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OVERSIGHT ON THE NUCLEAR REGULATORY COMMISSION

HEARING

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

ONE HUNDRED TENTH CONGRESS

FIRST SESSION

APRIL 25, 2007

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ONE HUNDRED TENTH CONGRESS
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OVERSIGHT ON THE NUCLEAR REGULATORY COMMISSION

WEDNESDAY, APRIL 25, 2007

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 o'clock a.m. in room 406, Dirksen Senate Office Building, the Hon. Thomas R. Carper (chairman of the subcommittee) presiding.

Present: Senators Carper, Clinton, Inhofe, Sanders, Voinovich.

Senator CARPER. Good morning. I welcome our Chairman and Commissioners this morning. I welcome my colleagues, Senator Inhofe and Senator Sanders. We may be joined, I suspect, by most of the members of the subcommittee, and some are not.

Before we begin today, I would like to address a couple of procedural matters. We are currently scheduled to have a vote around 11 o'clock a.m. I would like for us to proceed with the hearing and see how far we can get before we have that vote. I think it is only one vote, and we will reconvene after the vote if necessary, so Senators can continue asking questions and the Commissioners can continue answering them.

The chairman seeks short, direct responses, but I can't promise that the questions will be short, but hopefully we will both keep some economy in our words.

Senators will have 5 minutes for their opening statements, and we will be following the early bird rule with respect to member statements.

I will recognize Chairman Klein for his 5 minute testimony, and each of our other Commissioners for 3 minutes to share their views. When we get into our questions, we will have 7 minutes for those rounds of questions.

Before we begin today, I just want to acknowledge the service of one of our Commissioners, Commissioner Merrifield. I said, who nominated you to serve on the Commissioner? Who did you tell me?

Mr. MERRIFIELD. Senator Chafee.

Senator CARPER. Senator Chafee. I said, well, what President nominated you? He said it was President Clinton. So we thank them both for nominating you and sending your name to the Senate for consideration. Nine years, that is a long time. I understand you will be serving until the end of June. We are grateful on behalf of the committee, and on behalf of, really, our country, thank you for your service and for your service over the next couple of months. You are still on the payroll so we expect a whole lot out

of you. As it turns out, there is a lot for the commission to do, as you know.

Mr. MERRIFIELD. Thank you very much, Senator Carper.

Senator CARPER. Thank you.

Not long ago, and I don't know if my colleagues on the committee know this, but the NRC was designated as the best place to work in the Federal Government. I said to my staff, it is probably because they didn't include our offices in that discernment, but that is a terrific recognition. I would applaud the Chairman and the Commissioners. I applaud your predecessors as well, and the members of your team for the work that they have done to make that kind of recognition possible.

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. Today's hearing continues our ongoing oversight of the Nuclear Regulatory Commission. I am privileged to be Chairman of this subcommittee and privileged to follow in the footsteps of my friend George Voinovich, who is our Ranking Member, and before him, Senator Jim Inhofe, and to hold regular hearings to review the NRC's activities.

Earlier this year, I met with Senator Voinovich to discuss our plans for this subcommittee. We developed a very extensive oversight agenda to ensure that the industry and the Nuclear Regulatory Commission are prepared for the challenges and for the opportunities that lie ahead.

The issues that we will focus on this year as a subcommittee include the following ones: No. 1, new reactor licensing; and No. 2, ensuring that the NRC has the human capital necessary to fulfill its mission. For any of you who know George Voinovich, you know that that is something that is of prime interest to him. No. 3 is nuclear security regulation; No. 4, reactor safety; and No. 5, nuclear waste solutions.

Let me just talk a moment about each of those. First of all, new reactor licensing. The NRC anticipates receiving somewhere between 5 to 7 combined operating license applications before the end of this year, and another 10 to 12 during calendar year 2008. We want to be sure that the commission is prepared to process these applications and do so in a way that is timely and do so in a way that always promotes safety.

Second is to ensure that the NRC has the human capital necessary to fulfill its mission. I am told that more than one third of the NRC's workforce will retire in the next few years, and a couple in the next few months. We want to say that that happens at the same time that the NRC's responsibilities are expanding once again. We intend to closely monitor the NRC's efforts to hire new employees and the Agency's plan to train these new hires. We want to be helpful to make sure you get the best and the brightest.

No. 3 was nuclear security regulations. Earlier this year, the commission issued new security requirements for the civilian fleet. In addition, yesterday the commission proposed adding plane crash security assessments to new reactor designs. I intend to hold a secure briefing for members of this subcommittee and other members of our committee who would like to participate in the coming weeks

to discuss these security regulations in greater detail than we can discuss here in this forum today.

No. 4, nuclear reactor safety. I want the people of Delaware, the people of Vermont, Oklahoma, Ohio and other States across the country, I want us all to be safe. It is the NRC's job to ensure that that happens. I support the commission and nuclear industry as you plan for a nuclear renaissance, with new plants coming on line. However, we must continue oversight of existing plants and ensure that they perform at a high level of excellence.

It is our goal to ensure that the NRC addresses the shortcomings highlighted by GAO last year in the reactor oversight process, and enable the commission to fulfill its responsibilities and to instill public confidence.

With respect to nuclear waste solutions, let me just say that there are other countries that use nuclear power more extensively than we do. We might have the opportunity to learn from them what they do with their nuclear wastes, and to bring others to us, to speak to us and share with us their counsel for what we might do to dispose of our nuclear waste in a safe way as we try to think outside the box.

Again, I want to thank Chairman Klein and the other Commissioners for coming here today and helping us in discussing these and other issues. We look forward to your testimony and to working with our colleagues.

With that having been said, let me yield to Senator Inhofe, and to welcome him. Thank you for joining us today, and for your leadership of this subcommittee and committee.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Welcome, I appreciate the Chairman and several of the Commissioners effort to be with us today.

Before we begin, I want to acknowledge Commissioner Merrifield. While I intend to hold several more oversight hearings this Congress, this may be the last opportunity Commissioner Merrifield has to appear before us, and I want to acknowledge and thank you for your service.

I know you and the Commissioners are dedicated public servants, and I want to take this opportunity to thank you for your service to our country.

Your job is not easy, it takes you away from family and friends, and it involves an area of great responsibility—regulating the Nation's civilian use of nuclear materials.

The NRC recently was designated the "Best Place to Work" in the Federal Government. That is an award to be proud of, and it is a testament to the personal leadership and management of each of you on the Commission. Good job and congratulations.

Today's hearing continues our ongoing oversight of the Nuclear Regulatory Commission (NRC). As the Chairman of this subcommittee, I intend to continue the tradition of Ranking Member George Voinovich, and before him Senator Jim Inhofe, to regularly hold hearings to review the NRC's activities.

Earlier this year, I met with Senator Voinovich to discuss our plans for this subcommittee, and we developed a very extensive oversight agenda to ensure the industry and the Nuclear Regulatory Commission are prepared for the challenges and opportunities ahead.

The issues we will focus on are:

1. New Reactor Licensing: The NRC anticipates receiving 5 to 7 combined operating license applications before the end of the year, and another 10 to 12 during calendar 2008. We want to be sure the Commission is prepared to process these applications.

2. Ensuring the NRC has the human capital necessary to fulfill its mission. More than ⅓ of the NRC's workforce will retire in the next few years—at the same time that the NRC's responsibilities are expanding.

We intend to closely monitor the NRC's efforts to hire new employees and the agency's plans to train these new hires.

3. Nuclear Security Regulations: Earlier this year the Commission issued new security requirements for the civilian fleet. In addition, yesterday, the Commission proposed adding plane crash security assessments to new reactor designs. I intend to hold a secure briefing for the Subcommittee in the coming weeks to discuss these security regulations in detail.

4. Reactor Safety: I want the people of Delaware and across the country to be safe, and it is the NRC's job to ensure that happens. I have supported the Commission and the nuclear industry as they plan for a "nuclear renaissance" with new plants coming online.

However, we must continue oversight of existing plants, and ensure they perform at a high level of excellence. It is our goal to ensure that the NRC addresses the shortcomings highlighted by GAO last year in the Reactor Oversight Process, and enable the Commission to fulfill its responsibilities and instill public confidence.

The public must have confidence the current fleet and any new reactors are being held to the highest standards. Again, I thank Chairman Klein and the rest of the Commissioners for coming here to discuss these issues. I look forward to their testimony and to working with my colleagues.

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. Thank you, Senator Carper.

It is hard for me to believe that it was 10 years ago this year that I had the chairmanship of this subcommittee. At that time we had gone for about a decade without any kind of an oversight hearing. I think a lot of times you guys don't like to be referred to as a bureaucracy, but it is. It is impossible for any bureaucracy to go without oversight for a long period of time.

So we started those and we actually put in goals, things that would happen in a certain period of time, and they did. So I think that has worked real well. The ranking that you have achieved that was referred to by Senator Carper, I am very proud that you folks have done that.

It is hard for me to believe that Jeff Merrifield has been around as long as he has. It seems like just the other day, you left Bob Smith's staff to take this position. How many year has that been now?

Mr. MERRIFIELD. Almost nine.

Senator INHOFE. Almost 9 years. Well anyway, you have done a great job and we will certainly miss you around here, Commissioner McGaffigan, and I will pray for you. I know you are going through a very difficult time, but I am glad that you are in a position to continue this service.

Now, ironically, when Chairman Carper came out with his five points, I have the same five points that I was going to mention, perhaps in a little——

Senator CARPER. That is scary, isn't it?

Senator INHOFE. It is scary. You know, you and I, we are not supposed to agree on all these things. I think in the combined license applications, we are very interested in making sure that we have the capacity to take care of these. You have heard me say it over and over and over again with the energy crisis that have, it is just impossible to look down the road and see that we are going

to be able to resolve this problem without a heavy emphasis on nuclear. We have talked about this for many years.

I hope that in your opening statements, you are going to be able to talk about how you are going to keep up with this workload. I agree with Senator Voinovich that the guaranteed loan program is vital to ensure that we have a new nuclear fleet, a new fleet of reactors, and I am open to suggestions on how the program can be expanded.

I am pleased that you are finalizing the Part 52 rule. You might remember, now, you promised you would have it by January, and here it is April and it just came out. I am not going to suggest that if we hadn't had this hearing that it wouldn't be out yet, but nonetheless, I am glad it is out now.

We need to get Yucca Mountain open and accepting waste as soon as possible. I understand that you can't pre-judge the application. I do want to know whether you need any additional resources or legislative authority to deal with the waste issues.

