complete the required work.

4. Contractors working at highly contaminated sites often experience unforeseen problems. Many contractors signed contracts that described one set of conditions at the site, only to find completely different challenges once they begin work.

Q: How often do contractors meet requirements for submitting timely and documented contract change proposals?

While we cannot provide analytically-based data on frequency, we have reported that EM contractors have often failed to submit contract change proposals which are timely and well documented – specifically, laying out the rationale for the change and a reliable cost estimate. As noted in the testimony, we know this is a core management problem with significant consequences. For example, as described in our audit report *The Management of Plateau Remediation Contract* (OAS-L-13-03), we found that CH2M Hill Plateau Remediation Company had not always met contract and FAR requirements for submitting timely and/or well supported contract change proposal.

Some contractors have stated that documentation cannot be provided because of the uncertainty of the cost of work in the outer years of a contract.

Q: Is this a valid justification?

We have seen some cases where the project's scope of work is difficult to anticipate due to the complexity and scale of the project. Anticipating the scope of work, or impediments to being able to do so in the context of multi-billion dollar EM projects, is of concern. We recognize that in some of these instances, neither the Department nor the contractors can accurately predict the full scope of work needed. Therefore, the complete cost of work in the outer years of these projects could be very difficult to estimate. However, we do not believe that this should be accepted as a blanket excuse for poor contract cost estimates and less-than-robust government validation.

5. One reason that DOE's cost estimates are so poor is because EM has initiated construction of facilities before completing their design, also known as the "design-build" model.

Q: Besides legacy projects, has the Department discontinued the "design-build" practice?

As your question suggests, design-build has been a problem which has been widely recognized. To a large extent, it was adopted in the hope of meeting stringent deadlines, which are mandated by legally binding environmental remediation consent agreements. We are not aware of EM's current posture with regard to design-build.

Q: How frequently have you encountered instances in which EM contracts for major projects without first conducting small scale demonstrations or pilot projects?

We have encountered a number of examples of instances in which EM contracts for major projects without first conducting small scale demonstration or pilot projects. For example, in our audit report *The Department of Energy's K Basins Sludge Treatment Project at the Hanford Site* (DOE/IG-0848), we reported that the Department allowed its contractor to design and fabricate a sludge treatment and packaging system without first verifying on a small scale the adequacy of the equipment's performance for the intended application. Ultimately, the system was deemed ineffective and was abandoned by the Department. As a result, the Department spent \$43 million and invested 3 years of effort without receiving the useful mission performance.

6. Cost-plus contracts require that an agency exercise significant oversight over the contract to ensure that it is paying only for allowable costs. Yet EM refers to its oversight as being "arms-length."

Q: What does "arms-length" oversight mean?

In general, this is a theory used by the Department when specific tasks are required and the contractor is held responsible for completing such tasks without day-to-day overly prescriptive Federal oversight. In our view, the contractor should be charged with using its specialized expertise to complete such tasks. The contractor is allowed to use its own specifications and procedures to devise the most efficient and effective way to perform the

work. However, Federal government oversight in the form of validation of contractor claims, verification of actual progress, adherence to recognized metrics, and efforts to hold contractors accountable is still essential.

7. Most of EM's contracts use an award or incentive fee contract, but it does not appear that the fees paid realistically reflect contractor performance.

Q: How frequently are these fees, or their equivalents, paid despite nonperformance by contractors?

We have not conducted a comprehensive evaluation of this area.

8. The cost of the Waste Treatment Plant at Hanford has soared from \$4.3 billion to \$13.4 billion, and the GAO has indicated the cost may rise again. The Department's own guidelines, the DOE 413.3 Series, calls for baseline and requirements changes to be processed individually by the site Program Director and the Acquisition Executive.

Q: Can you verify that all the Waste Treatment Plant contract modifications were approved in accordance with these guidelines?

We are not in a position to provide such assurance.

9. The GAO has stated that, in addition to the ultimate cost and completion date for the Waste Treatment Plant, it is concerned whether the plant will ever be successful given that several critical technologies have not been tested and verified.

Q: Do you agree with the GAO?

Project failure is always a concern when technologies have not been tested and verified. With regard to the Waste Treatment Plant (WTP), we have identified unresolved issues related to pulse jet mixers and quality assurance issues with inaccessible black cells. In our view, these concerns and other technological concerns render the WTP project risk a possibility which requires active Department of Energy oversight. We are currently doing additional work in this area at the WTP.

**Post-Hearing Questions for the Record  
Submitted to the Honorable Gregory H. Friedman  
From Senator Ron Johnson**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. You cited concerns about the quality and expertise of the federal workforce tasked with overseeing DOE’s contractors. Are there specific areas in which you have found that DOE project managers lack necessary expertise to effectively run these projects?

As we noted in our testimony, we have observed instances of insufficient Federal staffing, in terms of size and expertise, to provide effective contract and project oversight. For example, in our audit on *The Department of Energy’s K-25 Building Decontamination and Decommissioning Project* (DOE/IG-0854), we reported that the K-25 Federal Project staff consisted of only nine full-time-equivalents (FTE) even though the Department’s staffing models indicated that 22 FTEs were needed to provide the oversight necessary to protect the taxpayer’s interests. We also observed numerous changes in Federal leadership for this Project. Specifically, since 2007 four different Project directors have overseen this Project. These sorts of rapid changes in leadership are not comforting, especially in projects as large as K-25. Whether or not leadership change or leadership competence is a proximate cause, the K-25 effort has seen more than its share of problems.

**Post-Hearing Questions for the Record  
Submitted to the Honorable Joseph F. Bader  
From Senator Claire McCaskill**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. The Department of Energy has been on GAO’s high risk list for its contract management for over 20 years. The Department’s projects have had chronic cost overruns and schedule delays. One reason appears to be that safety issues are not incorporated in the design and planning phase of these projects.

Q: Does the Defense Nuclear Facilities Safety Board (“Safety Board”) have concerns about safety issues being incorporated into project planning?

*Board’s Response:*

*The Board continues to have concerns about DOE identifying and addressing safety issues during project planning. Ongoing Board concerns are explained in the 23<sup>rd</sup> Annual Report to Congress<sup>1</sup>, which states that the Department of Energy (DOE) continues to struggle to integrate safety early into its large, complex design projects and to improve timeliness in resolving safety-related issues. Two current examples involve the Uranium Processing Facility (UPF) at the Y-12 National Security Complex and the Hanford Waste Treatment and Immobilization Plant (WTP).*

*In an April 2, 2012, letter to the National Nuclear Security Administration (NNSA), the Board expressed concern that the project team developing the UPF at the Y-12 National Security Complex had not integrated safety adequately into the preliminary design. The Board identified numerous deficiencies, including that the hazard analyses failed to analyze all hazards necessary to comply with the methodology in DOE Standard 3009, “Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses,” and DOE Standard 1189, “Integration of Safety into the Design Process,” for performing unmitigated hazard analysis. NNSA is taking corrective actions to revise the UPF project’s safety documentation.*

*In the case of Hanford WTP, DOE has (1) struggled to integrate safety into the design, (2) implemented a significant redesign of the project in 2009, well into construction, and (3) not resolved the most critical open technical issues related to nuclear safety. For example, DOE’s response to the Board’s Recommendation 2010-2, “Pulse Jet Mixing at the Waste Treatment and Immobilization Plant,” continues to be delayed. On April 30, 2012, DOE informed the Board that the approach described in the DOE implementation plan to verify the vessel mixing system design was inadequate. DOE committed to revise their implementation plan to describe a workable approach by*

<sup>1</sup> This report can be found at: <http://www.dnfsb.gov/board-activities/reports/reports-to-congress/twenty-third-annual-report-congress>

*December 31, 2012. However, in the ensuing period, the Secretary of Energy undertook a more comprehensive review of the plant's design. In a letter dated November 8, 2012, the Secretary informed the Board that this review may result in further changes to DOE's approach to resolve safety-related mixing and other technical issues. The Secretary committed to incorporate these changes into a revision of the Recommendation 2010-2 implementation plan. Meanwhile, DOE slowed the construction of two key facilities of the treatment plant to resolve longstanding safety-related issues and address the impacts of the resulting technical solutions on the WTP design.*

Q: Ideally, at what point would the Safety Board be consulted in the planning process?

*Board's Response:*

*One of the key functions in the Board's Enabling Statute is:*

***(4) Review of facility design and construction.***

*The Board shall review the design of a new Department of Energy defense nuclear facility before construction of such facility begins and shall recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety. During the construction of any such facility, the Board shall periodically review and monitor the construction and shall submit to the Secretary, within a reasonable time, such recommendations relating to the construction of that facility as the Board considers necessary to ensure adequate protection of public health and safety. An action of the Board, or a failure to act, under this paragraph may not delay or prevent the Secretary of Energy from carrying out the construction of such a facility.*

*When performing this function, the Board conducts its formal reviews of DOE's project information in accordance with the availability of documentation associated with DOE's acquisition decision process as laid out in DOE Order 413.3B, "Program and Project Management for the Acquisition of Capital Assets." Within this process, DOE's Critical Decision phases are aligned with the production of safety documentation and resolution of project issues. This allows the Board to identify and communicate any concerns it may have to DOE and stay off DOE's critical path. This is the Board's goal. Significant DOE project design changes after beginning construction or failure to adequately resolve known safety issues have resulted in cost increases and project delays. In the July 19, 2007, Joint Report to Congress, the Board and DOE stated that a number of problems have resulted from the untimely identification and resolution of safety issues during the design and construction of new defense nuclear facilities. Both the Board and DOE recognize that untimely identification and resolution of safety issues has resulted in large part from the failure by DOE to adequately identify and incorporate safety requirements into the design at the earliest stages of a project.*

Q: What would allow the Safety Board to be brought into the planning process earlier?

*Board's Response:*

*As described in the previous response, the Board's Enabling Statute requires that the Board review the design and construction of new Department of Energy defense nuclear facilities. In actual practice, the Board's involvement is predicated upon DOE's generation of safety and design documents as the project matures through the DOE's Critical Decision phases. This process is described in DOE Standard 1189 and DOE Order 413.3B. The Board carefully documents its concerns in (1) Board letters and Recommendations to DOE, (2) "Project Letters" at DOE's Critical Decision points for conceptual and preliminary design, and (3) the Board's Periodic Report to Congress.*

Q: Are there other ongoing projects that the Safety Board is concerned about?

*Board's Response:*

*The Board's Periodic Report to Congress is designed to answer this question with a section named "Projects with the Most Significant Unresolved Safety Issues." The latest Report to Congress was issued on July 15, 2013. Within that report, the Board identified the following projects as having the most significant unresolved safety issues: (1) the seismic evaluation and upgrade of Los Alamos National Laboratory's (LANL) Plutonium Facility (PF-4), (2) the Hanford Site's WTP, and (3) the UPF at the Y-12 National Security Complex. Further details and a summary of the Board's safety concerns are contained in the report.*

2. The Safety Board conducted an investigation into the safety culture at the Waste Treatment Plant at Hanford in 2011, and found that "DOE and contractor project management behaviors reinforce a subculture that deters the timely reporting, acknowledgement and ultimate resolution of technical safety concerns."

Q: What specific behaviors led to this conclusion?

*Board's Response:*

*The Board's June 9, 2011 Recommendation, "Safety Culture at the Waste Treatment and Immobilization Plant," (Board Recommendation 2011-1) states that there were significant failures by both DOE and contractor management to implement their roles as advocates for a strong safety culture. The Recommendation went on to state that there was unusually high tension at the WTP project between organizations charged with technical issue resolution and development of safety basis scope, and those organizations charged with completing design and advancing construction. This unhealthy tension rendered the WTP project's formal processes to resolve safety issues largely ineffective. DOE reviews and investigations failed to recognize the significance of this fact. Consequently, neither DOE nor contractor management had taken effective remedial*

*action to advance the Secretary's mandate to establish and maintain a strong safety culture at WTP.*

Q: Has the Safety Board found similar subcultures at other project sites?

*Board's Response:*

*In the Secretary's Implementation Plan to address Board Recommendation 2011-1, the Secretary of Energy agreed to conduct an Extent of Condition review to determine whether safety culture weaknesses are limited to the WTP project or are more broadly occurring in DOE's defense nuclear complex. DOE has completed the following broadened set of independent safety culture assessments:*

- *LANL, Chemistry and Metallurgy Research Replacement (CMRR) Project;*
- *Y-12 National Security Complex, UPF Project;*
- *Idaho Cleanup Project, Sodium Bearing Waste Treatment Project;*
- *Savannah River Site, Salt Waste Processing Facility;*
- *Pantex Plant;*
- *Office of Environmental Management (EM) Headquarters.*

*As explained in the Board's 23<sup>rd</sup> Annual Report to Congress, these assessments were led by DOE's independent recognized experts in safety culture and found weaknesses in safety culture throughout the DOE defense nuclear complex. A number of important actions remain, including performing self-assessments at sites and facilities not assessed by the Office of Health, Safety and Security; integrating the findings across the complex into a coherent whole; and developing tools to sustain a robust nuclear safety culture throughout DOE's defense nuclear complex.*

3. One reason for DOE's poor cost estimates is that EM has initiated construction of facilities before completing their design, also known as the "design-build" model.

Q: How has the design-build model impacted projects from the Safety Board's perspective?

*Board's Response:*

*The most visible "design-build" project in the DOE complex is the Hanford Site's WTP. On March 22, 2012, the Board held a Public Hearing and Meeting to discuss the status of actions related to unresolved technical safety issues in the design of the WTP and infrastructure needs at the Hanford Tank Farms. The Board also examined the*

*relationship between the resolution of these unresolved safety issues and development of a sound nuclear safety strategy.*

*In the opening remarks, the Board recognized that DOE's decision to pursue a design-build, fast-track approach for this project involves greater risk than would a traditional design and construction approach. The Board's concerns are with DOE's decisions to continue design and construction of the plant when there are many major unresolved technical issues that can impact not only safety-related controls needed to protect the public and workers, but also the reliability and capability of a plant that must operate safely for decades. Once the plant is operating and processing radioactive waste, options for physical changes in process cells will be extremely limited, costly, and likely to expose workers to hazardous situations. To the maximum extent possible, solutions to design and operational issues must be accommodated before commissioning the plant. In summary, a learn-as-we-go operating philosophy is not prudent or safe for this facility.*

4. At the hearing there was a discussion regarding the Safety Board's role in decisions made to modify the design of the Integrated Waste Treatment Unit at Idaho and whether these modifications led to delays.