Finally, on security, I think we have done a good job. I read with interest, I would say to my members here, and I would like to have this page 2 of the NRC Security Spotlight publication made a part of the record immediately following my remarks.

Senator CARPER. Without objection.

Senator INHOFE. It kind of shows us that maybe we are overreacting, if you want to say that, to some of the security risks because it shows by comparison the World Trade Center, the Pentagon, and then the nuclear reactors and how they are protected and with what kinds of materials. So it is very revealing, and I would like to have that to be a part of the record.

[The referenced document was not available at time of print:]

Senator INHOFE. Now, that concludes my opening statement. I have the same problem now that I seem to have every time, and that is, we have an Armed Services Committee hearing taking place at the same time. Because of my seniority there, it is required. So I am going to go back and forth between these hearings.

Thanks for having this hearing.

[The prepared statement of Senator Inhofe follows:]

STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

First I want to thank Chairman Carper for holding this oversight hearing today. This is the tenth in a series of oversight hearings that began in 1997 when I was the Chairman of this subcommittee, and Senator Voinovich later continued that tradition. Prior to that first hearing there had not been an NRC oversight hearing in more than a decade.

I think Senators' Carper and Voinovich would both agree with me that every bureaucracy needs oversight and the NRC has certainly improved immensely over the last 10 years. I would have to say that the NRC has developed into a model agency, and I was pleased to hear that the NRC has been ranked as the best agency to work for in the Federal Government.

I must say that in order for the agency to succeed, you must have good leadership and I believe we have had some outstanding Commissioners and Chairmen over the last decade. I want to publicly thank Commissioner Merrifield for his service and dedication, this is probably your last hearing before this Committee, at least as a Commissioner, and you have done an outstanding job.

I would also like to recognize Commissioner McGaffigan, I was happy to hear that your health had improved to the point that you have withdrawn your resignation. I am looking forward to you completing your current term, and I hope you will consider an additional term.

That being said, there are many challenges before the Commission, and there is always room for improvement. I have a few issues that I hope you will address in your statements, and I will follow up during my question and answer.

1. At our hearing last June we discussed the NRC receiving 11 Combined License Applications (COLs). I now understand that you may receive as many as 22 over the next 2 years. I had concerns last year on whether you were prepared for 11. Are you prepared now for 22? How long do you think each COL will take to process?

2. I agree with Senator Voinovich that the guaranteed loan program is vital to ensuring that we have a new nuclear fleet, and I'm open to suggestions on how this program can be expanded.

3. While I am pleased that you are finalizing the "Part 52 Rule," for early site permits, I am also concerned about the delays in getting the final rule out and I hope its not a sign of too many agency bottlenecks as we move forward.

4. We need to get Yucca Mountain open and accepting waste as soon as possible. While I understand you cannot prejudge the application, I do want to know whether you need any additional resources or legislative authority to deal with the waste issues.

5. Finally, on security, I think you have done a very good job, we have had a number of closed-door security briefings in this Committee in the past, and I hope those continue. While you must remain diligent in guarding against new risks, you must also balance that against making too many changes in the regulations before all of the security measures have been put into place.

Senator CARPER. We will save your seat. Thanks very much for joining us for the beginning of this hearing.

We have been joined by the Ranking Member and former chairman, my friend George Voinovich. He said, why don't we turn to Senator Bernie Sanders and ask Bernie to make his opening statement, and we yield to Senator Voinovich.

Senator Sanders, glad to be here with you, and thanks for joining us.

STATEMENT OF HON. BERNARD SANDERS, U.S. SENATOR FROM THE STATE OF VERMONT

Senator SANDERS. Thank you very much, Mr. Chairman.

Like Senator Inhofe, I am going to have to apologize and apologize to our guests. I have an amendment on the floor that I should tend to.

This is an important hearing and I very much appreciate your having it. As you may know, Mr. Chairman, I have introduced S. 1008, which would allow a Governor of a State in which a nuclear facility is located, or a Governor of a nearby State close to the facility, or the Public Service Commission of the State the facility is located in, to request an independent safety assessment akin to the thorough assessment at Maine Yankee.

The issue here that we all understand is that nuclear power, without getting into the whole controversy surrounding nuclear power, it is dangerous stuff. I can't believe that there is anybody in the Senate, anybody of our panelists, who do not want to make sure that the best and most thorough safety examination of a nuclear powerplant takes place. There can be no argument about that, it seems to me.

The reality is, I can tell you that in Vermont, and I think in many places in the Country where nuclear powerplants are located, is that there is not enormous confidence that the NRC is doing all that it can. If nuclear safety is fully assured by NRC's procedures, what possible objection could the NRC have to allowing States to request such an assessment?

In other words, this is an issue that I think, frankly, you have to go the extra mile on. You have to reassure everybody that everything is being done; every question is being asked; every question is being answered to make sure that a nuclear powerplant is absolutely as safe as humanly possible.

If there is nothing to hide, then even the nuclear industry itself should welcome a thorough assessment, and I hope that they would. Unfortunately, the last time such a thorough assessment was conducted at the Maine Yankee nuclear facility, so many problems were found that the owners decided to shut the facility down, rather than to fix all the problems, problems which the NRC routine inspections had not found.

The NRC adopted a reactor operating program, or ROP, in response. How do we know the ROP is working unless we give it a verification test such as an outside, independent assessment as provided for in the legislation that I have introduced? I know that the NRC is not particularly happy about that, but I think the American people want to make sure that there is an independent assessment.

I also note that in June 2006, Senator Jeffords, who held this seat before I did, of Vermont, asked at a hearing on this same topic about the April 2005 GAO report on nuclear material controls. That report discussed, among other matters, the loss of spent fuel rods at Vermont Yankee in 2004. The GAO report recommended that the NRC establish requirements for the control of loose fuel rods and develop inspection procedures to verify clients' complaints.

The NRC wrote to Senator Jeffords in 2005 saying that it was addressing the GAO's findings. However, by the 2006 hearings, Senator Jeffords noted that little progress in actually implementing these recommendations had been accomplished. I feel sure that we will hear about the progress today. I hope we will, as I am confident you have made strides on this issue since 2006.

Senator Clinton pointed out at that same June 2006 hearing that the GAO had conducted yet another investigation, the results of which were released in March 2006. This report found that undercover teams had carried small amounts of cesium 137 through border checkpoints undetected, and that there were over 1,000 incidents where radiation sources have been lost, stolen, or abandoned. I hope that we hear today an update on the progress of reforms addressing both the 2005 and 2006 GAO reports.

So thank you very much, Mr. Chairman, for holding this hearing. It is an important hearing. We are glad the panelists are here. There are a lot of issues to be gone over. I want to apologize for having to leave.

Senator CARPER. No apology is necessary. We are delighted you are here. We understand. Senator Sanders, thanks for joining us.

Senator Voinovich, you are on, my friend.

STATEMENT OF HON. GEORGE V. VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

Senator VOINOVICH. Thank you, Mr. Chairman.

Senator Sanders, one of the things that I am going to request the chairman of this committee to do is to have a closed session hearing with the Nuclear Regulatory Commission where every member

of this committee will be asked to attend. We did this a couple of years ago and it was very revealing. I think that it would be in your best interests and mine and the country's if we had one of those.

Senator SANDERS. Thank you. I look forward to participating in that.

Senator VOINOVICH. I would like to welcome Chairman Klein and Commissioners McGaffigan, Merrifield and Jaczko. It is nice to have this first hearing of this Congress, Mr. Chairman.

Mr. Merrifield, this probably is the last time you will be before us, serving on the commission honorably since 1998. I just want you to know how much I appreciate your dedication and the kindness that you have extended to me. I hope you feel very, very good about the service that you have performed on the NRC.

Mr. MERRIFIELD. I do. Thank you, Senator.

Senator VOINOVICH. I would also like to acknowledge Commissioner McGaffigan, whose selfless devotion to duty and dedication as a public servant should be a model for everyone in Government service. Ed, I really appreciate the fact that you are here and you are standing there, and you know that you are in my prayers and the prayers of a whole lot of other people.

Mr. Chairman, with this group of highly talented and dedicated individuals, it is no accident that the NRC has been ranked the best place to work in the Federal Government. I like that. It is pretty good. I believe that our persistent and demanding oversight of the NRC is bearing fruit in the form of steady improvements at the NRC. Of the 19 subcommittee hearings you and I have held in the past two Congresses, six were dedicated to NRC oversight.

We have also engaged the Government Accountability Office to conduct independent reviews of the NRC in a number of critical areas. Perhaps one of the most significant improvements at the NRC involves overhauling its reactor oversight process they refer to it as the ROP—for nuclear plants. Applying the lessons learned from the Davis-Besse incident in 2002, which now includes an assessment of safety culture at nuclear powerplants, is viewed by all stakeholders, including GAO, which issued a report last fall, as a major success story.

NRC has also made significant strides in enhancing nuclear plant security and improving its efficiency in license renewal and power up-rate review processes.

During the last Congress, this committee spent a considerable amount of time on legislation to provide for the safe and secure growth of nuclear power. Legislation and several other key initiatives were included in the 2005 Energy Policy Act, leading the NRC to project that we will receive, and this keeps varying from 1 week to the other, but 18 applications for 27 reactors within the next 2 to 3 years.

This is a huge challenge for an agency that has not seen this type of major licensing actions in the last 25 years or so. It is a huge change also, frankly, for all of the manufacturers and others that are out there that are going to need to support this effort. That is why we also held three NRC oversight hearings last year to ensure that NRC is aggressively gearing up to meet this challenge.

In addition to the new reactors, the commission must continue to deal with license renewals and increased generation capacity for existing plants, security assessments and regulations licensing Yucca Mountain, and the day-to-day regulatory activities for the Nation's 103 operating plants. It is a big responsibility.

We were also able to secure additional funds for the NRC through fiscal year 2006 and 2007 appropriations for nuclear plant security, new reactor licensing, and human capital and management.

I want to thank the chairman and the other people that we lobbied at OMB to get the money that they needed so that we could do our part to leverage another $93 million from the private sector.

The bottom line is that we have provided every legislative and funding provision that the NRC requested and more, Dr. Klein. I am anxious to hear your testimony to get an update on the Agency's progress in meeting these challenges. I know many of you heard me say this more than once, but I think it is worth repeating. The Commission must take a balanced approach as a regulator that ensures the safe and secure operation of the existing fleet of nuclear plants without stifling the growth of nuclear power.

I expect the Commission to apply the same set of performance standards for the Agency as they do with their licenses to guard against complacency, while focusing its resources on those issues that truly make a significant difference.

Mr. Chairman, while the focus of this hearing is on NRC oversight, I must bring to the committee's attention broader challenges that this Nation is facing if we are to continue and hopefully increase our Nation's use of nuclear power, which I believe is essential to meeting our environmental, energy and economic needs.

Although one of the objectives of the 2005 Energy Policy Act is to do exactly that, I am afraid the Administration's implementation of the energy bill has been slow at best, and leaves a lot to be desired. I recently met with Secretary Bodman and OMB Director Portman to discuss the importance of the 2005 energy provisions, especially the loan guarantee provision, in jump-starting new nuclear plant construction.

I am also concerned about the lack of domestic industry base for nuclear plant components and lack of human capital. Currently, there is only one facility worldwide, in Japan, that is capable of producing heavy forgings for commercial nuclear reactor vessels. Consequently, there is a 4-year lead time for procuring such critical components.

Whatever this country does, it is clear that nuclear power is growing elsewhere in the world. The Nation would be well served if our own energy needs serve as a springboard to not only do the nuclear power, but to rebuild U.S. technology and manufacturing capabilities so that we can once again provide the leadership worldwide, contributing to foreign markets, as well as supporting our own.

Mr. Chairman, I really sincerely appreciate your holding this hearing, and I look forward to more of them this year and, more importantly, hearings with Chairman Klein in your office.

[Laughter.]

Senator VOINOVICH. Thank you.

[The prepared statement of Senator Voinovich follows:]

STATEMENT OF HON. GEORGE V. VOINOVICH, U.S. SENATOR FROM THE STATE OF OHIO

Thank you, Mr. Chairman.

I would like to welcome Chairman Klein, Commissioners McGaffigan, Merrifield, Jaczko (pronounced Yatz-ko), and Lyons to our first subcommittee hearing of this Congress—welcome.

Commissioner Merrifield, this probably is the last time that you will be before us after serving on the Commission honorably since 1998. I sincerely appreciate your years of dedication and hard work and wish you well in your new career.

I would also like to acknowledge Commissioner McGaffigan whose selfless devotion to duty and dedication as a public servant should be a model for everyone in government service. Mr. Chairman, with this group of highly talented and dedicated individuals on the Commission, it is no accident that NRC has been ranked the best place to work in the Federal Government.

Mr. Chairman, I do believe that our persistent and demanding oversight of the NRC is bearing fruit in the form of steady improvements at the NRC. Of the 19 Subcommittee hearings you and I have held in the past 2 Congresses, six were dedicated to NRC oversight. We have also engaged the Government Accountability Office to conduct independent reviews of the NRC on a number of critical areas.

Perhaps one of the most significant improvements at the NRC involves overhauling its Reactor Oversight Process (ROP) for nuclear plants, applying the lessons learned from the Davis-Besse incident in 2002. The ROP, which now includes an assessment of safety culture at nuclear power plants, is viewed by all stakeholders, including the GAO which issued a report last fall, as a major success story. NRC has also made significant strides in enhancing nuclear plant security and improving its efficiency in license renewal and power uprate review processes.

During the last Congress, this Committee spent a considerable amount of time on legislation to provide for the safe and secure growth of nuclear power. Our legislation and several other key initiatives were included in the 2005 Energy Policy Act, leading the NRC to project that they will receive 18 applications for 27 reactors within the next 2 to 3 years.

This is a huge challenge for an agency that has not seen this type of major licensing actions in the last 25 years or so. That is why we also held three NRC oversight hearings last year to ensure that NRC is aggressively gearing up to meet this daunting challenge.

In addition to new reactors, the Commission must continue to deal with license renewals and increased generation capacity for existing plants, security assessments and regulations, licensing Yucca Mountain, and the day-to-day regulatory activities for the Nation's 103 operating plants. We were also able to secure additional funds for the NRC through FY2006 and FY2007 appropriations for nuclear plant security, new reactor licensing, and human capital management.

The bottom line is that we have provided every legislative and funding provision that NRC requested and more. Dr. Klein, I am anxious to hear your testimony to get an update on the agency's progress in meeting these challenges.

I know many of you heard me say this more than once, but I think it is worth repeating. The Commission must take a balanced approach as a regulator that ensures the safe and secure operation of the existing fleet of nuclear plants without stifling the growth of nuclear power. I expect the Commission to apply the same set of performance standards for the agency as they do with their licensees to guard against complacency while focusing its resources on those issues that are truly safety significant.

Mr. Chairman, while the focus of this hearing is on the NRC oversight, I must bring to the Committee's attention broader challenges that this Nation is facing if we are to continue and hopefully increase our Nation's use of nuclear energy, which I believe is essential to meeting our environmental, energy, and economic needs.

Although one of the objectives of the 2005 Energy Policy Act is to do exactly that, I am afraid that the Administration's implementation of the energy bill has been slow at best and much to be desired. I recently met with Secretary Bodman and OMB Director Portman to discuss the importance of the 2005 energy bill provisions, especially the loan guarantee provision, in jump-starting new nuclear plant construction.

I am also concerned about the lack of a domestic industry base for nuclear plant components and lack of human capital. Currently, there is only one facility worldwide (Japanese) that is capable of producing heavy forging for commercial nuclear

reactor vessels. Consequently, there is a 4-year lead time for procuring such critical components.

Whatever this country does, it is clear that nuclear power is growing elsewhere in the world. The Nation would be well served if our own energy needs serve as a springboard to rebuild U.S. technology and manufacturing capabilities so that we can once again provide the leadership worldwide, contributing to foreign markets as well as supporting our own.

Mr. Chairman, thank you once again for holding this hearing.

Senator CARPER. Thank you, Senator Voinovich.

This hearing occurs today at a time when we are witnessing a renaissance in nuclear power in this country. This is a time of promise. This is also a time of real challenge for our Nation, a time of challenge because of our huge and growing dependence on foreign oil; a time of challenge because of our need to reduce that dependence; and also to reduce the emission of harmful substances into our air, sulfur dioxide, nitrogen oxide, mercury, and carbon dioxide.

There are any number of promising ways to address those challenges. In my mind, one of the most promising is nuclear power, and to grow our dependence on nuclear power as we better master our ability to harness the wind, solar energy, geothermal and hydro, biomass, and just to find ways to run this country in ways that are more environmentally friendly and to better conserve the energy that we do produce.

A friend of mine, we were talking about this hearing, Senator Voinovich, and about the need to move expeditiously to approve the applications that are being submitted to the Commission, but at the same time, to make sure that we move judiciously, and that we continue to focus on safety and security.

One of the best ways to derail this nuclear renaissance is for accidents, for incidents to occur, for mishaps to occur, and for behavior to occur at nuclear powerplants in a way that undermines the confidence of the people in general, the Congress, and others. That puts a heavy burden on all of you, almost a sacred responsibility. I know you take that seriously.

Before I recognize Chairman Klein, I want to do two quick things. I understand one of our Commissioners is not here today. I understand Commissioner Lyons is traveling out of the country today. He has submitted a written statement and he has asked that his statement be submitted for the record. If there is no objection, we will do that. Hearing no objection.

[The referenced document follows on page 63.]

Senator CARPER. Also I just want to say to Ed McGaffigan how pleased we are that you are here. Others have said this as well, I don't want you to think we are piling on, but we are just delighted that you are still standing and that you are still sitting here at this table. I look forward very much to all of your testimonies, but particularly that of you and your colleague, Mr. Merrifield.

Chairman Klein, you are recognized, and thank you.

STATEMENT OF DALE E. KLEIN, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. KLEIN. Thank you.

Mr. Chairman and members of the committee, my fellow Commissioners and I are pleased to appear before you to discuss the Nuclear Regulatory Commission's programs. Unfortunately, as you indicated, Commissioner Lyons was unable to be with us today due to a longstanding engagement.

As you also already recognized, this might be Commissioner Merrifield's last appearance before this committee. I would certainly like to take this opportunity to thank him for his two terms of dedicated service to the NRC. Since he was first appointed in 1998, Jeff has proven himself to be a tireless and curious student of the NRC's facilities and operations in order to fulfill better his responsibilities as a Commissioner. Now that he is making what might be his last official appearance, we certainly want to recognize Commissioner Merrifield for his contributions.

As you indicated, we would also like to congratulate Commissioner Ed McGaffigan on his health recovery so far. Obviously, his treatment has had a positive impact on the cancer, and we look for many more months, if not years, of service. He has only had about 40 years of public service, so he is just getting started in that mode.

As you acknowledged, in the other good news category, the NRC was recognized as the best place to work in Federal Government. It was my pleasure to accept the award on behalf of the Agency. While I certainly appreciated the honor of being the one to formally accept this award, I did so only on behalf of my fellow Commissioners, our managers and supervisors, and our many fine employees, all of whom really deserve the credit.

Mr. Chairman, the Commission has submitted written testimony to the committee. In the interests of brevity, let me just provide a synopsis of some of the key points.

As the committee well knows, the principal challenge facing the NRC today is maintaining the highest standards of regulatory oversight with regard to existing reactors, while also preparing for the expected revival of the commercial nuclear power industry in the United States.

Of the 104 licensed reactors in the United States, the NRC has authorized license extensions for 48, and applications for license extensions for an initial 8 reactors are under review. Further, we expect to receive applications to renew the licenses of 10 more reactors between now and the end of fiscal year 2008. Ultimately, it is expected that almost all licensed reactors will eventually apply for renewal.

The NRC has also been actively overseeing the addition of 1,350 megawatts of nuclear generating capacity in the U.S. supply by this summer. This includes the reactivation of TVA's Browns Ferry Unit 1 plants and the authorization of a number of power up-rates for other reactors.

The NRC has been working to develop effective and efficient licensing review strategies and processes to support the renewed interest in constructing new nuclear powerplants. The advent of standardized design certification, early site permitting, and combined operating licenses has contributed substantially to the feasibility of new nuclear projects in the United States.

Moreover, the NRC has been updating the regulatory infrastructure needed to review and approve new applications, including issuance of extensive guidance for applicants.

On April 11, 2007, the Commission approved the final rule updating Part 52, subject to changes that the staff is now incorporating in the final rule language. In the area of reactor security, NRC has significantly increased its ability to provide effective oversight at power reactor facilities, including more realistic force-on-force exercises.

We have also just proposed a rule that would require each applicant for new reactor designs to assess how the design, to an extent practicable, can have greater built-in protections to avoid or mitigate the effects of a large commercial aircraft impact, making them even more resistant to attack. This is the most recent step initiated by the NRC after September 11, 2001, to improve the security of reactors and supplements plans and strategies already in place to respond to a wide range of events, including the impact of an aircraft.