Q: Can you clarify the Safety Board's role in decisions to make safety modifications and what if any impact the Safety Board's recommendations had on the project's schedule?

*Board's Response:*

*With regard to the IWTU, the Board does not believe it contributed to the increases on the project's schedule. The Board issued two letters that provided independent analysis and advice to DOE about IWTU.*

*The Board's enabling legislation states that the Board's mission is to provide independent analysis, advice, and recommendations to the Secretary of Energy to inform the Secretary, in the role of the Secretary as operator and regulator of the defense nuclear facilities of DOE, in providing adequate protection of public health and safety at such defense nuclear facilities. As such, the Board does not have a decision making role for safety modifications for any defense nuclear facility. That role lies solely with DOE.*

*In the first letter, dated January 24, 2007, the Board stated there were not any significant safety issues at the IWTU at the Idaho National Laboratory. However, the Board did state that several items should be resolved prior to final design and construction. These items are listed below and were reported as open Board issues in the Board's Periodic Report to Congress from 2007 to 2009. The Board documented DOE's resolution of these issues in the Board's February 9, 2009, Periodic Report to Congress.*

- *Pilot plant testing*

- *Waste characterization*
- *Distributed control system design*

*The topic of the second Board letter, dated May 1, 2008, was the seismic and structural design of the IWTU. The Board's reviews revealed a number of issues related to the development of the design basis ground motion and overall seismic design for the facility. The issues originated in 2006 due to DOE's change in design requirements, during the preliminary design phase, to increase the facility scope to include the ability to process additional waste stored at the Idaho site. DOE's change in project scope required that the process and packaging cells meet a higher seismic design performance than was previously required.*

*The letter further stated that, as a result of significant efforts made by the DOE's Idaho Operations Office (DOE-ID) and the IWTU structural designer, Simpson, Gumpertz & Heger, all issues were resolved, and appropriate changes to the design were made. The Board commended both DOE-ID and Simpson, Gumpertz & Heger for resolving these issues in an expeditious manner. IWTU is currently progressing to the hot commissioning stage of operations, which is anticipated for 2014.*

**Post-Hearing Questions for the Record  
Submitted to the Honorable Joseph F. Bader  
From Senator Ron Johnson**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. How many recommendations has the DNFSB made to DOE since it was created? Have any not been accepted by DOE?

*Board's Response:*

*Over the 23-year period of 1990 to 2013, the Board has issued 57 Recommendations to the Secretary of Energy. Only one of the Board's Recommendations has been partially rejected. This was Recommendation 2010-1, "Safety Analysis Requirements for Defining Adequate Protection for the Public and Workers." Currently, there are 12 open Recommendations.*

2. The hearing highlighted a number of cases, including the Hanford Waste Treatment Plant and the Idaho National Lab Integrated Waste Treatment Unit where DNFSB recommendations or other input received midway through a project caused delays and cost increases. In your written testimony, you discussed DNFSB and DOE efforts since 2005 to better coordinate on review of safety design elements early in the process. How have these efforts changed DNFSB involvement in project oversight since 2005? Please provide an example of a project where DNFSB-DOE early collaboration has yielded benefits.

*Board's Response:*

*The Board disagrees with the contention that the Board caused delays and cost increases in DOE's design and construction projects, including Hanford's Waste Treatment and Immobilization Plant and the Idaho National Laboratory's Integrated Waste Treatment Plant. The Board conducts its formal reviews of DOE's project information in accordance with the availability of documentation associated with DOE's acquisition decision process as laid out in DOE Order 413.3B, "Program and Project Management for the Acquisition of Capital Assets." Within this process, DOE's Critical Decision phases are aligned with the production of safety documentation and resolution of project issues. This allows the Board to identify and communicate any concerns it may have to DOE and stay off DOE's critical path. This is the Board's goal. DOE has experienced cost increases and project delays as a result of its decisions to implement significant project design changes after beginning construction or failure to adequately resolve known safety issues.*

*On the question about how the Board's involvement in project oversight changed since 2005, incorporating safety issues into project planning was the topic of a series of three Board public hearings and meetings from December 7, 2005, to March 22, 2007. The purpose of these public hearings and meetings was to discuss policies, expectations, and processes for integrating safety into the design of DOE's defense nuclear facilities.*

*The meetings were the result of the Board's observation that DOE demonstrated considerable difficulty integrating safety into the design of certain defense nuclear facilities. DOE's difficulties are attributed to the lack of integration of safety during the design development process, inadequate development of design criteria, or proposed designs that do not meet intended safety goals. The situation is further complicated because construction usually starts before the design is complete and typically DOE's unresolved safety issues are closely coupled with broader concerns that include technical, operational, maturation of technology, and construction schedule issues. In the 2007 public hearing and meeting on safety-in-design, the Board and DOE agreed that implementation of safety at the earliest stages in the design of an environmental clean-up or construction project is crucial to achieving mission related goals and reducing cost increases and schedule delays. It was also agreed that integrating safety late in the design process can lead to cost increases and schedule delays.*

*A summary of how the efforts to identify and resolve safety issues early in the design process changed DNFSB involvement in project oversight is contained in the July 19, 2007, "Report to Congress on the Status of Significant Unresolved Technical Differences between the Board and the Department of Energy on Issues Concerning the Design and Construction of DOE's Defense Nuclear Facilities." Enclosure (1) of that report summarizes the actions the Board and DOE took to provide for more timely identification and resolution of safety-related technical issues raised by the Board. These actions include the following:*

- *Issuance of "Project Letters" that summarize unresolved safety issues and the Board's view of the safety status of projects at appropriate critical decisions. For example, Board Project Letters are typically issued as the project advances from conceptual, to preliminary, and to final design. Starting in 2007, the Board has issued 15 Project Letters on 10 different design and construction projects with the latest being issued in July 2012.*
- *Issuance of "Periodic Reports to Congress" that summarize to the Congress unresolved safety issues on a project by project basis. To date, the Board has issued 19 Periodic Reports to Congress with the latest being issued in July 2013.*
- *DOE updated DOE Order 413.3A, "Program and Project Management for the Acquisition of Capital Assets," which implements changes focused on early integration of safety into design.*
- *DOE implemented a new Standard 1189, "Integration of Safety into the Design Process." The standard implements specific actions during the project design phase to achieve the safety-in-design objectives incorporated into DOE Order 413.3A. DOE committed to updating Standard 1189 as part of the implementation plan to resolve the Board's Recommendation 2010-1, "Safety Analysis Requirements for Defining Adequate Protection for the Public and the Workers."*
- *DOE and the Board selected two major projects, the Uranium Processing Facility and the Integrated Waste Treatment Unit (IWTU), to demonstrate safety-in-design requirements of Order 413.3A and Standard 1189.*

*DOE and the Board chose the IWTU at the Idaho National Laboratory to pilot the integration of the safety and design initiative. In the Board's view, the IWTU project represents a good example of how the Board's collaboration with DOE yielded positive safety-related results. The Board issued two letters on IWTU, a Board Project Letter and a Board Letter containing a staff issue report. In the first Project Letter, dated January 24, 2007, the Board stated that it did not have any significant safety issues regarding the IWTU at that time. However, the Board believed that several safety-related items should be resolved prior to final design and construction. These items were reported as open Board issues in the Board's Periodic Reports to Congress from 2007 to 2009. The Board documented DOE's resolution of these issues in the Board's February 9, 2009, Periodic Report to Congress.*

*The topic of the second Board Letter, dated May 1, 2008, addressed IWTU's seismic and structural design. The Board's reviews revealed a number of issues related to the development of the design basis ground motion and overall seismic design for the facility. This letter further stated that as a result of significant efforts made by the DOE's Idaho Operations Office (DOE-ID) and the IWTU structural designer, Simpson, Gumpertz & Heger, all issues were resolved and appropriate changes to the design were made. The Board commended both DOE-ID and Simpson, Gumpertz & Heger for resolving these issues in an expeditious manner. IWTU is currently progressing to the hot commissioning stage of operations, which is anticipated for 2014.*

3. In your testimony, you stated that while the DNFSB does not conduct cost-benefit analyses of its recommendations, it does consider their "economic feasibility." What standard does the DNFSB use to assess economic feasibility?

*Board's Response:*

*The Board's interpretation of the technical and economic feasibility of Recommendations is documented in a February 14, 2013, report to the Chairmen and Ranking Members of the Senate and House Armed Services Committees [copy enclosed]. The report states that each of the Board's five members individually assess the economic feasibility of a Recommendation based on careful consideration of the data, briefings, and technical discussions held with/provided by DOE and the Board's staff. The Board considers economic feasibility by comparing the rough order of magnitude<sup>1</sup> cost of alternative approaches and structuring Recommendations so as to allow the Secretary flexibility in designing cost-effective actions needed to address Board Recommendations. Congressional guidance on the criterion for economic feasibility states that (1) the Board is not required "to make formal findings concerning economic or technical feasibility"<sup>2</sup> and (2) "the burden of demonstrating that a Recommendation is not technically or economically feasible rests with the Secretary."<sup>3</sup>*

Enclosure

<sup>1</sup> Rough-order-of-magnitude cost estimates are described in "GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs" (GAO-09-3SP, March 2, 2009).

<sup>2</sup> S. REP. NO. 100-173, at 28-29 (1987).

<sup>3</sup> *Id.*

Peter S. Winokur, Chairman  
Jessie H. Roberson, Vice Chairman  
John E. Mansfield  
Joseph F. Bader  
Sean Sullivan

**DEFENSE NUCLEAR FACILITIES  
SAFETY BOARD**

Washington, DC 20004-2901



February 14, 2013

The Honorable Carl Levin  
Chairman  
Senate Armed Services Committee  
United States Senate  
269 Russell Senate Office Building  
Washington, DC 20510

The Honorable James Inhofe  
Ranking Member  
Senate Armed Services Committee  
United States Senate  
205 Russell Senate Office Building  
Washington, DC 20510

Dear Chairman Levin and Ranking Member Inhofe:

The Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for the National Defense Authorization Act for Fiscal Year 2013 directed the Chairman of the Defense Nuclear Facilities Safety Board to "... submit a report to the congressional defense committees by February 15, 2013, regarding how the DNFSB considers the technical and economic feasibility of implementing its recommended measures." (Report, p. 394)

On behalf of the DNFSB, I am pleased to submit the report appended to this letter in response to the Conference Committee's direction.

Sincerely,

A handwritten signature in black ink, appearing to read "Peter S. Winokur".

Peter S. Winokur, Ph.D.  
Chairman

cc: The Hon. Ben Nelson, Chairman, Senate Armed Services Strategic Forces Subcommittee  
The Hon. Jeff Sessions, Ranking Member, Senate Armed Services Strategic Forces Subcommittee

Peter S. Winokur, Chairman  
Jesse H. Roberson, Vice Chairman  
John E. Mansfield  
Joseph F. Bader  
Sean Sullivan

**DEFENSE NUCLEAR FACILITIES  
SAFETY BOARD**  
Washington, DC 20004-2991



February 14, 2013

The Honorable Howard P. "Buck" McKeon  
Chairman  
House Armed Services Committee  
United States House of Representatives  
2310 Rayburn House Office Building  
Washington, DC 20515

The Honorable Adam Smith  
Ranking Member  
House Armed Services Committee  
United States House of Representatives  
2264 Rayburn House Office Building  
Washington, DC 20515

Dear Chairman McKeon and Ranking Member Smith:

The Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for the National Defense Authorization Act for Fiscal Year 2013 directed the Chairman of the Defense Nuclear Facilities Safety Board to "... submit a report to the congressional defense committees by February 15, 2013, regarding how the DNFSB considers the technical and economic feasibility of implementing its recommended measures." (Report, p. 394)

On behalf of the DNFSB, I am pleased to submit the report appended to this letter in response to the Conference Committee's direction.

Sincerely,

A handwritten signature in black ink, appearing to read "P. S. Winokur".

Peter S. Winokur, Ph.D.  
Chairman

cc: The Hon. Mike Rogers, Chairman, House Armed Services Strategic Forces Subcommittee  
The Hon. Jim Cooper, Ranking Member, House Armed Services Strategic Forces Subcommittee

## Board Interpretation of "Technical and Economic Feasibility"

### I. Introduction

The Board's enabling act, 42 U.S.C. § 2286 et seq., tasks the Board with issuing recommendations to the Secretary of Energy regarding public health and safety at the Department of Energy's (DOE's) defense nuclear facilities. Section 2286(a)(5) contains the following requirement: "In making its recommendations, the Board shall consider the technical and economic feasibility of implementing the recommended measures."<sup>1</sup> In this report, the Board explains how it implements this statutory requirement.

### II. Overview

It is the role of the five Board Members, nominated by the President and confirmed by the Senate as recognized experts in nuclear safety matters, to individually make their own decision on whether the recommendation they are considering is technically and economically feasible. Such a decision is made based on a careful consideration by each Board Member individually of the sum total of the information, data, briefings and technical discussions held with/provided by DOE and Board staff. This material is made available over the considerable period of time from initial consideration of a safety issue and whether it rises to the level of a recommendation through final approval/denial of the proposed draft before the Board Member.

The Board considers technical feasibility by ensuring that each recommendation is capable of implementation using generally accepted scientific and engineering principles. The Board considers economic feasibility by comparing the rough order of magnitude cost of alternative approaches and structuring recommendations so as to allow the Secretary flexibility in designing cost-effective actions needed to address Board recommendations. The Board does not use a cost-benefit analysis formula.