Later this year, we expect to receive the first application for new reactors to be quickly followed, we are told, by about 18 more applications covering, as you indicated, 27 reactors. We also have six others that are in the planning process.

In addition, the NRC is now reviewing applications for a mixed oxide fuel fabrication facility and a new centrifuge uranium enrichment plant. Reviewing a license application for the Yucca Mountain waste repository will also represent a tremendous amount of work, assuming DOE submits its application in June 2008.

In preparation for our expanded workload, the NRC has already increased personnel by 280 since the beginning of fiscal year 2006, and we will add approximately 200 staff annually through 2008.

We are also striving to secure additional space to alleviate current cramped conditions. While this expansion progress is still ongoing, I should note that it has been made possible by the successful outcome of the continuing resolution. We appreciate the funding Congress is providing for us to carry out our critical public mission.

Mr. Chairman, my fellow Commissioners and I understand the challenges we face in the licensing of new reactors, while continuing our rigorous oversight of existing reactors and nuclear materials. We look forward to working with the members of the committee so that we may faithfully perform the duties entrusted to us by the American people.

Mr. Chairman, this concludes my opening statement. I ask that my written testimony be entered into the record.

Thanks very much.

[The prepared statement of Mr. Klein follows:]

STATEMENT OF DALE E. KLEIN, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

INTRODUCTION

Mr. Chairman and members of the subcommittee, it is a pleasure to appear before you today to discuss the Nuclear Regulatory Commission's budget and programs. On behalf of the Commission, I thank you for your continued support of the NRC's critical work to protect public health and safety.

We face many complex issues, some familiar and many new, involved in the resurgence of interest in nuclear energy in this country and around the globe. This renewal of interest in building new nuclear power plants means that my fellow Com-

missioners and I face a much different set of challenges than many of our predecessors.

For many past NRC Chairmen and Commissioners, efforts were exclusively focused on maintaining the safety and security of operating reactors and preparing for the decommissioning of those reactors as their licenses expired. While the safety and security of our existing licensees remains our highest priority, the Commission is now also facing new challenges. Growing electricity demands and environmental concerns have caused the U.S. electricity industry once more to include nuclear facilities in their plans for future generating capacity. The Congress, in the Energy Policy Act of 2005, acted to facilitate the necessary planning and financing process for new plants.

Our current and potential future workload is heavily weighted toward not only maintaining the safety and security of existing facilities and nuclear materials users, but also processing reactor license renewals, power uprate requests, early site permits, advanced reactor design certifications, and applications for combined licenses (COL). The first influx of COL applications is expected to arrive at the NRC later this year. The NRC has also been actively overseeing the addition of 1350 megawatts of nuclear generating capacity to the U.S. supply by this summer through reactivation of TVA's Browns Ferry Unit 1 plant and authorization of a number of power uprates for other operating reactors.

We face a daunting future workload if industry predictions for new plant applications hold true, but the Commission is confident that the NRC is up to the task. Our Strategic Plan includes the following objective:

Enable the use and management of radioactive materials and nuclear fuels for beneficial civilian purposes in a manner that protects public health and safety and the environment, promotes the security of our Nation, and provides for regulatory actions that are open, effective, efficient, realistic, and timely.

The NRC is committed to living up to every word of that objective. Our actions will be open and timely because this fosters public confidence, and we will value input from all stakeholders. The continued operation of existing plants and the development of new nuclear facilities in the U.S. depends upon a safety record that merits public confidence in the NRC. We are making every effort to ensure that our actions are effective, efficient, and realistic. We are putting into place improved processes and clear guidance to our licensees that will enable us to move applications and other regulatory requests, rulemakings, and other activities forward with more dispatch.

I have frequently said since assuming the Chairmanship that my vision for the NRC is a simple one. We must be a strong regulator. We will hold our licensees accountable. We will articulate our requirements clearly. We will be demanding and we will be responsive to their legitimate needs and concerns. All stakeholders, the nuclear industry, the financial community, and especially the public, must be made aware of the status and progress of issues of interest to them.

Looking forward, there are two pinch-points for future growth in the nuclear sector—manufacturing capacity and human capital. Notably not on that list is licensing. If industry does its job and presents us with quality applications, the NRC will require less time to complete our review. Show us quality and clarity, we tell our applicants, and the NRC will show timeliness.

CURRENTLY LICENSED NUCLEAR REACTORS

My fellow Commissioners and I firmly believe that the continued safe and secure operation of currently licensed nuclear reactors is crucial to the future of nuclear energy in this country. Our most basic regulatory charge is protection of public health and safety, and we cannot and will not allow activities aimed at future reactor applications to dilute our focus on the oversight of operating reactors.

The creation of the Office of New Reactors, with its exclusive focus on reviewing new applications, ensures that the Office of Nuclear Reactor Regulation will maintain its focus solely on the safety of existing plants. We continually monitor performance at each plant and also monitor industry performance and events to identify any adverse trends. Our Regional office staff and the resident inspectors at every operating U.S. nuclear power plant are vital contributors to this process and reinforce our commitment to safety.

Our Reactor Oversight Process (ROP) is a flexible, risk-informed process that uses a variety of tools to evaluate individual plant performance. Performance is measured by a combination of objective performance indicators and the findings of the NRC inspection program. The process focuses on plant activities most important to safety and increases the level of oversight on any elements that appear to be declining.

The ROP is assessed and improved every year as a result of our commitment to a continuous improvement program.

The 103 currently operating commercial nuclear power plants are placed into five performance categories, with category 1 being the best ranking and category 5 indicating unacceptable plant performance for which the NRC has ordered the plant to be shut down. The amount of oversight a plant receives increases as its performance ranking decreases. We recently completed our 2006 annual plant performance assessments, and the results are available on our website (www.nrc.gov). It is important to note that no plants are listed in category 5.

The NRC's activities to support existing licensees also include the review of significant licensing actions each year, such as improved standard technical specifications, power uprates, license transfers, and quality assurance. Our reactor license renewal process continues to work smoothly. Of 104 licensed reactors in the U.S., the NRC has authorized license extensions for 48, and applications for an additional eight reactors are under review. We expect to receive applications to renew the licenses of 10 more reactors between now and the end of fiscal year 2008, and that almost all licensed reactors will eventually apply for renewal.

In addition, our review of power uprate requests remains timely. The NRC has been processing licensee power uprate requests since the 1970's as a way to safely increase the power output of their plants. The NRC staff has approved 113 such applications to date. As a result, approximately 4,900 megawatts-electric (MWe) in electric generating capacity have been added to the Nation's electrical grid. This is equivalent to about 4.9 nuclear power plant units. The NRC currently has ten additional uprate applications under review, and an additional 10 applications are expected through Fiscal Year (FY) 2008. In April 2007, the NRC staff surveyed nuclear power plant licensees to determine whether they planned to submit additional power uprate applications over the next 5 years. Based on this survey, licensees plan to request power uprates for 28 nuclear power plants over the next 5 years. If approved, these power uprates will result in an increase of about 1,473 MWe in electrical generating capacity, or roughly 1.5 nuclear power plant units. Furthermore, on January 16, 2007, the Commission authorized the Regional Administrator, Region II, to permit the restart of Browns Ferry Unit 1 once the licensee has accomplished all items identified for completion prior to reactor startup and those items have been confirmed as satisfactory by the NRC staff. On March 6, 2007, the NRC staff completed its review of the Browns Ferry Unit 1 uprate application. This completes the major licensing activities required for the restart of Browns Ferry Unit 1, which has been shut down since 1985. This week, the NRC is conducting confirmatory inspections prior to restart. The planned restart of Browns Ferry Unit 1 will add an additional 1153 MWe of generating capacity to the Nation's power grid in time for the peak summer load.

Our proposed fiscal year 2008 budget includes resources to develop and maintain the technical tools and expertise needed to support regulatory decisions involving operating reactors, such as those governing power uprates, license renewals, analysis of aging and integrity of reactor systems, security assessment and mitigating strategies, radiation protection, effectiveness of inspections, evaluation of operation experience, and event readiness.

NEW REACTORS

The NRC's fiscal year 2008 budget includes $217 million for new reactor activities resulting from the renewed interest in constructing nuclear power plants. Specifically, the NRC will conduct pre-licensing and licensing reviews consistent with projected industry schedules. The nuclear industry is projecting submittal of at least 18 COL applications to the NRC over the next 2 years for at least 27 new nuclear power reactors. Appendix 1 to this testimony provides a list of the expected new nuclear power plant applications. In fiscal year 2008, the NRC expects to begin conducting the safety, security, and environmental reviews of COL applications. In fiscal year 2008, NRC will continue to develop the construction inspection program. The NRC will conduct technical reviews and mandatory hearings associated with two early site permit (ESP) applications and review three standard design certification applications. We will continue to update the agency's regulatory infrastructure, and research activities will be conducted to support reviews of the COL applications and new reactor designs. Research will also focus on developing tools, data, and expertise applicable to a broader range of reactors, including those under consideration for the Department of Energy's (DOE's) Next Generation Nuclear Plant Project.

We expect that the first COL application will come as early as late October of this year, although it is not certain from which utility, since the number of applications

and expected submittal dates change frequently. However, I assure you we are not just passively waiting. We are actively preparing. One example of our efforts in this area is the review of early site permits. The staff has issued two ESP's and is actively reviewing two additional ESP applications. The staff is also engaged in pre-application coordination with utilities that have announced their commitment to apply for a COL. This coordination, in terms of the expected quality and content of the application, will result in a much higher level of quality of incoming applications, which will in turn result in a more efficient NRC review. NRC staff has been working to develop effective and efficient licensing review strategies and processes. We have made the necessary organizational changes and are in the process of hiring the staff and providing them the resources to review the applications thoroughly and expeditiously.

With the creation of the Office of New Reactors, we will provide dedicated technical and administrative resources for new reactor reviews. In addition, we have created a single, dedicated construction inspection organization located in the NRC's Region II office in Atlanta. A majority of the new reactors will be located for the Southeast.

The NRC also is updating the regulatory infrastructure needed to review and approve new applications, including issuance of extensive guidance for applicants. We completed updating the existing regulatory guides in March 2007, using an accelerated schedule to allow the industry to use the revised guides in preparing their applications and for other stakeholders to receive them in a timely fashion. We also developed a combined license application regulatory guide, which is currently available in draft form and will be finalized in coordination with the final rulemaking on Part 52.

On April 11, 2007, the Commission approved a final rule updating Part 52, subject to changes that the staff is now incorporating into the final rule language. The Commision's decision is available to the public. The Part 52 rule is expected to be issued in mid July 2007. Our new combined licensing procedure, along with limited work authorization rules, will make the new reactor licensing process more effective and efficient. The changes provide applicants greater flexibility by providing more licensing options, allowing them to submit license applications in phases. NRC's use of a design-centered review approach will use, as much as practicable, a (one issue-one review-one position(strategy that recognizes that the new reactor designs to be used are standardized and that issues common to multiple applications require less NRC review effort once they have been resolved for the initial application.

A new limited work authorization rule will remove the need for applicants to obtain NRC approval for pre-construction activities that do not have a nexus to radiological health and safety or the common defense of security. These estimates include site clearing, transmission line routing, road building, and construction of warehouse and shop facilities.

NRC also revised its standard review plan for the review of COLs, focusing primarily on capturing current accepted guidance and ensuring consistency with the Part 52 licensing processes. The revised standard review plan was issued and will allow prospective applicants to comply with the regulatory requirement that they perform an analysis using the guidance in effect 6 months prior to the docket date on an application.

The NRC also has been working with the Department of Homeland Security (DHS) to establish a framework for coordination between the two agencies concerning the security and emergency preparedness areas that must be addressed during the approval process for new reactors.

The Part 52 process evolved from 30 years of lessons learned in licensing today's operating reactors. However, there are still aspects of the COL process that cannot be known until it is tested through completion of an actual application. While the NRC acknowledges that we are entering new territory, we are nevertheless attempting to provide as much predictability as possible while ensuring maximum regulatory stability as this technologically complex industry begins to move to its next generation of reactors.

HIGH-LEVEL WASTE REPOSITORY

The DOE has stated that it expects to submit its high-level waste repository license application to the NRC in FY 2008. Based on this expected application date, the NRC's fiscal year 2008 budget provides funds for pre-licensing activities, including emergent issues and inspection activities addressing repository design confirmation, pre-closure safety, performance confirmation, and the effectiveness of the DOE quality assurance program. Additionally, the NRC will review designs for transport

and aging (storage) casks for use with the DOE transport, aging, and disposal canister-based system.

NUCLEAR MATERIALS

The NRC fiscal year 2008 budget includes $160 million to conduct an effective regulatory program for 12 fuel cycle facilities, nine greater-than-critical-mass facilities, two proof-of-production operations for future enrichment facilities, and approximately 4,350 licenses for radioactive materials used for medical, industrial, and academic purposes, including oversight of 34 Agreement States that license an additional 17,600 materials users. This includes implementation of NRC's responsibility under the Energy Policy Act of 2005 to regulate additional byproduct materials users. The NRC will also continue to review an application for possession and use of licensed material at the mixed-oxide fuel fabrication facility and implement our inspection program for this facility in South Carolina. The NRC understands that it will likely have a role to ensure that commercial facilities proposed under the Global Nuclear Energy Partnership are both safe and secure. We are working with DOE on a Memorandum of Understanding that would allow NRC to understand better the technology that is intended to recycle spent fuel and significantly reduce the amount of waste that would have to be sent to a permanent repository.

FY 2008 resources support decommissioning licensing and inspection activities at approximately 14 power and early demonstration reactors, 11 research and test reactors, and approximately 18 complex materials and fuel facilities sites. The NRC will continue its oversight of the West Valley Demonstration Project, as necessary, to support the implementation of the West Valley Demonstration Project Act.

The NRC's fiscal year 2008 budget includes $2 million to provide oversight of certain DOE waste determination activities and plans consistent with the NRC's responsibilities in the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005. This act requires DOE to consult with the NRC on its waste determinations for facilities in South Carolina and Idaho, and directs NRC to monitor DOE disposal actions to assess compliance with the performance objectives outlined in regulations.

SECURITY

Since 1973, our agency has required licensed power reactors to have robust security programs and licensed nuclear material to be protected. Over the past 5 years, the NRC has required many security enhancements at licensed power reactors and Category I fuel cycle facilities. Our licensees now have increased patrols, stronger and more capable security forces, additional physical barriers, greater standoff distances for vehicle checks, more restrictive site access controls, enhanced emergency preparedness and response plans, enhanced coordination with law enforcement authorities, and many other heightened security measures. On a voluntary basis, licensees report suspicious activities occurring at or near their facilities. In addition, NRC intelligence analysts screen Intelligence Community threat reporting on a daily basis, looking for threats to NRC licensed facilities and materials as well as for changes in the general threat environment that could affect the security posture at the facilities we license. This information is analyzed within the context of other threat data and is shared with DHS and the Federal Bureau of Investigation (FBI). The Commission receives this information on a regular basis.

Nuclear power plants must, with high assurance, defend against the NRC's Design Basis Threat (DBT). The NRC supplemented its DBT rules by issuing orders in 2003 and 2006, and recently completed a public DBT rulemaking to codify and update enhancements implemented in recent years. The latest rule, among other features, meets the NRC's obligation under the Energy Policy Act to initiate and complete a rulemaking revising the DBT and to consider the 12 factors specified in the law. Another pending rulemaking would revise and update physical protection requirements.

The NRC also has significantly increased its ability to provide effective oversight of security at power reactor facilities. In 2000, NRC inspectors spent about 40 staff-weeks a year directly inspecting security. By 2003, the NRC was spending over 200 staff-weeks per year on security.

In addition, the NRC now conducts much more realistic force-on-force exercises as a part of its security inspection program, in which a highly trained mock adversary force simulates an attack on a facility. This program was officially implemented in November 2004. Since then, NRC has conducted more than 51 of these full-scale exercises and continues to work, using lessons learned, to make the exercises even more realistic. We also have required power plants to add more training and higher

qualification standards for security personnel and to increase substantially the numbers of security personnel, among other measures.

In our security efforts, NRC coordinates extensively with the DHS, FBI, and other Federal entities in integrating nuclear security efforts into national security planning. That raises the subject of aircraft. For the current operating reactors, the NRC ordered nuclear power plant licensees to develop specific plans and strategies to respond to a wide range of events, including the impact of an aircraft. Licensees have taken actions as a result of the NRC Advisories and Orders to mitigate the effects of a September 11-type aircraft attack. Even before these actions, nuclear power plants were designed to protect public health and safety. The plants achieved this through their robust containment buildings, redundant safety systems, highly trained operators and maintenance staff, stringent security plans, and armed security personnel. These plants are among the strongest and most difficult structures to break into in the country. They are designed to withstand extreme events, such as hurricanes, tornadoes, and earthquakes.

The NRC has used defense-in-depth to define its safety philosophy at nuclear power plants. Defense-in-depth means there are multiple measures that could prevent an accident or lessen the effects of damage if a malfunction or accident occurs at a nuclear facility. The NRC's safety philosophy ensures that the public is protected and that emergency plans for areas surrounding a nuclear facility are well thought out and workable. In that regard, NRC-licensed nuclear power plants and other facilities have detailed, well coordinated, and tested emergency response plans. These plans work to reduce the impact on the public in the event of a radiation release.

The NRC regularly communicates with other Federal agencies, including the DHS, the Federal Aviation Administration (FAA), and the Department of Defense (DOD), which have acted on specific occasions to protect airspace above nuclear power plants. The Aviation and Transportation Security Act of 2001 also provides additional protection against air attacks on all industrial facilities, both nuclear and non-nuclear, by strengthening aviation security.

The Commission has been engaged in discussions regarding the extent to which new plants should incorporate features against the impact of a commercial airliner. These new reactor designs will have improved safety features, such as spatially separated redundant safety systems, passive safety systems that do not require electrical power, and features to mitigate beyond design basis severe accidents. Such features will also clearly improve a plant's ability to resist and mitigate an aircraft crash. This matter is still under Commission review, and a decision is expected shortly.

A final note on the security of nuclear materials: NRC is developing a National Source Tracking System (NSTS) that will improve controls on risk-significant radioactive materials. We will continue to maintain an interim inventory of radioactive sources of concern throughout the U.S., updated annually, until the NSTS is fully implemented.

INTERNATIONAL ACTIVITIES

The NRC is ensuring that U.S. nuclear regulatory activities are consistent with, and reinforce, best international practices. The NRC is helping to ensure uninterrupted legitimate commerce by imposing enhanced controls over the export/import of nuclear facilities, components, and nuclear and byproduct material. The NRC supports the U.S. Government's broader policy and non-proliferation objectives through participation with the International Atomic Energy Agency and the Nuclear Energy Agency.

Fabrication of a significant percentage of the major components to be used in the construction of new reactors in the U.S. and internationally will be done by international manufacturers. NRC is actively engaged, on both a bilateral and multilateral basis, with its counterpart regulatory authorities in these countries to enhance sharing of relevant information, experience, and expertise to help ensure the legitimacy and quality of those components.

AGENCY INFRASTRUCTURE

Before addressing our infrastructure and human capital needs, I want to comment on the quality of the NRC staff. I have been at the agency about 10 months now, and I am extremely impressed. The agency is staffed with highly professional and dedicated workers who take very seriously the mission of protecting people and the environment. If it means long days, nights, weekends—they are willing to make that commitment to the American people because of the critical importance of the work done at the NRC.

That said, the volume of new work, coupled with our important ongoing responsibilities, presents an enormous challenge to the NRC. We are engaged in a vigorous effort to locate talented professionals to augment our workforce and to secure for them the additional workspace, information technology, and support services to allow them to do their jobs and allow the NRC to meet all of our commitments.

The NRC uses an automated strategic workforce planning tool to quantify staff capabilities and to identify critical skill and knowledge needs. We are then able to determine where gaps exist and recruit for those skills. The NRC is gaining staff at a pace allowing us to replace losses and hire additional staff to support new work. Our goal in fiscal year 2006 was a net gain of around 150 personnel. We exceeded that goal and are well on our way to meeting our FY 2007 hiring goal of a net gain of around 200 personnel.

Hiring is only part of the process, however. Retention is another challenge. The NRC has been rated as the best place to work in the Federal Government, and we intend to work hard to keep that first-place rating by providing a superior work environment for new hires. At our current staffing levels, NRC headquarters is filled to capacity, and we have a critical need for more space. Accommodating the growth of the NRC, and the associated requirement for additional space, is essential to meeting the country's growing energy needs while maintaining the NRC's superlative record of ensuring safety and reliability of nuclear power plant operation and the safe use of radioactive material. We have implemented a plan, with the support of the Office of Management and Budget (OMB) and the General Services Administration (GSA), to procure additional permanent space near our White Flint Complex and are hopeful that GSA will forward our space prospectus to Congress by the end of this month. While our long-term goal is a consolidated headquarters complex, we have procured interim space at two separate nearby locations through the GSA and are seeking a third to relieve our cramped quarters as we expand our workforce.