The Board's consideration of technical and economic feasibility is guided by the substantial legislative record surrounding the development and approval of the Board's enabling act by Congress. The principal sponsor of the Board's enabling act in the late 1980s was Senator John Glenn of Ohio, then Chairman of the Senate Committee on Governmental Affairs. Senator Glenn introduced S. 1085, the "Nuclear Protections and Safety Act of 1987," in April of 1987. The Committee on Governmental Affairs reported on the bill on September 24, 1987, in Senate Report 100-173 which addressed the subject of "technical and economic feasibility," quoted in full below:

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<sup>1</sup> This provision was recently amended by the National Defense Authorization Act for Fiscal Year 2013 to read: "In making its recommendations, the Board shall consider, *and specifically assess risk (whenever sufficient data exists)*, the technical and economic feasibility of implementing the recommended measures" (emphasis added).

[I]n making its recommendations, the Board is directed to consider technical and economic feasibility. This is not a cost-benefit analysis formula. The Board's recommendations to substantially reduce the likelihood that events will occur at any DOE nuclear facilities should not be restricted by cost. Technical feasibility requires that the Board's recommendation be capable of implementation using generally accepted scientific and engineering principles. Addressing economic feasibility means that in seeking to reduce risks, the Board should compare the costs of alternative approaches so as to structure any recommendation in an economic manner. For example, the Board may determine that it will cost five hundred million dollars (\$500,000,000) to reduce substantially the likelihood of a nuclear event at a twenty-year-old DOE production reactor, which has an expected useful life of twenty-three to twenty-five years and a replacement value of one billion dollars (\$1,000,000,000). Under those circumstances, the Board could indicate what technical and engineering improvements would be needed to repair the existing facility so that it could achieve acceptable standards for continued operation, but recommend closing such an old facility and accelerating the planning and construction of a new, replacement facility as a more economic use of federal dollars.<sup>2</sup>

Fifth, subsection (g)(6)(A) directs the Board in making recommendations to consider technical and economic feasibility. This standard does not require the Board to make formal findings concerning economic or technical feasibility. It is further recognized that the Board's recommendations will never be subject to scientific or economic certainties or be without controversy. Inevitably there will be instances where the Secretary believes the Board has not properly evaluated the data and reached correct conclusions concerning the safety of DOE's facilities. In those instances where the Secretary believes the Board's recommendation addresses a non-existent or extremely remote technical possibility, and implementing the changes will be extremely burdensome, the Secretary may disagree with the Board utilizing subsections (h)(1)(A) and (h)(2)(B)(i). The burden of demonstrating that a recommendation is not technically or economically feasible rests with the Secretary. If the Secretary disagrees with the Board's recommendation on these grounds, subsection (h)(2)(B)(i) requires the Secretary to report the disagreement to Congress and the President, along with the reasons for the Secretary's decision.<sup>3</sup>

S. 1085 was referred to the Senate Committee on Armed Services, then chaired by Senator Sam Nunn of Georgia. This committee reported on the bill on November 20, 1987. While the committee recommended a number of changes to the bill, it did not modify the "technical and economic feasibility" requirement for Board recommendations. The committee offered the following comment:

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<sup>2</sup> S. Rep. No. 100-173, at 28-29 (1987).

<sup>3</sup> *Id.* at 30.

[I]n making its recommendations, the Board is directed to consider technical and economic feasibility. Technical feasibility requires that the Board's recommendations be capable of implementation using generally accepted scientific and engineering principles. Economic feasibility means that the Board may compare the cost of alternative approaches and structure its recommendations so as to reflect cost comparisons. The Board may compare the costs of alternative approaches to achieving adequate protection of public health and safety. The Board may consider such factors as the remaining useful life of facilities, schedules and plans for replacing them, and means to mitigate disruptions to ongoing operations that may result from recommended safety improvements, and other considerations.<sup>4</sup>

The Board has followed the guidance provided by the Senate committees during the ensuing 23 years and 57 formal recommendations.

The following three general principles can be extracted from the committee reports:

- The requirement to consider technical and economic feasibility "is not a cost-benefit formula."<sup>5</sup>
- The Board is not required "to make formal findings concerning economic or technical feasibility."<sup>6</sup>
- "The burden of demonstrating that a recommendation is not technically or economically feasible rests with the Secretary."<sup>7</sup>

The first of these principles is a direct consequence of the enabling act requirement that the Board determine a recommendation is "necessary to ensure adequate protection of public health and safety."<sup>8</sup> Hence, recommendations are not to concern safety above and beyond the Atomic Energy Act standard, but rather should look to achieving that standard of adequate protection. The courts have held that, unless required by statute, cost may not be weighed against measures needed to meet the statutory standard.<sup>9</sup>

The second and third principles are interrelated. The language of the statute directs the Board to "consider" technical and economic feasibility, yet Congress was aware that the Board would ultimately have to defer to the Secretary on application of these criteria. This is so because the Secretary is assigned the task of evaluating the Board's recommendations before drafting and providing to the Board an implementation plan. Part of this task involves deciding

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<sup>4</sup> S. Rep. No. 100-232, at 26 (1987).

<sup>5</sup> *supra* note 1.

<sup>6</sup> S. Rep. No. 100-173, at 28-29 (1987).

<sup>7</sup> *Id.*

<sup>8</sup> *Id.* at 5-7 (discussing the "adequate protection" standard to be used by the Board).

<sup>9</sup> See *Union of Concerned Scientists v. U.S. Nuclear Regulatory Comm'n*, 880 F.2d 552 (D.C. Cir. 1989); *Union of Concerned Scientists v. U.S. Nuclear Regulatory Comm'n*, 824 F.2d 108 (D.C. Cir. 1987), *reh'g en banc den.* 859 F.2d 237.

the best means to implement the safety objectives set forth in the recommendation. It therefore follows that the ultimate burden of deciding on technical and economic feasibility properly rests with the Secretary.

### III. Development of a Recommendation

Before moving to a discussion of the two separate criteria, it is important to explain how the Board decides to issue a recommendation. Prior to the preparation of a recommendation, the Board and its staff will have evaluated the safety implications as well as technical and regulatory issues of concern. This evaluation is comprised of many activities: Board Member and staff visits to affected sites; briefings to the Board by DOE and its contractors; exchanges of formal correspondence; staff-to-staff meetings; reports to the Board submitted under a reporting requirement; and, in some cases, public hearings. By the time a recommendation is considered, DOE will be fully aware of the Board's concerns and will have provided much of the information relied on by the Board to formulate its position. None of the Board's 57 recommendations have been issued without this level of review and analysis.

The Board applies its deep understanding of DOE's nuclear facilities, underlying technologies, programs, standards, and procedures to avoid recommending measures that simply cannot be implemented. The Board has always been pragmatic in its review of alternative means and methods proposed by DOE to meet the intent of a recommendation. In the great majority of cases, DOE has been able to develop an implementation plan suitable to address the safety problems of concern to the Board. However, disagreements have arisen over priorities, risks, and safety criteria. These disagreements were expected by Congress: "Inevitably there will be instances where the Secretary believes the Board has not properly evaluated the data and reached correct conclusions concerning the safety of DOE's facilities."<sup>10</sup> All regulatory and oversight systems involve tension over complex problems. The Board believes that the best approach to satisfying Congressional intent is to be extremely thorough in exploring safety concerns prior to considering whether a recommendation to the Secretary is needed.

### IV. Technical Feasibility

Both Senate reports include the same criterion for technical feasibility: is the recommended measure "capable of implementation using generally accepted scientific and engineering principles"?<sup>11</sup> This criterion would apply principally in cases where the Board recommends that DOE take specific physical actions such as installing new equipment, upgrading a safety system, engaging in a test program, and the like, as opposed to setting out a desired result without specifying means. Of its recommendations issued to date, 10 fall into this category.<sup>12</sup> In its other 47 recommendations, the Board is recommending that DOE address

<sup>10</sup> S. Rep. No. 100-173, at 28-29 (1987).

<sup>11</sup> *supra* note 1; *id.* at 30.

<sup>12</sup> Recommendations 90-1, 90-3, 90-7, 93-5, 95-1, 2000-1, 2004-2, 2010-2, 2012-1, 2012-2.

concerns in its safety framework, including safety management programs dealing with fire protection, quality assurance, confinement ventilation, packaging, and administrative controls.

Assurance of technical feasibility of recommended measures is provided by three factors. First, the Board Members themselves are legally required to be recognized experts in the field of nuclear safety and thus trained in physics, chemistry, nuclear engineering, and mathematics. Second, the Board has recruited and maintains a technical staff holding advanced degrees in nearly every technical discipline applicable to defense nuclear facilities. Outside experts are regularly engaged (as authorized by the Board's enabling legislation) whenever specialized knowledge is required. Third, the corporate knowledge represented by the Board Members and its staff extends into every field of nuclear science and engineering, from theory through to implementation, including construction, operations, and project management. Taken together, these factors enable the Board to assure that prior to issuing a recommendation, the technical measures necessary to address the recommendation are readily available should DOE choose to implement them. Specific examples of recent recommendations are included in Section VI below.

Additional assurance is provided by the fact that the Secretary has not responded to any Board recommendation by arguing that the measures requested by the Board are "technically infeasible." This record gives the Board confidence that it has faithfully followed the guidance of Congress to recommend measures "capable of implementation using generally accepted scientific and engineering principles."

#### V. Economic Feasibility

Congressional guidance on this criterion can be summarized in these three points:

- The burden of demonstrating that a recommended measure "will be extremely burdensome" to implement rests with the Secretary.<sup>13</sup>
- The Board may compare the cost of alternative approaches and structure its recommendations so as to reflect cost comparisons.
- The Board may consider such factors as the remaining useful life of facilities, schedules and plans for replacing them, and means to mitigate disruptions to ongoing operations that may result from recommended safety improvements, and other considerations.

The reason for the first of these has already been noted: only DOE can estimate with any accuracy the precise cost of implementing Board recommendations. In most recommendations the Board identifies a safety concern and safety objectives, but leaves up to the Secretary what specific actions will be taken. Moreover, the Board lacks the resources, expertise, and information base on which to make financial estimates.

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<sup>13</sup> S. Rep. No. 100-173, at 28-29 (1987).

In formulating the specifics of its recommendations and evaluating implementation plans, the Board does take into account such factors as “the remaining useful life of facilities, schedules and plans for replacing them, and means to mitigate disruptions to ongoing operations that may result from recommended safety improvements,”<sup>14</sup> and other considerations. Sometimes, the Board considers safety issues in an old DOE facility that may not be replaced for some years, if ever.<sup>15</sup> A recent example is the Board’s consideration of newly-discovered seismic deficiencies which led to Recommendation 2009-2, *Los Alamos National Laboratory Plutonium Facility Seismic Safety*.<sup>16</sup>

Near-term actions and compensatory measures to reduce significantly the consequences of seismically induced events will likely involve operating the facility with restrictions on material-at-risk, removing inventory from susceptible locations or storing material in robust containers, and reducing the likelihood of a fire following a seismic event by identifying and implementing appropriate safety measures. Consistent with the Board’s Recommendation 2004-2, *Active Confinement Systems*, one long-term strategy that could provide effective mitigation for seismic events involves upgrading the facility’s confinement ventilation system to meet seismic performance category 3 criteria. This strategy would allow the confinement ventilation system to reduce reliably the consequences of a seismically induced event by many orders of magnitude to acceptably low values.

When NNSA learned of a significant increase in the estimated ground motion that the Los Alamos Plutonium Facility could experience during an earthquake, the Board carefully considered the subsequent dose consequence to the public following such an event. The Board then purposely crafted Recommendation 2009-2 so as to give the Secretary maximum latitude to choose the most effective remedies. A wide range of economically-feasible remedies were considered by the Board, including reduction of material-at-risk (MAR), changes in facility operations, and facility replacement. Recommendation 2009-2 identified the severity and urgency of the situation and called for an acceptable safety strategy involving both immediate and long term actions to reduce this risk. As noted above, the Board recommended that installation of an active confinement ventilation system be considered as part of an effective long-term strategy for risk-reduction. In short, the Board identified the risk to the public, and further

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<sup>14</sup> *Budget Request for Department of Energy Atomic Energy Defense Activities and Department of Defense Nuclear Forces Program: Hearing Before the Subcomm. on Strategic Forces of the H. Comm. on Armed Services*, 112<sup>th</sup> Cong. 5-6 (2011) (statement of Dr. Peter S. Winokur, Chairman, Defense Nuclear Facilities Safety Board).

<sup>15</sup> Congress expected this situation to occur: “Under those circumstances, the Board could indicate what technical and engineering improvements would be needed to repair the existing facility so that it could achieve acceptable standards for continued operation, but recommend closing such an old facility and accelerating the planning and construction of a new, replacement facility as a more economic use of federal dollars.” S. Rep. No. 100-173, at 28-29 (1987).

<sup>16</sup> Issued October 26, 2009.

identified a wide range of economically-feasible remedies, then left it to the Secretary to select the specific remedial measures and timetable for implementation.

#### VI. Application of Principles to Recent Recommendations

In 2012 the Board issued two recommendations, both dealing with highly technical problems at defense nuclear facilities. On May 9, 2012, the Board transmitted Recommendation 2012-1, *Savannah River Site Building 235-F Safety*, to the Secretary of Energy. This recommendation dealt with removing plutonium-238 (Pu-238) contamination from an inactive facility. Recommendation 2012-2, *Hanford Tank Farms Flammable Gas Safety Strategy*, sent to the Secretary on September 28, 2012, addressed a serious safety problem at the Hanford Tank Farms. In both cases, the Board was fully informed as to the nature of the safety problem and recommended technically and economically feasible measures that should resolve the issues in a reasonable period of time.

##### Recommendation 2012-1

Building 235-F at the Savannah River Site no longer has a programmatic mission. It is operated in a surveillance and maintenance mode, is normally unoccupied, and houses several partially deactivated processing lines. With the exception of residual contamination, Building 235-F has been de-inventoried of special nuclear material. This residual contamination constitutes the principal hazard and includes a significant quantity of Pu-238. Pu-238 in this facility is in the form of highly dispersible, fine powder. This form increases the potential dose consequences associated with a release.