We are taking steps to ensure that the expected new and current NRC workforce has the tools to do its job. We are making a substantial investment to upgrade our Information Technology capabilities and provide the IT equipment necessary to support both new hires and the three additional locations we procured to meet our immediate space needs. For many years, the NRC has postponed improvements in the area of office automation and modernization of our legacy systems. We cannot afford to neglect this critical infrastructure component any longer, and this budget supports upgrades, such as the development of a collaborative electronic workspace for the review of new reactor license applications and the ability to conduct hearings in an electronic environment.

We expect to have a critical hiring need for at least the next 4 years. Although we are positioned to meet our hiring challenges over the next couple of years, it will be a continuing challenge to maintain our recruitment momentum. In the 2008–2009 timeframe, we expect hiring competition from utilities and nuclear manufacturers to intensify as they begin to staff up for construction of new nuclear plants. In addition, we face competition from other government agencies, the national laboratories, and academia.

The Commission's opinion is that this sharp increase in the need for professional and skilled craft workers could have wide-ranging and possibly unforeseen effects. The Commission believes that the NRC is well positioned to meet its own needs, but we are concerned that nuclear industry leaders may not be taking the problem seriously enough. To obtain regulatory approval, industry leaders must remember that new plants must not only be technically viable and robustly constructed, but must also be staffed by individuals competent and knowledgeable enough to operate them in a manner that fully protects public health and safety.

The Commission is equally concerned about the adequacy of the Nation's manufacturing capability as we approach the potential construction of 27 or more nuclear plants in the U.S. For example, there is only one U.S.-based manufacturer of some (not all) of the major components and systems needed to build a nuclear plant. No U.S. company builds commercial nuclear power plant reactor vessels.

The companies that will make the multi-billion-dollar orders for the next new plants must make critically important decisions as to where to buy their systems and components. Much of the technological and manufacturing capability to supply their needs now rests outside the United States. To compound the situation, many of the world's nuclear manufacturers are operating at capacity. Right now, the lead-time for delivery of reactor vessels is upwards of 4 years, and other key components have equally long backlogs. In the face of those long lead times, nuclear projects will need to get in line and scour the globe for available components and materials.

The NRC has rigorous inspection programs in place needed to ensure the quality and authenticity of the components that go into plants built in the United States. Since many of the components will be manufactured outside the United States and

the implementation of the inspection programs will necessitate that our inspectors perform inspections in the manufacturing countries, greater international cooperation will be essential.

CONCLUSION

Mr. Chairman, there are many more topics we could address today, and if we have neglected any topics of the Subcommittee's interest, we would be pleased to respond to your questions.

Let me just say in closing that the Commission remains dedicated to protecting public health and safety. Our conduct of all of our activities flows from that basic commitment. We understand the challenges we face in the licensing of new reactors while continuing our rigorous oversight of existing reactors and nuclear materials, and we are prepared to meet these challenges in an effective and timely manner. We ask for your continued support of the NRC budget to help us meet these challenges. My fellow Commissioners and I look forward to working with the Committee on these and other issues during this session and in years to come.

Expected New Nuclear Power Plant Applications Updated April 20, 2007				
Company	**Design Type**	**Site Under Consideration**	**State**	**Existing Plants**
2007 Applications				
Duke	AP1000	William Lee Nuclear Station (2 units)	SC	N
NuStart Energy	AP1000	Bellefonte (2 units)	AL	N
Progress Energy	AP1000	Harris (2 units)	NC	Y
Dominion	ESBWR	North Anna (1 unit)	VA	Y
NuStart Energy	ESBWR	Grand Gulf (1 unit)	MS	Y
South Carolina Electric & Gas	AP1000	Summer (2 units)	SC	Y
NRG Energy	ABWR	South Texas Project (2 units)	TX	Y
2007 TOTAL NUMBER OF APPLICATIONS =7 TOTAL NUMBER OF UNITS = 12				
2008 Applications				
Progress Energy	AP1000	Levy County (2 units)	FL	N
Southern Nuclear Operating Co.	AP-1000	Vogtle (2 units)	GA	Y
Entergy	ESBWR	River Bend (1 unit)	LA	Y
UNISTAR	EPR	Calvert Cliffs (1 unit)	MD	Y
UNISTAR	EPR	Nine Mile Point (1 unit)	NY	Y
TXU Power	US APWR	Comanche Peak (2 units)	TX	Y
Ameren UE	EPR	Callaway (1 unit)	MO	Y
Exelon	TBD	TBD (1 unit)	TBD	UNK
Detroit Edison	TBD	Fermi (1 unit)	MI	Y
Amarillo Power	EPR	Vicinity of Amarillo (2 units)	TX	UNK
2008 TOTAL NUMBER OF APPLICATIONS = 10 TOTAL NUMBER OF UNITS = 14				
2009 Applications				
Florida Power & Light	TBD	TBD (1 unit)	UNK	UNK
2009 TOTAL NUMBER OF APPLICATIONS = 1 TOTAL NUMBER OF UNITS = 1				
2007 – 2009 Total Number of Applications = 18 Total Number of Units = 27				

RESPONSES BY DALE E. KLEIN TO ADDITIONAL QUESTIONS FROM SENATOR BOXER

Question 1. In January, the NRC approved a final rule enhancing the "design basis threat," or DBT, describing the terrorist and sabotage threats against which a nuclear plant needs to defend.

Response. The final rule was affirmed by the Commission on January 29, 2007 and published in the Federal Register on March 19, 2007 (72 Fed. Reg. 12705).

Question 2. Though it did not include a commercial airplane crash scenario in its DBT rulemaking, NRC directed nuclear plants to address impacts from fires and explosions potentially caused by a large plane crash. Is it the case that the protection the Commission is offering the public from an aircraft crash is ensuring the ability for the plant to respond to the aftermath of such a crash?

Response. I would like to begin the response to this question by describing all the different rulemakings underway or recently completed that bear on power reactor security.

The first is the final design basis threat (DBT) rule which you mention (10 CFR 73.1). In that rule the Commission did not include commercial aircraft attacks in the DBT because the DBT is the threat against which licensees must be able to defend with their own resources with high assurance. The weapons needed to defend against terrorist use of a commercial aircraft, such as surface-to-air missiles or fighter aircraft, clearly are not available (and should not be available) to licensee security forces.

The second final rule on which NRC has completed action is our rewrite of 10 CFR Part 52, the rules for licensing new nuclear reactors. That rule at 10 CFR 52.10 reiterates the "enemy of the state" provision that applies to current plants, 10 CFR 50.13.

The third final rule on which the Commission has completed action is 10 CFR Part 26, the Fitness for Duty rule. That rule contains work-hour restrictions for licensee security personnel, which will replace an April 2003 Order when fully implemented. The security force work-hour restrictions have won praise from the Project on Government Oversight, which first brought the issue of security officer fatigue to the Commission's attention in a September 2002 report.

The fourth rule, a rewrite of 10 CFR 73.55 and related provisions, is at the stage of considering public comments on a proposed rule issued last October. It incorporates all of the changes made by the Commission for reactor security following 9/11 through various Orders plus some additional measures, regarding for example, safety-security interface issues. When completed, it will codify in rule text the Commission's reasonable assurance of adequate protection standard for security at both current and future power reactors. Of most relevance to some of your questions, it will codify as part of the licensee's integrated response plan, section B.5.b of the February 25, 2002 Order relating to coping with large fires and explosions that could be generated by a large commercial aircraft impact (at Part 73, Appendix C, Section II (j)(2)(ii)).

The last rule, on which the Commission gave staff its direction on April 24, 2007, is the rule relating to large, commercial aircraft impact assessments for new reactor designs to be included in 10 CFR Part 52. It will be issued as a proposed rule for public comment once the staff completes the direction given by the Commission in its April 24, 2007 Staff Requirements Memorandum.

With that background, let me now answer your first question.

The industry, at the direction of NRC and with insights gained from NRC research, identified and is implementing mitigating strategies, using readily available means, to respond to large fires and explosions from any source to provide reasonable assurance that public health and safety will be maintained. In addition, NRC has a Memorandum of Understanding with NORAD/NORTHCOM that will give warning to power reactors of a potential aircraft attack. Imminent threat procedures are in place at all operating reactors to ensure that upon NORAD warning, the plant can be placed in the safest possible configuration.

Consistent with the Enemy of the State rule, 10 CFR 50.13, which was promulgated in September 1967 to clarify licensee responsibilities in cases such as a Cuban air force attack on the Turkey Point reactor south of Miami, the Commission believes the primary responsibility to defend against terrorist aircraft attacks must remain with the Federal government and notes that DHS, DOD and other agencies have put extraordinary measures in place since 9/11 to prevent terrorist use of large commercial aircraft. The NRC has ensured that should those measures ever fail, and should a terrorist choose a nuclear power plant as opposed to other targets with potentially far greater public health and safety impact, the possibility of significant releases affecting public health and safety has been reduced to very low levels. In short, NRC has ensured that power reactor sites are by far the best protected of

all critical infrastructure sites, and are well prepared to mitigate the consequences of large fires and explosions.

Question 3. As a result of your action on April 24, 2007, the Commission will propose a rule that requires companies to show how or whether their designs for new nuclear reactors would survive in the event of a commercial aircraft crash. What will happen if the company discovers that, if a commercial plane hits a plant, the reactor containment will be breached, or the spent fuel pool and the buildings housing the important safety functions would be damaged? How will the NRC respond to such information under your proposal?

Response. The critical sentence in the proposed rule text for answering your question reads as follows: "The application shall describe how such design features, functional capabilities and strategies, to the extent practicable, avoid or mitigate the effects of the applicable aircraft impact with reduced reliance on operator actions."

The practicability standard had also been included in the NRC staff's version of the rule which the Commission chose not to pursue. As explained in the Chairman's vote, the intent of the "to the extent practicable" term is "to allow designers to incorporate design features which are realistically and reasonably feasible from a technical engineering perspective. This allows designers to evaluate potential competing technical factors, such as the response to earthquakes and passive safety systems, while at the same time addressing aircraft impacts."

NRC staff will independently evaluate each design. Should there be differences with an applicant as to the practicability of certain design features, functional capabilities or strategies, they will be resolved in the design certification rulemaking for that applicant's design.

All Commissioners agree on the characteristics of the applicable aircraft impact to be analyzed. Four Commissioners believe that such a large aircraft impact should remain a beyond-design-basis event, to be treated in a fashion compatible with its approach to beyond-design-basis severe accidents. As the Chairman noted in his explanatory text, for such accidents the Commission's approach (at 10 CFR 50.34 (f)(1)(i)) is to require applicants to "seek such improvements in reliability of core and containment heat removal systems as are significant and practical and do not impact excessively on the plant."

Because Commissioner Lyons independently proposed one of Commissioner Jaczko's five additional acceptance criteria, the Commission instructed the staff in its April 24, 2007 Staff Requirements Memorandum to ask for public comment on that criterion. The additional criterion beyond practicability would read: "The application shall also describe how such design features, functional capabilities and strategies will provide reasonable assurance that any release of radioactive materials to the environment will not produce public exposures exceeding 10 CFR Part 100 guidelines." Should the final rule include that criterion in addition to the practicability criterion, the NRC staff will also evaluate each applicant's design against that criterion in the design certification rulemaking for that design.

Question 4. DOE now intends to submit the final Yucca Mountain license application to the NRC in June 2008. DOE will not have final designs for actual Yucca Mountain facilities, either those above ground or below ground. DOE won't have those designs completed until long after the agency submits the license application to the NRC. DOE insists that preliminary designs are adequate for NRC to approve this complex one-of-a-kind nuclear waste facility. Does NRC share this view?

Response. The NRC does not share this view. The NRC expects the Yucca Mountain License Application to contain sufficient information to allow review of DOE's preclosure safety analysis and total system performance assessment model. Facility design information is the most important input to the preclosure safety analysis. The information should contain sufficient detail to understand the preclosure facilities and operations, including their size, location, arrangements, purpose, and potential hazards. Adequate information on design and operation of the facilities should be provided to enable determination of compliance with the performance objectives and requirements of 10 CFR Part 63, including identification of structures, systems, and components that are important to safety. Consistent with NRC's licensing processes for other areas that we regulate, final detailed designs should not be required to make the necessary safety demonstration per our regulations. In the March 27, 2007 NRC/DOE Senior Quarterly Management Meeting, NRC reiterated the acceptance criteria requirements in 10 CFR Part 63 and the Yucca Mountain Plan, Appendix B, that DOE must address in its license application.

Question 5. DOE's computer model for the Yucca Mountain repository, known as the Total System Performance Assessment simulation program, will form the basis for DOE's license application. It is an extremely complex program that runs on

supercomputers because it is so large. How will the NRC duplicate or confirm the reliability of model's data, and how will this impact NRC's ability to review the license application?

Response. In general, the NRC develops its own computer codes to independently evaluate and perform audit calculations against the applicant's submittal to confirm the results. In the case of Yucca Mountain, NRC has developed the Total-system Performance Assessment (TPA) code that can run on desktop computers. The staff has successfully used the TPA code during the pre-license interactions to identify potential safety issues that DOE needs to address in the forthcoming license application.

In addition, the NRC expects DOE to support its TSPA code in a traceable and transparent manner that will allow NRC to review the technical bases of the models and parameters relied upon to demonstrate compliance with 10 CFR Part 63. NRC review of DOE's TSPA code assessment will focus on confirming that: (1) adequate scenarios were evaluated; (2) models and data represent repository performance; and (3) resulting dose estimates are accurate. NRC will support this review with in-depth evaluation of the scientific and engineering information used in the TSPA model. Using this approach, the NRC does not foresee any adverse impact on our ability to review a potential application for a repository license.

Question 6. In the absence of an NRC-approved license, could DOE start construction of elements of the Yucca Mountain project other than the storage facility itself—items such as roads or rail lines to the site?

Response. Yes. The DOE could begin construction of certain elements of the Yucca Mountain project that are not part of the geological repository operations area such as the roads or rail lines that are located outside the geological repository operations area. The DOE may not begin construction of a geological repository operations area at Yucca Mountain until it has filed a license application and has been granted a construction authorization.

Question 7. Considering new nuclear plant applications, reactor license renewals, and the expected Yucca Mountain license application, NRC will be engaged in a tremendous amount of uncharted territory during the next fiscal year. An increase in fees paid by the nuclear industry under the President's budget will finance some of this new activity. From what funding source will NRC finance its work on the Yucca Mountain license application?

Response. All Yucca Mountain activities are funded by the Nuclear Waste Fund and are not supported by fees collected by the NRC from NRC licensees.

Question 8. In its review of the license application for the Yucca Mountain project, how will the Commission consider safety measures that DOE proposes to implement hundreds of years into the future? For example, DOE is considering requiring "drip shields" up to 300 years into the future to keep water off waste canisters. In the past, NRC has not favorably considered such future actions, does the Commission still hold to that view?

Response. Pursuant to NRC's regulations, DOE must show that the proposed repository will comply with the performance objectives in 10 CFR Part 63 after permanent closure. If DOE files an application and NRC accepts the application for review, NRC will begin a thorough safety review. At that time, the NRC will evaluate whether DOE's proposed design, including reliance on any specific design features or components of the engineered barrier system (such as drip shields) demonstrate that the repository complies with NRC regulations and protects public health and safety and the environment.

Question 9. I understand that while the NRC has provided assistance to the Department of Health and Human Services (HHS) in distributing a new pediatric form of potassium iodide to populations living within 10 miles of a nuclear power plant, the Commission has strongly resisted efforts to expand this distribution beyond the 10-mile radius. Is that the case? If so, on what basis is the NRC resisting a statutorily mandated program?

Response. The NRC has a well-established and scientifically sound framework for nuclear power plant emergency preparedness. This framework includes predetermined protective actions for populations within the 10- and 50-mile ingestion exposure pathway Emergency Planning Zones (EPZs) of commercial nuclear power plants to provide the necessary protection for the thyroid gland from radioactive iodine. In 2001, the NRC revised its emergency preparedness regulations to require that States and Tribal governments having populations within 10-mile EPZs consider including potassium iodide (KI) as a protective measure for the general public as a supplement to sheltering and evacuation in the unlikely event of a severe nuclear power plant accident. As further elaborated below, it is the NRC's conclusion

that expanding the distribution of KI beyond the 10-mile EPZs surrounding nuclear power plants is unnecessary and would not provide a benefit to the public.

NRC analyses indicate that in the event of an emergency at a nuclear power plant that causes a release of radioactive materials, exposure to these materials poses the greatest risk for people closest to the plant. The objectives of the predetermined protective actions within the 10-mile EPZ, which include sheltering, evacuation, and where appropriate, the use of KI, are to mitigate these risks. The population at greater distances from the plant may be at risk of exposure to radioactive materials by way of ingestion, as opposed to inhalation of these materials. Predetermined protective actions for the 50-mile ingestion exposure pathway EPZ include interdiction of contaminated milk, food, and water as well as protective measures for livestock. In January 2004, the National Academy of Sciences (NAS) concluded that, "KI is also effective for protection against the harmful thyroid effects of radioiodine ingested in contaminated milk and other foods, but food testing and interdiction programs in place throughout the United States are more effective preventive strategies for ingestion pathways."

We would note that while the NRC has concluded the expanded distribution of KI is unnecessary, we have worked closely with the Department of Health and Human Services (HHS) to develop guidelines required by the Bioterrorism Act of 2002, for stockpiling and distributing KI beyond 10-mile EPZs. Furthermore, the NRC stands ready to implement the legislative mandate of the Bioterrorism Act, pending a final decision by the Executive Branch on how implementation should proceed.

Question 10. What is your understanding of why HHS has not purchased and distributed potassium iodide sufficient for the populations living within 20 miles of our nuclear power plants as required by the Bioterrorism Act of 2002?

Response. We believe it would be inappropriate for us to comment on this matter because it is the Executive Branch's responsibility, under the terms of the Act.

Qustion 11. Were a nuclear power plant disaster to occur in this country, it could occur anywhere in the United States, at multiple plants, and circumstances could lead to a plume that would spread the disaster well beyond the 20 mile radius of any single nuclear power plant. While I am committed to ensuring that every family within a broad radius of these nuclear facilities has access to pediatric KI, at the very least, would it not make sense for us to be stockpiling significant quantities of potassium iodide at Strategic National Stockpile (SNS) locations, so that potassium iodide could be quickly dispatched to various locations following a disaster and after determination of wind direction and other environmental factors had been made?

Response. As discussed in our response to question 9, there are existing predetermined protective actions for both the 10-mile and the 50-mile Emergency Planning Zones (EPZs) that are considered to be the most effective actions to take in the event of an emergency that causes a radioactive release. Provisions have been made to distribute potassium iodide (KI) within the 10-mile EPZ for those states opting to include KI as an element of their protective actions, so having additional stockpiles would not provide an additional protective measure.

Question 12. The NRC's existing rules prohibit private, off-the-record contacts between Commissioners and interested parties, such as the DOE. These rules are designed to assure fairness and transparency, yet I have heard concerns that the NRC is not following them with respect to the proposed Yucca Mountain project. What is the NRC doing to document its communications with DOE?

Response. If NRC accepts a license application, NRC procedural rules would prohibit DOE or any other interested party to the Yucca Mountain proceeding from having any ex parte communications with the Commissioners or any Commission adjudicatory employee that is relevant to the merits of any contested issue in the proceeding.

The NRC staff has had extensive pre-application interactions with DOE, all in accordance with the staff's open meeting policy and procedures. The NRC staff believes that it has in place appropriate processes for inclusion of the public and, in response to recent stakeholder requests, the staff has invited additional observers to some of our onsite meetings between the NRC representatives and DOE.

Senator CARPER. Mr. Chairman, thanks very much for your statement and for your leadership here.

With that having been said, we will recognize each of the three Commissioners for roughly 3 minutes. Mr. McGaffigan, we will start with you. Thank you.

STATEMENT OF EDWARD McGAFFIGAN, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. McGAFFIGAN. Thank you, Mr. Chairman.

I want to start where the chairman ended. I really appreciate, and I am sure the whole commission appreciates, the efforts that you and Senator Voinovich have put in in the January timeframe to get us the budget we needed. I am convinced that without that support, we wouldn't have had the successful outcome. So I thank you for that.

I also want to join the members of the committee and Chairman Klein in recognizing Commissioner Merrifield's service. We have served over 8 years together on the commission. I think I am the last remaining dog that actually was at Senator Inhofe's first hearing as a Commissioner. I think we have had a unique period, and I hope it is followed up, but we had a unique period where a group of us served for a very long time. We got to understand the problems. We were decisive and action-oriented. We worked on the problems. We sometimes had to make course corrections, but we stayed long enough to see the answers through. I think we have a record of great accomplishment. Jeff has contributed enormously to that record and I will miss him greatly.