The Board first identified the need to remove Pu-238 from Building 235-F in a 2003 letter to the Secretary of Energy: "In particular, Building 235-F was anticipated to be shut down in the near future, but now is planned to be used for long-term storage and related operations...the risk from several hazards ha[s] been accepted rather than eliminated (e.g., combustible inactive cables in KAMS and ... plutonium-238 contamination in Building 235-F)."<sup>17</sup> Later in 2003, the Board filed a special report requested by Congress. The Board stated in regard to this same facility:

DOE should carry out its plan to remove and characterize plutonium materials currently stored in 235-F. DOE should not plan extended storage of plutonium in 235-F until it has completed implementing the proposals in this report. It may be preferable from safety, cost, and mission perspectives to pursue storage elsewhere at SRS. Options include an enhanced KAMS facility, a new storage facility, or an expanded PDCF.<sup>18</sup>

<sup>17</sup> Letter from John T. Conway, Chairman, Defense Nuclear Facilities Safety Board, to the Hon. E. Spencer Abraham, Secretary, U.S. Dep't of Energy (June 12, 2003). This letter was based on several years of work by the Board's technical staff in the form of onsite inspections of Building 235-F and review of DOE's documentation of the building's radioactive inventory.

<sup>18</sup> DEFENSE NUCLEAR FACILITIES SAFETY BOARD, STUDY OF FACILITIES FOR STORAGE OF PLUTONIUM AND PLUTONIUM MATERIALS AT SAVANNAH RIVER SITE 2-5 (2003).

The Board reiterated this concern in a second report to Congress in 2005. In that report, the Board stated:

The Board notes that DOE-SR intends to continue making some structural and equipment upgrades to 235-F. DOE-SR considers these upgrades necessary to provide confinement of plutonium-238 holdup in old processing cells should there be a significant earthquake. The presence of extensive plutonium-238 holdup is one of the most significant hazards in 235-F. The Board believes the first priority for DOE-SR should be to decontaminate the process cells to eliminate this hazard. Any structural or equipment improvements would be warranted only if the effort to decontaminate the plutonium-238 holdup were protracted. The Board will continue to follow this issue in the course of its normal safety oversight for the site.<sup>19</sup>

On a number of occasions from 2005 to 2012, DOE evaluated options and developed plans to remove Pu-238 residual contamination from this facility. However, because these efforts never moved beyond the planning stage, the Board found it necessary to recommend that the Secretary take action to reduce the radiological hazard of this deteriorating facility. By 2012, the Board and its staff had been involved in the technical issues presented for more than a decade. During that period, the Board had the opportunity to review DOE's own plans for Pu-238 decontamination, plans that were never put into effect. The Board became increasingly concerned that ventilation and fire protection systems were continuing to degrade. In addition, the construction of the MOX facility in recent years had placed many additional workers at risk.

Recommendation 2012-1 thus identified the need for DOE to take near-term actions to more effectively prevent a major fire in Building 235-F and to take action to remove and/or immobilize the residual contamination within Building 235-F because of the potential dose consequences to collocated workers and the public.

As regards to technical feasibility, the Board recommended near-term actions to reduce the fire hazards in Building 235-F from combustibles and electrical ignition sources. The Board pointed to a September 2011 walkdown of Building 235-F by Board staff that specifically identified a significant quantity of transient and fixed combustibles and unnecessary, non-air gapped electrical equipment. Remedial measures clearly involved generally accepted practices. The recommendation further addressed hazards associated with residual contamination. The Board understood that immobilization and/or removal of the hazardous material involved standard engineering practices.

As regards economic feasibility, the Board considered DOE's previous evaluations and plans to immobilize and/or remove residual Pu-238 contamination. The Board further understood that as an alternative to immobilization/removal of residual contamination,

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<sup>19</sup>DEFENSE NUCLEAR FACILITIES SAFETY BOARD, STUDY OF FACILITIES FOR STORAGE OF PLUTONIUM AND PLUTONIUM MATERIALS AT SAVANNAH RIVER SITE 2-4 (2005).

physical upgrades to fire and ventilation safety systems could also have resulted in adequate protection. However, given the lack of facility mission and remaining life, and the likelihood that immobilization/removal would ultimately be necessary, physical upgrades (other than early warning smoke and fire alarms) were understood to be economically inefficient. Accordingly, Recommendation 2012-1 advised the Secretary to take immediate, low cost actions such as removal of combustibles, de-energization and air-gapping of electrical ignition sources, evaluation of early detection alarm systems, and upgrades to the emergency response plan. The Secretary was further advised to immobilize or remove residual contamination as a long-term measure by whatever method the Secretary found to be most efficient and effective.

On July 10, 2012, the Secretary of Energy accepted the recommendation. In his acceptance letter, the Secretary stated:

DOE agrees with the Board that action must be taken to reduce the hazards associated with the material at risk that remains as residual contamination within Building 235-F. The Board acknowledged in its letter that DOE has taken action to de-inventory Building 235-F of special nuclear material. DOE has also taken action to remove the transient combustible material within Building 235-F and to limit access. In developing an Implementation Plan, DOE will address all sub-recommendations with the ultimate goal of reducing, to the extent feasible, the radiological hazards from residual contamination and the fire hazards due to excessive combustible materials and electrical ignition sources . . . We look forward to working with the Board as we work to reduce the hazards posed by Building 235-F.<sup>20</sup>

The Board is now reviewing DOE's implementation plan, submitted on December 5, 2012. The plan identifies no areas of the recommendation that, in DOE's view, are technically or economically infeasible.

#### **Recommendation 2012-2**

In this recommendation, the Board requested that DOE take a number of specific actions to reduce the accident threat posed by flammable gases in storage tanks at the Hanford Tank Farms. The ventilation systems for the double-shell tanks (DST's) in the Tank Farms are important in preventing and mitigating potential accidents involving the flammable gases generated by the high-level wastes stored in these tanks. The Tank Farms safety analysis shows that many of the tanks contain sufficient quantities of gas trapped in the waste such that flammability limits could be exceeded if the gases were spontaneously released, which is possible under both normal operating and accident conditions. Furthermore, all the double-shell tanks contain wastes that continuously generate flammable gases and would eventually create a flammable atmosphere in the tank without adequate ventilation. Consequently, ventilating the double-shell tanks will prevent hydrogen explosions in the vessel headspace.

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<sup>20</sup> Letter from the Hon. Steven Chu, Secretary, U.S. Dep't of Energy, to Dr. Peter S. Winokur, Chairman, Defense Nuclear Facilities Safety Board (July 10, 2012).

Tank ventilation has been the preferred safety strategy to adequately protect collocated workers and the public for most of the past two decades.

In 2010, DOE approved downgrading the functional classification of the ventilation systems from safety-significant to general service. In lieu of a credited engineered feature, DOE implemented an administrative control to monitor flammable gas conditions in the tanks. However, the Board identified a number of weaknesses with the administrative control, including the need to effectively measure flow rates in the ventilation system. The weaknesses collectively rendered the control inadequate to perform the specified safety function. The Board further noted that other engineered systems providing indications used in determining whether operators need to take corrective action were not classified as safety significant and would not be qualified or maintained by DOE in accordance with their safety function. The Board documented its concerns in a letter to DOE on August 5, 2010.

In response, DOE issued a letter to the Board on February 25, 2011, stating that it would take action to restore the double-shell tank ventilation systems to safety-significant status and upgrade other monitoring systems to safety-significant status. However, DOE did not make meaningful progress in accomplishing these important commitments. The Board therefore issued Recommendation 2012-2 to bring the issue to the attention of the Secretary.

As regards to technical feasibility, the Board considered the nature and severity of the flammable gas hazards in the Hanford DSTs, the reliability of DOE's chosen safety strategy, and DOE's applicable safety requirements. The Board's recommendation considered that active confinement ventilation is the most effective engineering solution used to prevent the build-up of flammable gases in radioactive waste storage vessels. The technical feasibility of the recommendation was self-evident in that the ventilation systems already existed and had been previously credited and relied upon to perform this vital safety function at the Tank Farms.

As regards to the economic feasibility, the Board specifically recommended that DOE use a graded approach and "... determine the necessary attributes of an adequate active ventilation system that can deliver the required flow rates within the time frame necessary to prevent and mitigate the site-specific flammable gas hazards at the Hanford Tank Farms." In this regard, the Board was sensitive to the costs of recommending extensive upgrades to the existing system. The Board's recommendation recognized that the primary considerations involved reliable flow monitoring and assurance of the prescribed flow rates. Consequently, the Board recommended installing safety related flow monitoring in the tank farm ventilation system and restoring safety related maintenance and testing requirements to the installed active ventilation systems to assure that the required flow rates were met.

The Secretary accepted Recommendation 2012-2 in these terms:

In developing an Implementation Plan (IP), DOE will take the pragmatic and graded approach detailed below to address the sub recommendations that will significantly improve the robustness of flammable gas controls in the near term. DOE is confident

this is the most expeditious approach to implement a more robust safety control for Double Shell Tank (DST) ventilation monitoring consistent with the intent of Recommendation 2012-2.

\* \* \* \*

DOE is committed to the safe operation of its nuclear facilities consistent with the principles of Integrated Safety Management and the Department's nuclear safety requirements. DOE values the Board's input on how the Department can improve its activities. We look forward to working with the Board and its staff on preparing DOE's IP for Recommendation 2012-2.<sup>21</sup>

From these statements it appears that DOE is confident the recommendation can be implemented using a "pragmatic and graded approach" that will fully satisfy the Board's safety objectives. The plan identifies no areas of the recommendation that, in DOE's view, are technically or economically infeasible.

#### **VII. Conclusion**

Over a period of some 23 years, the Board has endeavored to follow the guidance provided by Congress in applying the statutory requirement to consider "technical and economic feasibility." Proof that the Board has succeeded rests in the fact the Secretary has accepted every Board recommendation in whole or in part; partial acceptances have not been based on failure to meet the technical and economic feasibility criteria. The Board will continue in every case to pragmatically search for technically sound and economically feasible solutions to safety concerns at defense nuclear facilities, while being mindful of the ultimate requirement that adequate protection be provided to the public.

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<sup>21</sup> Letter from the Hon. Steven Chu, Secretary, U.S. Dep't of Energy, to Dr. Peter S. Winokur, Chairman, Defense Nuclear Facilities Safety Board (Jan. 7, 2013).



**Department of Energy**

Washington, DC 20585

February 24, 2014

The Honorable Claire McCaskill  
Chairman  
Subcommittee on Financial and Contracting Oversight  
Committee on Homeland Security and Governmental Affairs  
United States Senate  
Washington, DC 20510

Dear Madam Chairman:

On June 27, 2013, J. E. "Jack" Surash, Deputy Assistant Secretary for Acquisition and Project Management, Office of Environmental Management, testified regarding the Contract Management by the Department of Energy.

Enclosed are the answers to 17 questions submitted by you and Ranking Member Ron Johnson for the hearing record.

Also enclosed are five Inserts that were requested by Ranking Member Ron Johnson, Senator Mark Begich, and you to complete the hearing record.

If we can be of further assistance, please have your staff contact our Congressional Hearing Coordinator, Lillian Owen, at (202) 586-2031.

Sincerely,

A handwritten signature in black ink, appearing to read "Christopher E. Davis".

Christopher E. Davis  
Principal Deputy Assistant Secretary  
for Congressional Affairs  
Congressional and Intergovernmental Affairs

Enclosures

cc: The Honorable Ron Johnson, Ranking Member



**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 1. The Department of Energy is the largest civilian contracting agency, spending nearly 90% of its budget on contracts. Unfortunately, contract management seems to be the Department's biggest weakness. The Department of Energy has been on GAO's high risk list for its contract management for over 20 years.**

**Q1: What are the top three reasons the Department has struggled with contract management for so long?**

A1: The Department's April 2008 Root Cause Analysis highlighted three reasons for continuing challenges with contract management: inadequate front-end planning; inadequate numbers 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; and risks associated with projects were not objectively identified, assessed, communicated, and managed through all phases of planning and execution.

In January 2009, GAO acknowledged that DOE had met three of the five criteria for removal of high risk designation. In the 2013 biennial update, the GAO narrowed the scope of its high risk designation, to EM contracts and capital asset projects with costs greater than \$750 million. DOE leadership has continued to remain fully engaged and laser focused on our journey to continue contract and project management improvements.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

2. **The Department of Energy has been without a confirmed assistant secretary since 2011.**

**Q2: How have vacant leadership positions impacted the Department's ability to manage contracts effectively?**

A2: The Office of Environmental Management (EM) has had an Acting Assistant Secretary since the departure of the previous Assistant Secretary. After the acting appointment expired due to time limitations, the former Acting Assistant Secretary has remained with the program as a Senior Advisor for Environmental Management, and EM's Principal Deputy Assistant Secretary executes the statutory duties that cannot be performed by a Senior Advisor. EM continues to fulfill the mission of the program without impact on contract management activities.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

3. **One reason appears to be that safety issues are not incorporated in the design and planning phase of these projects.**

**Q3: At what point is the Defense Nuclear Facilities Safety Board (“Safety Board”) consulted in the planning process? Why isn’t the Safety Board brought into the planning process earlier to avoid unnecessary risks and costs?**

A3: The Defense Nuclear Facilities Safety Board (DNFSB) has the authority to review the Department’s defense nuclear construction projects at their earliest phase. As outlined in the DNFSB’s authorizing legislation, the Board has the ability to review the design of a new DOE defense nuclear facility before construction of such facility begins and can recommend to the Secretary, within a reasonable time, such modifications of the design as the Board considers necessary to ensure adequate protection of public health and safety.

In practice, DOE and DNFSB leadership and staff have both routine communications and periodic briefings to provide information on nuclear projects and activities. In addition, the DNFSB has access to DOE information, facilities and staff associated with nuclear projects from inception. The DNFSB has asked questions, provided comments, and written formal correspondence in the form of letters and recommendations providing the Board’s perspective throughout the lifecycle of many of DOE’s projects.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

4. **Most environmental remediation is concentrated among a few large contractors, who frequently form joint ventures with each other. These contractors refer to themselves as “competimates”, meaning that they may be competitors for one project, but joint venture teammates on another. While the Department has stated that it is fortunate to have well-qualified contractors capable of doing the technically complex tasks it demands, contractors outside this circle have complained that the Department is not open to working with new contractors.**

**Q4: Why does the Department rely on such a relatively small number of large contractors for its major projects?**

A4: Although the industrial base of contractors that are capable of executing nuclear projects at the requisite quality and safety levels is limited, DOE is open to and has made attempts to encourage new entrants to join the pool of qualified contractors. These efforts include industry days and site visits scheduled as part of our ongoing contractor community outreach efforts. DOE has also faced difficulties finding supplies of stainless steel piping and other materials that meet the stringent requirements required by NQA-1, the materials and constructions standards for nuclear facilities. However, all contractors must be capable of meeting the stringent requirements driven by nuclear facility construction and the operational rules put in place in the interest of public health and safety.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

5. **The GAO has stated that while the Department's baseline change proposal process requires documentation explaining the proposed change and why it is necessary, it does not require a root cause analysis of why the initial contract did not anticipate the factors that led to the need for modification.**

**Q5: Why doesn't the baseline change proposal report require any root cause analysis to determine why the original estimate failed to anticipate the cost?**

A5: DOE has established a rigorous contract change and project baseline change approval process that requires a detailed analysis of what caused the baseline change and an independent assessment of the impacts when certain thresholds are exceeded. Section 3.2.3 of DOE G 413.3-20, *Change Control, management Guide*, describes the steps for a Project Performance Baseline Change Process. A typical Baseline Change Proposal (BCP) package—which is generally drafted by contractor personnel and submitted for approval to the federal project team —includes:

1. **Reason/Justification:** An explanation of the need for the change, which is frequently attributable to Design Development; Risk Mitigation; Realization of Risk; External changes; or Poor performance.
2. **Schedule Milestone Impact Statement:** A statement that includes schedule revisions and explanations of milestone and date changes with "from" and "to" versions.
3. **Management Reserve, Contingency, Undistributed Budget or Additional Budget Requirements:** An explanation of the impact of the change on project cost.

**Work Breakdown Structure Affected:** The BCP includes identification of Work Breakdown Structure (WBS) elements affected as a result of the change. The WBS is a method of

breaking the total work to be performed under the contract into small units that have specific cost, schedule and performance criteria that can be separately tracked through completion by contractor management.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

6. **One reason for DOE's poor cost estimates is that EM has initiated construction of facilities before completing their design, also known as the "design-build" model.**

**Q6: Besides legacy projects, has the Department discontinued the "design-build" practice?**

A6: DOE has established a policy that requires the project design to be sufficiently mature and a project cost estimate with a high degree of confidence to be developed before construction begins. EM requires nuclear capital asset projects to complete 70-90% design prior to requesting baseline approval. In determining the sufficiency of the design level, factors such as project size, duration, and complexity are considered.

For basic facilities, such as administrative buildings, general purpose laboratories, and utilities, the design does not have to be as mature as for a complex chemical or nuclear processing facility. For projects that have well-defined requirements with limited complexity and risks, a design-build acquisition approach may be appropriate. Example projects include road construction, administrative facilities and/or replication of previously accomplished projects.

DOE Order 413.3B requires aggressive risk mitigation strategies for close-coupled or fast-tracked design-build projects. Risk management strategies must be outlined in the Risk Management Plan and at a minimum must address: all technical uncertainties; the establishment of design margins to address the unique nature of the design; and increased technical oversight requirements.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

7. **Cost-plus contracts require that an agency exercise significant oversight over the contract to ensure that it is paying only for allowable costs. Yet EM refers to its oversight as being “arms-length.”**

**Q7: What does “arms-length” oversight mean?**

A7: “Arms-length” means that DOE maintains organizational distance from its contractors to provide objective oversight to protect the taxpayer’s interests.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

8. **Most of EM's contracts use an award or incentive fee contract, but it does not appear that the fees paid realistically reflect contractor performance.**

**Q8a: How do you ensure that incentive fees are structured so that they are only awarded when performance goals are met?**

A8a: DOE tailors the incentives used under each contract to meet the requirements of the work under the particular contract. This requires analysis of what meaningful, verifiable, and completed work will serve as milestone for the desired outcomes of the contract or project under the contract. The Deputy Secretary of Energy's December 13, 2012, policy on aligning contract incentives for capital asset projects requires that performance measures link all or a substantial portion of the fee to the achievement of final outcomes rather than interim accomplishments. EM contracts are structured such that all or a significant portion of the fee for interim milestones will be provided provisionally and must be returned if the contractor does not fulfill its ultimate contractual obligations in accordance with the terms of the contract.

When DOE can estimate the total cost to perform a contract with reasonable certainty, the Department uses hard cost caps or cost share. If a contractor does not meet performance targets within the cost goals, the cost cap or cost share will shift the cost burden to the contractor. In this context, the contractor must still perform regardless of the costs it incurs and DOE will not reimburse any costs or reimburse only a portion of the costs beyond the stated amount as set forth in the contract, subject to certain legal limitations.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

**Q8b:** How often does EM use penalty clauses in contracts to penalize contractors who do not perform adequately?

**A8b:** The Deputy Secretary of Energy's December 13, 2012 memorandum on aligning contract incentives for capital asset projects provided policy guidance on the structure of incentives for new contract awards: First, no contract should be structured to reward contractors if the taxpayers are not well served. Second, the Department will structure contracts so that the contractors will bear responsibility for their actions (i.e. taxpayers should not pay for contractor negligence, poor performance, or error but share in savings or gains that they generate through better-than-promised performance).

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

**Q8c: What is DOE's policy on providing equitable adjustment to contractors when they have been unable to earn incentive fees through no fault of their own?**

A8c: If the contractor is entitled to an equitable adjustment under the contract due to a differing site condition, a change in the contract requirement, or other situation, the Contracting Officer considers the cost, schedule, and contract requirement changes necessary to place the contract in the same relative position it had been in regarding cost, schedule and technical performance achievement before the change to the contract. However, the Department follows the "no rollover" policy for award fee in the Federal Acquisition Regulation. A contractor never receives a second opportunity to earn award fee if due to its own failings it misses target dates or performance requirements tied to incentives.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

9. **The cost of the Waste Treatment Plant at Hanford has soared from \$4.3 billion to \$13.4 billion, and the GAO has indicated the cost may rise again. The Department's own guidelines, the DOE 413.3 Series, calls for baseline and requirements changes to be processed individually by the site Program Director and the Acquisition Executive.**

**Q9: Can you verify that all the Waste Treatment Plant contract modifications were approved in accordance with these guidelines?**

A9: The WTP project baseline for the current capacity was established in April 2003 at \$5.781B. This baseline was changed in December 2006 to \$12.263B. Both of these actions took place with appropriate approvals. All contract modifications have been within the bounds of these approved baselines and were properly authorized.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 10. The GAO has stated that, besides the ultimate cost and final completion date for the Waste Treatment Plant, it is concerned whether the plant will ever be successful given that several critical technologies have not been tested and verified.**

**Q10: How does DOE determine whether it is chasing the technologically impossible?**

A10: The current pause in construction activities for the Pretreatment and High Level Waste facilities is to allow for adequate testing to confirm aspects of the design that are currently unresolved. The technology being implemented as part of the WTP project has been used in other facilities. That technology must be extended and adapted to the circumstances at the WTP. What has not yet been proven is how that technology will react with the waste currently identified in the existing tank farms. The main area of focus is the testing to be performed with the pulse jet mixers. The current test plan will utilize full scale vessels. This will provide test results from actual vessels that will be used in the WTP. The results are expected to identify the limits of the mixing capability, if any, of the pulse jet mixers with the WTP waste.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 11. The House version of the National Defense Authorization Act contains a provision requiring the Secretary of Energy to submit a plan to Congress for the Waste Treatment Plant at Hanford.**

**Q11: Does the Department support this provision?**

A11: As Secretary Moniz has noted, the development of a plan for not just the Waste Treatment Plant, but also for the entire Office of River Protection's mission is a top priority at the Department. As DOE works to finalize a plan within the constraints imposed by the consent decree process, DOE plans to share the plan with all affected stakeholders, including Congress.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 12. In your testimony, you indicated that EM had completed approximately \$144 billion of non- Recovery Act worth of contract work since 1990, and that approximately 50% of those projects had come in over the original cost estimates.**

**Q12: What percentage of that \$144 billion in contract work surpassed original cost estimates?**

A12: EM's early work was largely comprised of extensive characterization of contaminated sites and risks, analysis of cleanup alternatives, level-of-effort landlord activities, and planning for the cleanup work needed at the sites. The first comprehensive estimates of EM's projected cleanup scope, cost, and schedule were developed in the mid-1990s. EM relied mostly on large, site-wide, cost reimbursable Management and Operating (M&O) contracts for cleanup work, until the transition in more recent years to largely non-M&O contracts. Prior to that transition, a cost baseline was generally not established for the contract itself, as it is now. In 1997-1998, EM organized the cleanup work scope into projects, establishing Project Baseline Summaries as a construct to capture programmatic information associated with the cleanup projects, including estimated life-cycle cost, schedule and scope required to complete the projects. Since that period many of the projects were rebaselined, often with changes to cleanup scope due to regulatory agreements or other factors. Therefore, EM does not have comparable data on the actual costs due to the project baseline changes over time.

**QUESTION FROM CHAIRMAN CLAIRE MCCASKILL**

- 13. In your testimony, you indicated the K-25 project went from an original baseline of approximately \$500 million to a rebaselined cost of approximately \$1.3 billion.**

**Q13: What was the original baseline of the K-25 project and what were the dates and costs of subsequent rebaselines of the contract?**

A13: The original project management baseline of the K-25 project was cost \$ 479.4M and schedule September 2017. This was established on April 8, 2010 based on the programmatic baselines that were approved on February 13, 2008. The subsequent revised baseline of the K-25 project had a cost of \$1.397B and a revised schedule for completion of December 2015. This rebaseline was approved on November 30, 2011. We expect the project will be completed approximately \$300M below the approved cost.

**QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q1: Has DOE ever not accepted a Defense Nuclear Facility Safety Board (DNFSB) recommendation? Does DOE ever provide input to DNFSB recommendations to make them more practical or cost-effective?**

A1: While DOE has never completely rejected a DNFSB recommendation there have been two instances where DOE partially rejected recommendations made by the DNFSB. In the 1996 for Recommendation 95-2, *Safety Management*, DOE accepted part of the recommendation but rejected one aspect of which called for the Department's "Safety Management Plans" to be "structured on the lines" of certain Board Technical Documents citing the need to maintain a flexible approach to these activities. Also, in 2000 for Recommendation 2000-1, *Stabilization and Storage of Nuclear Materials*, DOE accepted 9 of the recommendations total 11 sub-recommendations. In this case the DOE rejected the Board's specific call for DOE to account for costs from prior recommendation actions.

In addition as recently as 2010 DOE formally accepted one recommendation, DNFSB Recommendation 2010-2, *Pulse Jet Mixing at the Waste Treatment and Immobilization Plant*, which the DNFSB considered to be a partial rejection prompting DOE to clarify their acceptance.

With respect to providing input to the DNFSB on recommendation practicality and cost effectiveness, EM has engaged the DNFSB staff in discussions on the practicality and cost impacts through the development of subsequent implementation plans to address the recommendations.

**QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q2: In your testimony, you noted the cost and schedule problems at the Hanford Waste Treatment Plant (WTP) and Savannah River Salt Waste Processing Facility (SWPF). You and several other witnesses described how mid-project design changes played a major part in these overruns, such as the scaling up of the WTP from treating 40% to treating 100% of the waste in the tanks at Hanford. Provide timelines for both the WTP and SWPF of major decisions (by DOE and others) that increased the scope or otherwise changed requirements, including a short description of the reasons behind each change. To the extent possible, estimate the cost and schedule impact of each of these decisions.**

A2: SWPF: The general scope of the SWPF project has remained constant. However, technical issues have resulted in changes to both cost and schedule over the life of this project. The first issue was identified based on discussions with the Defense Nuclear Facilities Safety Board (DNFSB), additional design activities, and interactions with stakeholders and regulatory bodies. DOE then determined that certain processing areas of SWPF should be designed to meet seismic Performance Category 3 (PC-3), rather than PC-2 criteria and to apply more stringent nuclear QA requirements. This increased the cost from a range of \$375M to \$440M at Critical Decision (CD)-1, (Approve Alternative Selection and Cost Range), to an approved Total Project Cost (TPC) of \$899M at CD-2, (Approve Performance Baseline), and changed the schedule to achieve CD-4, (Approve Start of Operations/Project Completion), from February 2009 to November 2013. At that time the facility was at approximately 35 percent design complete for a first-of-a-kind nuclear facility.

Upon reaching the 90 percent design complete, the TPC approved at CD-3, was increased in January 2009 to \$1,339M; and CD-4 was approved at October 2015. The cost impact

of more stringent nuclear QA requirement application, the limited vendor pool for nuclear work, and a shortage of qualified nuclear design engineers, which caused project delays and increased costs, were cited as the basis for this cost increase. These changes directed by DOE ultimately resulted in an \$899M increase to TPC from the original \$440M and a schedule change of over 6½ years. The most recent change to the project is the result of poor performance by Parsons to fabricate 10 large vessels that needed to meet American Society of Mechanical Engineers requirements. In October 2010, Parsons terminated the subcontract with the vendor with no usable vessels. Parsons contracted with a new vendor to fabricate the vessels at an accelerated schedule (8 - 9 months) in an effort to maintain the project's schedule. The vessels were delivered and installed in May/June 2012 after approximately 18 months. In an attempt to keep construction momentum during this period, Parsons re-sequenced construction activities to mitigate the impacts of vessel delays. While construction progress continued, it did not mitigate the time lost by the vessel schedule delays. As a result, the project is experiencing a slip in schedule. A contract modification for completion of construction was negotiated at \$530M, a net increase of \$330M. A cost cap was established to limit DOE's financial liability for construction costs with a target construction completion by December 2016. The project is currently commencing negotiations with Parsons for the remainder of the contract scope covering commissioning (the remaining scope of the project), one year of operations, and six months support. While there have been no scope changes, the impacts of schedule delays, the increase in construction completion costs, and the estimate for commissioning activities will result in an increase to the project cost.

DOE is developing plans for finalizing the dates for commissioning and initial operations; project completion will not be achieved until after commissioning.

**WTP:** The Hanford Waste Treatment Plant's (WTP) original plan as a privatized venture allowed for construction to commence in December 2000 and hot operations were to start in December 2007 to treat approximately 10% of the tank waste (by mass) and 25% of the tank waste radioactivity inventory. The privatization effort was cancelled and Bechtel National Incorporated (BNI) was awarded a contract in December 2000 to construct the same size facility at an estimated cost of \$4.35B with a target completion date of December 2007. In April 2003, Modification A029 was negotiated with the principal change of increasing the throughput capacity of the Pretreatment (PT) and High-Level Waste (HLW) Facilities to complete the entire mission, thereby eliminating the need for a second treatment complex. The WTP cost at this time increased to \$5.781B with a completion date of July 2011. This cost of \$5.781B and schedule completion date of July 2011 was established as the project baseline as defined in DOE O 413.3.

On December 22, 2006 a Baseline Change Proposal (BCP) was approved by the Deputy Secretary of Energy based on evaluation of design and engineering changes, risks, and modifications submitted by the contractor BNI. This increased the Total Project Cost to \$12.263 Billion and established a new completion date of November 2019. The impact of this BCP increased the project cost by \$6.482B. This change was initiated in March 2005, when technical issues such as the criteria used for seismic design and the pulse jet mixers were identified as causing significant cost increases. Construction on the PT and

HLW facilities was stopped pending resolution of the seismic design basis. Construction resumed after approximately a year and a half. This impact was factored into the re-baseline. The resulting new baseline included cost impacts such as approximately \$670M for resolution of the technical issues, \$1,315M for time related costs such as escalation, \$745M for other design evolution costs, approximately \$540M for cost increases in labor and material, approximately \$2,415M for contractor management reserve/fee and DOE contingency, \$135M for other DOE costs, and approximately \$663M for other contractor costs.

**QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q3: In response to a question, you addressed the cost impact of the DNFSB's changes to the Integrated Waste Treatment Unit (IWTU) project at the Idaho National Lab, estimating that it was approximately \$20 or \$30 million. Please provide a more exact estimate of the impact. What is this cost impact estimate based upon? Does it include the cost of the year-plus delay?**

A3: In implementing DOE-STD-1021-93 Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components, the Department upgraded the safety-class structures, systems, and components from Performance Category (PC) 2 to PC 3 to provide adequate protection of workers, the public, and the environment. This was a DOE decision done in cooperation with DNFSB. Changing the design basis for the IWTU facility had a significant impact to the project cost and schedule. The actual cost impact was \$130 M due to the design changes and schedule delays. This cost impact is actually not a cost estimate; it is based on the contractor's actual cost that was paid to the contractor. The \$130 M impact represents the cost of the PC 2 to PC-3 design change and construction cost, and the one year plus delay. The portion of \$130 M due to the schedule delay was \$16 M.

**QUESTION FROM RANKING MEMBER RON JOHNSON**

**Q4: Much of the work on the WTP has been “paused” since last year while DOE assesses how to address identified technical challenges. When does DOE anticipate that this pause in work will be lifted? Does DOE anticipate that it will be able to identify solutions for all of the technical challenges identified by the DNFSB?**

A4: Construction on the PT Facility and certain portions of the HLW Facility has been halted while the technical review teams complete their reviews and analyses. Limited construction is underway in the HLW Facility in areas not affected by the technical issues. Construction can resume in the affected areas of the HLW Facility and the PT Facility once technical issues are resolved. Testing is currently being planned for the HLW technical issues. Technical issue resolution and alignment of the design with the safety bases is a primary focus in 2014 for the HLW facility. DOE will be in a position ramp up HLW construction after that as the issues are resolved and the alignments are completed.

All of the technical issues identified by the DNFSB are being addressed. A major emphasis of a Design Completion Team assembled to address the unresolved technical issues is mixing, which is also a concern of the DNFSB. Five sub teams under direction of the Design Completion Team comprised of DOE, contractor, members of the national laboratories and other technical experts have been tasked to develop solutions and alternatives to the issues, and identify a path forward to resolution. Construction work will not resume on the Pre-Treatment Facility until the resolution of the technical issues is completed.

1 contractors--the some 100,000 contractors that are employed  
2 at the Department of Energy--what percentage of those would  
3 you estimate are working on the environmental cleanup and  
4 environmental management?

5 Mr. Friedman. My understanding--it is 30,000.

6 Senator McCaskill. Thirty thousand. So those 30,000  
7 would have to be reassigned to another department of  
8 government, or we would just--

9 Mr. Friedman. No. Maybe I--perhaps I misunderstood  
10 your original question.

11 The functions that they are carrying out--cleaning up  
12 the sites that have been talked about here today--from my  
13 point of view, certainly, we have a moral obligation to  
14 continue that, whether we do it with the same contractors,  
15 different contractors or federalize it, if that is where we  
16 are heading.

17 Senator McCaskill. Right. Okay.

18 Mr. Friedman. There is that possibility.

19 Senator McCaskill. Okay. I know you mentioned, Mr.  
20 Surash, that there have been some contracts that have come  
21 in on top and at budget. But, historically, what percentage  
22 of the contracts would you say have come in at or near the  
23 cost estimate that was given at the beginning of the  
24 contract?

25 Mr. Surash. I just want to check my--ma'am, off the

1 top of my head, I do not have that number, but I will be  
2 happy to provide that.

3 Senator McCaskill. Well, can we do a ballpark?

4 I mean, I would assume that most of the contracts in  
5 this area have not come in at estimate based on our research  
6 we have done.

7 Mr. Surash. Well--

8 Senator McCaskill. The nuclear cleanup contracts.

9 Mr. Surash. If I go back, if I looked at the work--\$6  
10 billion worth of work--done during the Recovery Act time,  
11 2009 to 2011--

12 Senator McCaskill. I am looking at the \$150 billion of  
13 work that has been done since 1990. How much of that?

14 Let's take the stimulus out of it.

15 Mr. Surash. Okay.

16 Senator McCaskill. And, good for you, that those  
17 contracts came in at estimate and on schedule.

18 Let's take that \$6 billion out and do the other \$140-  
19 some billion. How many--what percentage if you had to--and  
20 I will not hold you to this. I am just curious.

21 Are you comfortable in saying that certainly more than  
22 50 percent of them have not come in on estimate, or more  
23 than 70 percent?

24 Mr. Surash. I am just guessing. I will provide the  
25 number for the record, but I was going to say approximately

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EM's early work was largely comprised of extensive characterization of contaminated sites and risks, analysis of cleanup alternatives, level-of-effort landlord activities, and planning for the cleanup work needed at the sites. The first comprehensive estimates of EM's projected cleanup scope, cost, and schedule were developed in the mid-1990s. EM relied mostly on large, site-wide, cost reimbursable Management and Operating (M&O) contracts for cleanup work, until the transition in more recent years to largely non-M&O contracts. Prior to that transition, a cost baseline was generally not established for the contract itself, as it is now. In 1997-1998, EM organized the cleanup work scope into projects, establishing Project Baseline Summaries as a construct to capture programmatic information associated with the cleanup projects, including estimated life-cycle cost, schedule and scope required to complete the projects. Since that period many of the projects were rebaselined, often with changes to cleanup scope due to regulatory agreements or other factors. Therefore, EM does not have comparable data on the actual costs due to the project baseline changes over time.

1 take us to recruit them because our recruitment system is so  
2 efficient here in the Federal Government. It might be 10  
3 years from now before we get the first 200. But how we use,  
4 the contrary is, the people we have working for us.

5 I guess the question is I know when I was mayor, and we  
6 would scope projects. And there was a constant situation  
7 where we had someone who was scoping the project, and the  
8 bids came in much higher than the estimates. That person  
9 did not work for us after a little period of time.

10 So how is internally your operation doing this?

11 Mr. Surash. Yes, sir, let me try to give you a sense  
12 of that. I will talk about--

13 Senator Begich. Let me pause you because I know one  
14 other issue Senator McCaskill and I had when I was on Armed  
15 Services was the F-35, which had questions of its scoping  
16 capacity. And it almost doubled, I think, per unit price,  
17 if I remember right.

18 And they had to make some changes over there from the  
19 top-down, if I remember right--general-down. But that had  
20 never been done before.

21 So I am curious; how is it working

22 Mr. Surash. So let me try to answer it this way, if I  
23 may. I will talk about contracting authority and approval  
24 of a project.

25 So, on the contracting side, our sites--and there are

1 approximately 6 large sites--

2 Senator Begich. Correct.

3 Mr. Surash. --have \$25 million of change authority.

4 So any contract action, whether it is a new contract or  
5 a change, up to \$25 million, they can deal with. That is a  
6 lot.

7 Senator Begich. Cumulative or individual change?

8 Mr. Surash. Each item. That is a lot of--

9 Senator Begich. Cumulative, it could be who knows  
10 what.

11 Mr. Surash. Item by item.

12 Senator Begich. Okay. That is still a lot of money.

13 Mr. Surash. Twenty-five million is a lot of money.

14 Now, in the context of \$5.5 billion, it is a relatively  
15 small amount.

16 Senator Begich. Right, but if it is cumulative and you  
17 can--so you start adding up items.

18 Mr. Surash. Absolutely. My authority is \$50 million.

19 Senator Begich. Mm-hmm.

20 Mr. Surash. Above me, it goes into a Department of  
21 Energy Office of Acquisition and Procurement Management.

22 So, at that point, definitely, the rest of the  
23 Department and our General Counsel, et cetera, you know,  
24 have this ability.

25 Senator Begich. But how is the project originally

1 scoped--because I saw when you mentioned the K-25 it was  
2 \$100 million below the rebaseline.

3 Mr. Surash. Right.

4 Senator Begich. I am just curious; from the original  
5 to the rebaseline, how much difference in cost increase was  
6 that?

7 Mr. Surash. If I--

8 Senator Begich. Because you are basically saving off  
9 of an increase.

10 Mr. Surash. That is true, and that is why I wanted to  
11 be fair when I said that.

12 Senator Begich. How much is that increase?

13 Mr. Surash. Can I--if I may, sir, let me--can I tell  
14 you about the project approval and then answer that, if that  
15 would be okay?

16 Our sites for a project, to approve the baseline--the  
17 baseline is what we are committing to the Congress that we  
18 are going to deliver on.

19 Our site managers have \$100 million of authority. My  
20 Assistant Secretary has \$400 million. Anything above \$400  
21 million is above him. We have a Undersecretary. We have a  
22 Deputy Secretary.

23 And so they have--

24 Senator Begich. Okay.

25 Mr. Surash. They are involved in that.

1           If I may, for the--I will give you very rough numbers,  
2 but I can, for the record, give you the exact numbers.

3           Senator Begich. That would be great.

4           Mr. Surash. For that K-25 project, I believe it was  
5 about \$500 million original baseline cost, circa 2008.

6           Senator Begich. Mm-hmm.

7           Mr. Surash. And the rebaseline was approximately \$1.3  
8 billion.

9           So I mean, again, to be fair, I said that we are three  
10 or four

11          Senator Begich. Let me pause you there.

12          Mr. Surash. Yes, sir.

13          Senator Begich. Who did the original baseline?

14          That is what I am trying to get to because here is my  
15 question; we do not have a good habit in the Federal  
16 Government.

17          I mean, I will not get on my CBO rant, but they are  
18 always off 20 percent, which--I do not know--is a couple  
19 hundred billion a year on the deficit.

20          But, you know, it seems around here \$200 billion seems  
21 to be small change according to some people, not to me, but--  
22 -so who does the original scoping to develop the baseline?  
23 Is that internal?

24          Mr. Surash. The way this would work is it starts with  
25 the contractor. That is who is doing the work.

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The original baseline of the K-25 project was \$479.4M cost and September 2017 completion date. The subsequent revised baseline of the K-25 project had a cost of \$1.397B and a revised schedule for completion of December 2015. This baseline change was approved on November 31, 2011. We expect the project will be completed approximately \$300M below the revised baseline cost.

1 there is we actually have a pilot-scale plant that has been  
2 in operation for several years that is using the exact  
3 technology that this much larger, billion-dollar-plus plant  
4 is going to use.

5 So that is an example of the sorts of things that we  
6 should do.

7 Senator McCaskill. Okay. So you are getting--you  
8 understand this is a problem, and you understand this is an  
9 issue, and you understand the investment in small-scale will  
10 pay for itself multi-times over rather abandoning something  
11 that you go to large scale without the proper small-scale  
12 test.

13 Mr. Surash. Absolutely, and this is part of this tug  
14 on getting on with work versus doing it right.

15 A pilot plant will actually cost a little bit more  
16 money up front. It will take more time. But we have  
17 learned the hard way for the first-of-a-kind nuclear, very  
18 complicated projects that we really need to do this or else  
19 we are asking for trouble and we are rolling the dice down  
20 the road.

21 Senator McCaskill. Do you believe, Mr. Friedman, that  
22 they are doing better on this front?

23 Mr. Friedman. I think, frankly, there have been a  
24 number of actions which I think are admirable and which we  
25 certainly agree with in seeing from our history, but I think

1 the jury is out. We are going to have to wait and see. I  
2 cannot--at this point, I cannot give you confirmation of  
3 that.

4 Senator McCaskill. The number of prime contractors--I  
5 want to make sure I understood your testimony correctly. We  
6 are not seeing a shrinkage; we are actually seeing an  
7 increase?

8 Mr. Surash. We have seen a little bit of an increase,  
9 and I would say mainly on the smaller contractors. Off the  
10 top of my head, I cannot think of a very large new firm that  
11 has entered the picture.

12 If I am mistaken, I will provide--

13 Senator McCaskill. And what about subs?

14 Mr. Surash. Ma'am, our privative contract, as you are  
15 aware, is with the prime contractors. There seems to be--I  
16 am not aware of issues with lack of subcontractors or lack  
17 of competition. So that seems to be going okay.

18 In some cases, you know, for instance, the Oak Ridge  
19 project I was talking about before, the way we structured  
20 that is we wanted 60 percent of the work to be done by  
21 subcontractors, and that seems to be working out relatively  
22 well.

23 Senator McCaskill. You know what is interesting to me  
24 is, having spent so much time in the defense space, you have  
25 a wealth of competitors compared to some space at DoD. A

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We have reviewed the number of potential offerors who have shown interest in Environmental Management's (EM) acquisitions over the last three years. From this we have been able to show the average per procurement has remained steady.

Contractors typically form Limited Liability Corporations (LLC) for our larger projects. Over the past 10 years, the major partners in those LLCs have remained stable, generally comprised of offerors such as Babcock and Wilcox, Bechtel, and CH2M Hill. There have been a few smaller prime contractors that have entered the picture in this time such as Portage. Reviewing these numbers has shown they have stayed relatively the same over this duration.

1 contract awarded in 2000. And what I want to point out  
2 there is that was for a plant that would operate for 40  
3 years and treat about 40 percent, by volume, of the  
4 radioactive waste out there.

5 The plant today will treat 100 percent of the high-  
6 level waste, 40 percent of the low-level waste and operate  
7 for 50 years. So that is partially the reason for this cost  
8 growth. We actually are increasing the scope of what can be  
9 provided.

10 To answer your question on the waste treatment plant,  
11 that is currently a single contract still today. It was  
12 originally awarded in 2000.

13 Senator Johnson. Okay. It is Hanford where we are  
14 actually getting leakage right now, too, isn't it?

15 Mr. Surash. That is correct. That is--actually, there  
16 is a separate contractor that is managing the underground  
17 tanks where we have some suspected leaking tanks.

18 Senator Johnson. That is definitely heightening the  
19 concern in trying to--everybody is trying to speed this  
20 process up to address that fact.

21 Mr. Surash. Yes, sir, absolutely.

22 Senator Johnson. Let's go to the Safety Board a little  
23 bit in terms of its impact on cost and scope and those types  
24 of things.

25 Mr. Bader, in the Safety Board's recommendations, is

1 there any cost-benefit analysis done to your  
2 recommendations?

3 Mr. Bader. There is not.

4 Senator Johnson. What guides your recommendations  
5 then? Strictly, public safety?

6 Mr. Bader. First of all, we look at the public safety  
7 and try and be sure that there is adequate protection. In  
8 doing that, we consider the technical and economic  
9 feasibility but do not do a cost-benefit analysis.

10 Senator Johnson. Mr. Surash, has any recommendation  
11 from the Safety Board ever been turned down or pushed back,  
12 or let's say first, turned down?

13 Mr. Surash. Sir, that is a little bit out of my area  
14 of expertise, but I can provide that for the record. There  
15 may have been.

16 Mr. Bader may--

17 Senator Johnson. Mr. Friedman, are you aware of any  
18 recommendations from the Safety Board being turned down?

19 Mr. Friedman. I do not know specifically, Senator.

20 Senator Johnson. So--

21 Mr. Friedman. I do not know one way or the other.

22 Senator Johnson. Okay. It would be my concern if you  
23 have a Safety Board. Again, I think we are all concerned  
24 about safety, but if they are operating outside any kind of  
25 cost-benefit analysis, one of my concerns--I know in Idaho

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There has not been any instance of DOE rejecting or turning-down a DNFSB recommendation in its entirety. There have, however, been three instances where a DNFSB recommendation has been partially accepted.

1 one project was the Idaho National Laboratory.

2 I know a Safety Board recommendation was to take into  
3 account a seismic event, and so that project was stopped  
4 dead for at least a year and a half to basically redesign a  
5 plant that was scheduled, I think, to operate for 18 months.

6 Now I believe those were tanks that were there, that  
7 have been sitting there for decades, also certainly at risk  
8 in terms of seismic events, but now we are going to clean it  
9 up, hopefully, in the span of about 18 months.

10 And then the Safety Board recommends, no, we have got  
11 to include all this rebar, all these construction codes,  
12 construction techniques, to really prevent damage in a  
13 seismic event.

14 Is that part of the problem there?

15 Mr. Surash. Sir, if I can answer, that actually  
16 happened at the integrated waste treatment plant in Idaho  
17 that you were mentioning. We came across that on the salt  
18 waste processing project and also the waste treatment plant.

19 And this--the root of all this has to do with this  
20 proper up-front planning. You know, we really need to  
21 mature the design, work with regulators and oversight  
22 organizations before we start building. But we did not, and  
23 what you--happened, you know, is accurate.

24 Senator Johnson. Do you know what the cost of that was  
25 in terms of reinforcing that building for seismic events?

1           Mr. Surash. I will provide a very accurate number for  
2 the record, sir. It was--

3           Senator Johnson. Ballpark?

4           Mr. Surash. Just a wild guess, maybe \$20 million or  
5 \$30 million.

6           Senator Johnson. Okay. Well, unfortunately, in the  
7 scheme of things, that is not that big a number in terms of  
8 what we are spending.

9           Mr. Bader, do you want to comment on that?

10          Mr. Bader. We did not make a recommendation. We had a  
11 letter, which we would call a project letter, which was  
12 issued. And, actually, if you would like us to submit it  
13 for the record, I have a copy here.

14          And we were actually largely in agreement with the  
15 project through DoE on the seismic requirements.

16          Senator Johnson. Okay. I guess maybe I should ask you  
17 this question; are there any safety recommendations that you  
18 made that DoE has either pushed back on or simply declined  
19 to enact?

20          Mr. Bader. There was one recommendation which was  
21 partially rejected by the Secretary but which he said he  
22 would actually respond in his implementation plan in a  
23 manner that would meet our concerns.

24          Senator Johnson. Out of how many recommendations have  
25 you put forward since your establishment--a ballpark?

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The actual cost impact for changing the design basis of the project from Performance Category (PC) 2 to PC 3 was \$130 million, inclusive of cost increases due to schedule delays. The \$130 million impact represents the cost of the Performance Category (PC) 2 to PC-3 design and construction cost, and the one year plus delay.

It is important to note that the decision to change the design basis to PC 3 was made before establishing the original cost baseline of the project of \$461.6 million and included approximately \$100 million for moving from PC2 to PC3. The primary driver behind DOE's decision to go from PC 2 to PC 3 was to build into the IWTU facility, an additional capability to support future modification of the facility to process calcine waste. This decision was made to avoid the cost of building an entirely new facility for calcine, and smartly re-use the IWTU facility which was only planned for a 10 month production run.

Also, important to note is that when a revised project baseline of \$550.9 million was approved in December 2008, \$30 million of the approximately \$89 million cost increase was due to PC 3 design and structural complexity.

**Post-Hearing Questions for the Record  
Submitted to Michael Graham  
From Senator Claire McCaskill**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. The Department of Energy has been on GAO’s high risk list for its contract management for over 20 years. The Department’s projects have had chronic cost overruns and schedule delays.

Q: What do you think the impact of bringing more oversight to the management of your contracts would be?

*EM contracts already involve multiple layers of oversight. Oversight more closely coordinated with project objectives could improve capital project outcomes.*

Q: Would it be worthwhile for the Department to obtain more independent cost estimates of its projects?

*Independent Government Cost Estimates (ICEs) are an important tool that should be, and have been employed in the capital project management process. With regard to the WTP project, the Department had an ICE prepared that served as the foundation of the initial contract price and subsequently employed the Corps of Engineers to prepare an ICE when the project was rebaselined in 2006.*

Q: Have you ever felt any pressure, direct or indirect, from the Department to keep cost estimates or bids beneath what you felt the true cost of the project would be?

*We have worked closely with the Department regarding development of project baselines for the projects on which we work and have, in accordance with DOE Order 413, always sought to assure that the management reserve held by the contractor and the contingency held by the Department reflected an appropriate estimate of project costs.*

2. It appears that Environmental Management (EM) contractors cooperate as much with other firms on joint ventures as much as they compete with them for contracts. The industry has coined a term, “competimates,” to describe this relationship.

Q: Why shouldn’t this level of cooperation raise eyebrows among taxpayers who expect strong competition between contractors?

*In most cases, a single contractor organization does not have the requisite skills and experience to provide best value to the government for the wide range of tasks involved in major EM activities. Teaming with other contractors allows EM to obtain the best talent most efficiently. EM obtains the benefits of competition in the contracting phase when various contractor teams compete against each other for the business. We believe that DOE receives the benefit of strong competition as a result of these arrangements.*

The Department is moving to first consider firm-fixed-price contracts in the future, rather than the cost-plus contracts in use today.

Q: Would you have bid on a firm-fixed-price contract on any of your current major EM projects?

*Yes, if properly structured to provide the contractor a firm basis for preparing its price. However, with the unknowns associated with many of these projects at the outset, it would have been difficult to properly structure such a contract for our current projects for EM. In this regard, we note that Performance of the Defense Acquisition System, 2013 Annual Report. Washington, DC: Office of the Under Secretary of Defense, Acquisition, Technology and Logistics, 2013, dated June 28, 2013, recently concluded among other things that the fixed priced type of contract is not necessarily better at controlling cost growth.*

Q: Is EM realistic in considering firm-fixed-price contracts for remediation work?

*Firm fixed price (FFP) work must be clearly scoped. Remediation work can involve many unknown elements. The greater the uncertainty, the less appropriate it is to use the FFP contracting model.*

3. Part of the reason the Waste Treatment Plant has incurred significant cost overruns is because designs and plans related to safety were incorporated only after construction had begun.

*This statement is inaccurate. There has been cost growth as a consequence of changes to scope and funding which are different than a cost overrun. Design was initiated with safety criteria based on known industry practice and government-provided information on waste feed. That information has been revised over time. In establishing the contract structure, DOE determined that a design-build program was the only approach that had the possibility of meeting the Department's binding commitments to the State of Washington. The design-build approach has an acknowledged risk of cost growth if changes are made.*

Q: Do you think some of these safety issues could have been addressed sooner and at lower cost if the Defense Nuclear Facilities Safety Board ("Safety Board") had been included earlier in the process?

*We know of no impediments to DNFSB's participation in the development of the WTP.*

According to the GAO, since 2009, Bechtel has been awarded \$15.6 million in incentive fees just for meeting schedule and cost goals, even though the Waste Treatment Plant's schedule has slipped and construction costs have increased.

Q: How did Bechtel justify the receipt of these incentive fees despite the cost overruns and schedule slippages of the Waste Treatment Plant?

*We believe that the fees at issue had been earned relative to the criteria in the contract. Since 2009, until the Department decided to place part of the project on hold in 2012, WTP project performance has been on schedule and on cost. The Department awarded fee to Bechtel based on its determination of contract performance based on criteria that were added to the contract in 2009. Scope growth beyond the bounds of the contract, funding inconsistencies, delays, and reevaluation of technical decisions have resulted in cost growth and schedule extension.*

CH2M HILL Response to Questions for the Record

**Post-Hearing Questions for the Record  
Submitted to Michael McKelvy  
From Senator Claire McCaskill**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. **The Department of Energy has been on GAO’s high risk list for its contract management for over 20 years. The Department’s projects have had chronic cost overruns and schedule delays.**

**Q: What do you think the impact of bringing more oversight to the management of your contracts would be?**

CH2M HILL believes that DOE has the resources and procedures in place to conduct efficient contract management of its EM programs and projects, setting both performance and partnering expectations, contractor accountability for cost growth, and DOE responsibility for tailored, effective oversight. Adding more government oversight requirements to existing contracts typically increases costs and decreases efficiencies in project practices. In our experience, the mutual success of the government and contractor on performance-based incentivized contracts is achieved through “effective” rather than “more” oversight. Effective oversight requires significant up-front planning and clear government and contractor partnering for delivery of mutual contract objectives. In our experience, contractors desire to work within reasonable and equitable contract terms and be incentivized to safely, efficiently and effectively deliver work.

A successful oversight model not only elevates a balanced focus on management and performance, but helps to build a collaborative approach between the DOE and the contractor in enhancing the enterprise-wide approach to planning and execution. Effective oversight would allow DOE to focus on setting the objectives and standards to be met, while allowing the contractor flexibility as to how to accomplish work. This enables DOE to more clearly assess performance and hold contractors accountable for results. DOE is also able to attract and reward the best high-value professionals and companies resulting in more predictable performance. We support improvements in effective oversight and feel both the contractor and government should be accountable for contract success, but do not believe more oversight is the solution for cost overruns and schedule delays.

**Q: Would it be worthwhile for the Department to obtain more independent cost estimates of its projects?**

Consistent with the recent testimony “Observations on Project and Program Cost Estimating in NNSA and the Office of Environmental Management” dated May 8, 2013, we agree there are opportunities for improving the confidence in capital cost estimates and operating budgets. From our perspective, and due to the unique nature of the DOE-EM scope, including but not limited to the technical and regulatory uncertainty, more “independent” cost estimates are not necessarily the answer. Rather, a greater emphasis on consistency in

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the structure and scope of the contractor's proposed estimates, comprehensive risk and uncertainty analysis, and conducting sensitivity analyses are more likely to improve overall estimate accuracy and confidence in contractor and DOE budgets.

**Q: Have you ever felt any pressure, direct or indirect, from the Department to keep cost estimates or bids beneath what you felt the true cost of the project would be?**

There is always a strong joint DOE and contractor interest to control costs and stay within established contract funding levels but we do not feel pressured, directly or indirectly, to misrepresent cost estimates or projections.

2. **It appears that Environmental Management (EM) contractors cooperate as much with other firms on joint ventures as they compete with them for contracts. The industry has coined a term, "competimates," to describe this relationship.**

**Q: Why shouldn't this level of cooperation raise eyebrows among taxpayers who expect strong competition between contractors?**

The overall nuclear supply chain for the DOE-EM cleanup market has a very limited number of companies with the capabilities to efficiently and effectively execute the work. On the large and complex cleanup sites, two or more companies sometimes come together to form a joint venture and act as a single potential prime contractor providing diversity in corporate skill sets and bringing value to the DOE in the form of greater corporate reach back for project support. By bringing together the best contractors and coordinating their contributions to program and project activities, joint ventures achieve cost efficiencies and schedule adherence with ongoing verification of quality that single entities or small businesses may not be able to achieve. In short, partnering provides dependability and ensured responsibility to the DOE in managing the rapid changes in resource requirements and schedule that are encountered during various stages of complex, broad scopes of work. The Federal Acquisition Regulation (FAR) Subpart 9.6 recognizes contractor team arrangements may be appropriate and desirable because they "(1) Complement each other's unique capabilities; and (2) Offer the Government the best combination of performance, cost, and delivery for the system or product being acquired." Additionally, large firms like CH2M HILL participate in the DOE Mentor Protégé program to develop capable subcontractors, who in turn add competition into the cleanup market for increased value to the taxpayer.

3. **The Department is moving to first consider firm-fixed-price contracts in the future, rather than the cost-plus contracts in use today.**

**Q: Would you have bid on a firm-fixed-price contract on any of your current major EM projects?**

The majority of our large DOE-EM contracts are cost reimbursable with performance-based incentives, based in part because of scope, cost, and schedule risks and uncertainties. By comparison, we could not have bid any of our current major DOE-EM projects without material changes in contracting terms and conditions and significant increases in estimate contingency because of the uncertainty of the work scope and requirements. Firm-fixed-

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price contracts are only appropriate when scope, requirements and performance risk are well defined.

**Q: Is EM realistic in considering firm-fixed-price contracts for remediation work?**

CH2M HILL, along with the other Energy Facility Contractors Group (EFCOG) members, concluded that fixed-priced contracting for large scale DOE-EM cleanup projects or first-of-a-kind waste treatment projects might be considered with additional, extensive, up-front scope and design definition, firm regulatory requirements, clear risk analysis and ownership, strict avoidance of directed changes, and a commitment to multi-year, stable funding. Meeting these significant and challenging prerequisites, including accurate and comprehensive site characterization, would bound risk and contingency and theoretically enable fixed-pricing of new contracts for remediation work, just like any other project scope. A significant challenge in setting firm-fixed-price contracts for large and complex DOE-EM projects is the uncertainty in funding and changing priorities due to the high number of stakeholders with competing needs and the changing site dynamics. It is important to note that we do not believe DOE-EM could effectively modify existing cost-reimbursable DOE-EM contracts to fixed-price without an increase in price.

**4. The clean-up of the Rocky Flats site was completed on time and on budget.**

**Q: Why was this project able to reach a successful completion while so many of EM's other projects were not?**

Rocky Flats was considered the most complex environmental cleanup project completed in U.S. history. It was the first large nuclear-weapons facility to be decommissioned and closed anywhere in the world. This high-hazard project was completed within strict safety and environmental parameters 56 years ahead of original government estimates, and 14 months in advance of our own aggressive schedule. The final cost was more than \$29 billion less than original 1994 U.S. government estimates. The aggressive plan to close the site in 10 years and for a total estimated cost of approximately \$7 billion required an end-state vision agreed upon by Congress, DOE, the regulators, and all affected stakeholders. The success of the Rocky Flats Closure Project was a result of many factors, including the development of a strong collaborative partnering process between Kaiser-Hill Company (KHC) and DOE that established credible, positive relationships with local citizens, the regulatory and business communities, and the workers, and resulted in a unified end state vision. Identification of interim or final end state in the contract provided clear direction and, more importantly, set the stage for both contractual and technical innovation in achieving closure. Beyond any specific innovation, it was through unparalleled cooperation among the interested parties that a conservative and compliant cleanup and closure of Rocky Flats was enabled, ahead of schedule, under budget, and with an exceptional safety record.

**Q: What, if anything, was different about the way the Department managed this project, and how can it be repeated?**

The challenge of repeating the same success as Rocky Flats, Miamisburg Closure, and Fernald Closure projects at the current cleanup projects is that the existing sites have ongoing

## CH2M HILL Response to Questions for the Record

missions. However, all three completed closure programs offer experience and lessons learned directly relevant to the ongoing DOE-EM efforts, including socio-economic implications, community and regulatory collaboration, end state options, workforce retraining and re-employment, and regional considerations which ultimately manifest themselves in a series of choices to create a successful completion. Building a successful project model and workforce that embraces the attainment of cleanup outcomes requires two key inputs: (1) a clear end-state vision with associated criteria that define its economic, social, and environmental underpinnings; and (2) a relentless commitment to apply the basic tenants of schedule, cost and quality every day and as part of every decision made by every team engaged in the project.

In addition to collaborative working relationships, the success of Rocky Flats was achieved through defined roles and responsibilities, partnering and effective oversight. The DOE Rocky Flats Field Office managed to the contract and not the work, which allowed KHC to work safely and compliantly in accordance with clearly defined contract requirements.

Establishing a performance-based approach to contracting and incentivizing contractor execution and completion of work, consistent with clearly established performance expectations, was the first step in setting the stage for successful contract management by DOE. It is also important to note that it took several years to develop site characterization sufficient enough to establish a credible and achievable baseline and scope of work needed to achieve the vision and the regulatory end points. Success at Rocky Flats relied on a series of innovative, high-risk strategies in regulatory reform, contract reform and strategic orientation and planning. Rocky Flats developed and maintained a credible project plan and demonstrated steady progress towards closure, which gave Congress and the political leadership of DOE the confidence to provide steady funding for the project and provide the support needed to keep the project on track.

5. **The DOE IG reported that at the Richland Remediation project, CH2M Hill did not notify EM until October 2010, more than 18 months after the EM deadline, that the cost for the Plateau Remediation contract would increase by over \$500 million.**

**Q: Why did CH2M Hill take so long to notify EM of this change?**

Given the size, complexity and interrelated nature of the scopes and cost increases, the normal timeframe for submittal was not achievable for the Plateau Remediation Contract. CH2M HILL agrees 18 months is too long a period for a definitive alignment of estimates, but PRC did pose a unique and unforeseen cost estimating challenge. During the contract transition and early execution period, identified material differences, DOE directed Changes, significant ARRA scope additions as well as regulatory decisions and other items affecting cost were experienced simultaneously. The interrelated nature of the scope and cost increases required extensive estimating and planning. During the estimate development period, the estimate basis was evolving as actual costs were incurred and cost and pricing information were required to be updated accordingly. CH2M HILL kept DOE apprised of its estimate developments with interim submittals and maintained baseline control during this period. In October 2010, CH2M HILL submitted a formal reconciliation (~\$500m notification referenced above) estimate to DOE of the increases that were due to either scope maturity,

## CH2M HILL Response to Questions for the Record

regulator decisions since award, unaccepted technical approach(es) and/or cost increases. In summary, during the period 2008-2010, CH2M HILL and DOE did struggle with managing and segregating complex changes to the Contract and accurately assessing the impact of all cost increases within the baseline and contract. We worked with DOE throughout the process and dealt with modifications and changes to come up with a definitive number.

6. **Earlier this year, CH2M Hill entered into a settlement with the Department of Justice for time card fraud at Hanford. For years, employees falsified time cards. Under the settlement reached with the Department of Justice, CH2M Hill admitted that certain members of management knew about the employee time card fraud at the time it was ongoing.**

**Q: Are any of the supervisors, management, or officers who were aware of this fraud at the time it was ongoing still working at CH2M Hill?**

CH2M HILL Hanford Group, commonly known as "CHG" ( a wholly-owned entity of CH2M HILL) held the nuclear operations contract at the Hanford High-Level Waste Tank Farms until 2008, at which point the contract was awarded by DOE to Washington River Protection Solutions, LLC, commonly known as "WRPS" (a URS Corporation and Energy Solutions joint venture). Therefore, our response is limited to those employees involved in the matter and previously retained by CH2M HILL, Inc. or CH2M HILL Plateau Remediation Company (CHPRC).

Two CH2M HILL managers were suspended from duty at the time they were indicted earlier in 2013, and have been removed from their DOE-EM roles until the Department of Justice investigation is complete and the matter resolved.

Should CH2M HILL become aware of any other employees who were involved, or alleged to be involved, in the time card fraud we will take appropriate action in accordance with our company's personnel policies.

**Post-Hearing Questions for the Record  
Submitted to Frank Sheppard, Jr.  
From Senator Claire McCaskill**

**“Contract Management by the Department of Energy”  
June 27, 2013**

1. The Department of Energy has been on GAO’s high risk list for its contract management for over 20 years. The Department’s projects have had chronic cost overruns and schedule delays.

Q: What do you think the impact of bringing more oversight to the management of your contracts would be?

A. The current amount of DOE oversight is more than adequate to protect the Government’s interests. Providing more management oversight could be counter-productive and possibly create more inertia. Focusing more on the proper level of oversight and on critical budget and schedule sensitive issues would be more meaningful and productive.

Q: Would it be worthwhile for the Department to obtain more independent cost estimates of its projects?

A. Not necessarily more independent cost estimates, but rather ensuring that the correct cost factors associated with first-of-a-kind projects be considered and that adequate contingency be included in the estimates. Establishing a truly independent cost analysis group that does not answer to the program may help ensure that requirements and risks are adequately identified and maintained in the cost estimate.

Q: Have you ever felt any pressure, direct or indirect, from the Department to keep cost estimates or bids beneath what you felt the true cost of the project would be?

A. We always provide estimates of what we believe the true cost of the project will be. There have been instances where the Department’s position is below what we have felt the true cost of the project to be. While the Government and contractors work hard to provide value for the taxpayers, these complex first-of-a-kind projects are very difficult to estimate and unpredictable given the state of the nuclear supply chain.

2. It appears that Environmental (EM) contractors cooperate as much with other firms on joint ventures as much as they compete with them for contracts. The industry has coined a term, “competimates,” to describe this relationship.

Q: Why shouldn’t this level of cooperation raise eyebrows among taxpayers who expect strong competition between contractors?

A. EM projects are bid by a small, very technical and highly specialized community of contractors where both competition and cooperation are critical to successful program

execution. While there is a relatively small group of large companies that have performed DOE-EM work, Government technical requirements drive team composition for each solicitation. When the decision is made to team, it is usually to leverage the capabilities of the teaming partners to ensure success on the project. Even after a teaming decision is made, there is still adequate technical and cost competition available from the remaining contractors to ensure a healthy, competitive environment.

3. The Department is moving to first consider firm-fixed-price contracts in the future, rather than the cost-plus contracts in use today.

Q: Would you have bid on a firm-fixed-price contract on any of your current major EM projects?

- A. It is highly doubtful that we would bid a firm-fixed price EM contract after careful consideration of the risks involved and the likelihood of success. Bidding on a firm-fixed-price major EM project entails taking extraordinary risk and there is tremendous uncertainty inherent in both complex large nuclear construction projects and major environmental cleanup work.

Q: Is EM realistic in considering firm-fixed-price contracts will for remediation work?

- A. Employing a firm-fixed price approach requires a complete design with specifications that clearly describes the scope of work to be performed. For EM sponsored remediation work there typically is no design or set of requirements. These contracts are typically structured to frame the extent of the contamination (through characterization) and then define an end state. It is then up to the contractor to achieve the end state in the most efficient manner. A firm-fixed price design-bid-build or design-build approach would not work without a contractor including significant contingency to compensate for unknowns. Typical EM remediation projects do not have adequately and accurately defined and bounded scopes of work that provide confidence in the cost estimate to successfully complete them. This approach may be more suitable for much smaller remediation contracts where the scope of work can be well defined, the level of characterization is mature and costs are more reasonable.

4. The Salt Waste Processing Facility is currently estimated to cost about \$1.2 billion. According to the GAO, an independent estimate by the Department's Office of Cost Analysis extrapolated data from a similar project and determined the Salt Waste Processing Facility would cost \$2.7 billion.

Q: Was Parsons aware of this independent cost estimate and did it attempt to reconcile the independent estimate with its own?

- A. Parsons was aware of the independent cost estimate by the Office of Cost Analysis cited in the GAO report. Parsons' review of this independent estimate concluded that it contained numerous factual inaccuracies regarding the project technology and design status that severely limited its relevance. The actual cost and schedule issues experienced by the SWPF project were due to criteria revisions, supply chain failures to achieve nuclear quality requirements and subsequent funding constraints. They were not related

to the assertions regarding technology and design risks that drove the Office of Cost Analysis estimate.

Q: Does Parsons reconsider its own estimates when presented with significantly different independent estimates?

A. Parsons has reconsidered our own estimates relative to other significantly different independent estimates and normally would reconsider its estimates when presented with a significantly different independent estimate.

5. The Department's Office of Enforcement and Oversight found that Parsons and the Department have an "adversarial relationship" at the Salt Waste Processing Facility project site.

Q: What does the Department need to do to improve its relationship with its contractors?

A. DOE has adopted a "Partnering" approach to improve relations on the SWPF project. The key to success on any large project is effective communications. "Partnering" is designed to ensure effective two-way communications to ensure a project progresses to completion smoothly and with minimum disruptions. In the future, implementing "Partnering" at the onset of the project would do much to ensure there is a positive relationship at the very start of the project. "Partnering" provides an opportunity to discuss and develop mutually acceptable approaches to how the project can be managed to ensure success.