I am also going to take just a moment to recognize somebody perhaps not familiar to the members, but familiar to us on our side of the table. Chauncey Starr passed away last week at the age of 95, having worked up until the day he died at the Electric Power Research Institute, which he founded. Dr. Starr was a true giant in the numerous roles he played from the Manhattan Project onward for over 73 years.

The contribution I most want to call attention to is his seminal work in the late 1960s on how to think about acceptable risk. How to answer the question: How safe is safe enough? Unfortunately, the sort of rational analysis of comparative risks that Dr. Starr advocated is often absent in public policy debates, not only in the nuclear sector, but in many other areas as well.

I will stop here. I look forward to your questions, and I wish that we could respond in person to some of the comments made earlier. I doubt the time will allow that, but I stand ready to meet with any member at any time to discuss your concerns.

Senator CARPER. All right, Commissioner McGaffigan. Thank you.

Commissioner Merrifield, a lot of nice things are being said about you today. I would like to say flattery won't hurt you if you don't inhale. So don't breathe too deeply and you should be just fine. All right?

STATEMENT OF JEFFREY S. MERRIFIELD, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. MERRIFIELD. Thank you, Mr. Chairman. Thank you and I thank the members of the committee. It is a pleasure to have the opportunity to appear before you today.

It was about 9 years ago after having served as a counsel for this committee that I began my service as a Commissioner at the NRC. As I prepare to leave the Agency on June 30, I want to say it has been an incredible opportunity to serve this country.

When I first joined the commission, I made a commitment to get out and understand this industry and the impact that the NRC has on maintaining its safety. During my first 3½ years on the commission, I was able to travel to all 104 operating plants in the United States. During almost 9 years I have spent on the commission, I have been to 240 of the world's 440 nuclear power plants in visits to 30 of the 31 countries that operate them.

I would like to take the limited time I have this morning to briefly contrast where this industry and the NRC were situated in 1998, when I joined the commission, and where things stand today.

In 1998, five nuclear units were on the NRC's watch list, and one unit, Millstone Unit 2, was in regulatory shutdown, awaiting NRC approval for restart. The NRC had recently issued one of its largest fines ever, $2.1 million, for, as Senator Lieberman then put it, "the nightmare associated with the three Millstone units."

Four other nuclear powerplants had recently ceased operation, and DOE's Office of Energy Information was postulating the news that as many as 40 percent of the remaining plants may shut down by the year 2010. The capacity of the nuclear fleet was approximately 78 percent, and many of the NRC's then–44 licensees were struggling to maintain capacity and safety factors.

While some utilities spoke about relicensing their reactors, the NRC had not yet completed a single 20-year license extension. During a hearing that EPA convened in July 1998 that was referenced by Senator Inhofe, many Senators complained that the NRC was neither a predictable nor an efficient regulator; that we were not safety-focused; that our internal hearing process was a morass; and that we had lost the faith of the public.

The challenges to this Agency were broad and they were deep. While the hearing discussed the possibility of new reactor orders, no one had a realistic expectation that new orders would mature anytime soon.

Today, we face an entirely different situation. Since the year 2000, only one reactor has been placed in regulatory shutdown and no reactors are currently operating in that situation. No additional reactors have ceased operation, and the operating fleet, as was mentioned, will actually increase by one with the upcoming restart of Browns Ferry Unit 1 later this year.

Concurrent with an increase in safety, capacity factors have been averaging 90 percent over the last 5 years, and during my tenure on the commission, we have granted license extension to almost half of the U.S. nuclear fleet. We have established a solid record as an effective, efficient, and transparent regulator. We are more risk-informed. We place less focus on minor enforcement issues, and overall we have significantly increased our credibility with the public.

The recent approvals of centrifuge facilities in New Mexico and Ohio, which are the first new facilities proposed and licensed by the NRC since Three Mile Island, demonstrate the success of our efforts to improve the timeliness of our internal judicial process.

The actions we took in response to the terrible events of 9/11 were immediate and significant. Not only did the 104 reactors remain the securest element of our civilian energy structure, but the

enhanced requirements we have imposed make us a leader on security in the Federal family.

That is not to say that it has all been easy and without some bumps in the road. No discussion over the last 9 years would be complete without recognizing the significant near miss that we endured at the Davis-Besse site in Ohio. I pause to say, I appreciated the extensive commitment of Senator Voinovich in engaging us on that particular issue. While we all hope this type of event never happens again, I can assure you we have learned from those lessons and they have made us stronger.

We took an agency that had a very poor morale, to one that has been independently judged to be the best place to work in the Federal Government. We have great people, and our staff is doing an outstanding job hiring a diverse, talented workforce for the 21st century. While new plant orders were merely hinted at in 1998, the significant list the chairman outlined today is not only indicative of the enormous potential demand for new units, but in my view, it is also a recognition that the NRC is no longer viewed as a failed regulatory agency.

Mr. Chairman, as mentioned, this may be the last time I appear in public before this committee prior to my departure. I want to leave you with a message that I am proud of the work that I and my fellow members have accomplished over these 9 years. I particularly also want to recognize Ed McGaffigan, with whom I have served during the entirety of that time, who as has been mentioned, I would underscore, is a faithful, dedicated and really someone to be modeled for in the Federal Government service.

Again, thank you, Mr. Chairman. I appreciate your support and the support of Senator Voinovich and the committee as a whole.

Senator CARPER. Commissioner Merrifield, thank you for that statement. Again, thank you for your service. It is a remarkable transition, wouldn't you say, over those 9 years. You have to be proud.

Mr. MERRIFIELD. It is a completely different place.

Senator CARPER. That is true.

Commissioner Jaczko is next. I asked him earlier, I said how do you pronounce your name. He said "Jaczko." I said your name doesn't have a Y in it, and he says that is OK. I said, your name doesn't have a T in it. He said, that is OK. I said, how do you really pronounce your name? He said, "Yaczko." Hasn't anyone ever mispronounced his name? He said, just once or twice.

Thank you. He was kind enough to share with me some of the pronunciations, but he wouldn't share one of them that was his high school coach's. We will have to wait for that one sometime off the record.

Mr. JACZKO. Perhaps it would be better in a closed meeting.

[Laughter.]

Senator CARPER. There you go.

Commissioner Jaczko, welcome. We are delighted that you are here.

STATEMENT OF GREGORY B. JACZKO, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. JACZKO. Thank you, Mr. Chairman.

I would just like to add certainly my agreement with the thanks that the commission has expressed for the committee's support in the budget activities and the capability achieved. I can quote that again it is a very important resource for us as we embark on a significant amount of new work.

I also would like to second some of the comments about Commissioner Merrifield. Jeff was one of the first people that I interacted with when I became a Commissioner. I certainly appreciated his counsel then, and I have appreciated his counsel throughout the time that we have served together. He often mentions that he is the sole attorney on the commission. I think he sometimes undersells his knowledge and expertise of technical issues as well. I continue to be amazed by his de facto engineering status.

Mr. MERRIFIELD. Some of us practice without a license.

[Laughter.]

Senator CARPER. I am sure that is true on this side of the table as well.

Mr. JACZKO. I would say that as far as activities of the commission, I believe, as several members of the committee have said, that in order to accomplish its mission of protecting public health and safety, the NRC needs to be transparent in explaining its processes and open with the public with information as much as possible.

I think we need to have both sound policy decisions that are based on good scientific regulatory and technical information, but we also have to be mindful of public confidence and how the public views the decisions that we make.

During my time at the commission, I have been working to ensure that our Agency works on communicating those decisions better to the public, because I think by communicating better with the public, we will engage the public more and get more public involvement in our decisionmaking processes. I think the result from that will certainly be better policy decisions, and the increased likelihood of further increasing public confidence in the decisions that we make.

I think regardless of how well developed our system might be, and I believe the NRC does have a good system in place for oversight, for inspections, and for other regulatory activities, if we fail to do a good job of explaining it, we can end up with the right answer, but without the public support we need to really move forward successfully with those decisions.

Without good, strong public confidence, we can end up expending resources to approve licenses that never get fully implemented, or that are repeatedly challenged after they are issued. I think that is unfortunately sometimes happening, and I think it is an area where we need to work and continue to focus.

I think the statutory system that has been developed gives us the opportunity to do that. Most of our processes are developed around two important statutes that require tremendous public involvement. We have a hearing process that is required through the Atomic Energy Act, and we use a rulemaking process that requires tremendous public involvement as well.

I believe if we look for new and unique ways to gain further public involvement in those processes, we will only make ourselves a more efficient and more effective regulator in the future.

I would just comment briefly on a few issues that I think the commission has in front of us that are important issues we need to continue to work on. One has to do with an issue that has been addressed about aircraft impact for new reactors. I think the commission has done a good job since September 11 focusing on the existing plants and focusing on important areas of safety.

I think for new reactors, we still have a little bit farther to go. I think the commission yesterday approved a good decision to require assessments for new nuclear powerplants to see how they deal with this threat, but I think the commission stopped short of putting in place some strong standards for how we determine whether or not those designs can address this issue.

The final issue that I would briefly add is that I think the commission still has to work to some extent on improving the quality of applications that are submitted to this Agency. I think we are still getting applications in a variety of areas that don't meet some of the quality standards that we expect. I think improvement in this area would again help improve the efficiency and effectiveness of the Agency.

Thank you.

RESPONSE BY GREGORY B. JACZKO TO AN ADDITIONAL QUESTION FROM SENATOR BOXER

Question. I know you share the view that new nuclear power plants built in the U. S. should be designed to withstand the impact of a large commercial aircraft. I think there should be a two step approach: I agree there should be an assessment of reactor designs, but if the designs are faulty, then the company proposing the design should be required to make all the improvements necessary to address the flaws.

What are the elements you think the Commission should consider in developing a clear substantive requirement that companies need to address design flaws?

Response. I agree it is a vital and necessary step for the Commission to require that new nuclear power plants built in the United States be designed to withstand the impact of a large commercial aircraft. This will ensure protection of the public and provide regulatory stability for applicants who need to know the design standards they will have to meet.

That is why I have proposed adopting actual design standards with clear and transparent criteria that any and all applicants would have to meet. At a minimum, an effective rule would require applicants to perform an assessment which demonstrates the design of their plant would withstand an aircraft impact such that there would be no release of significant quantities of radioactive materials to the environment. In order to comply with this standard, applicants should be required to show that in the event of a commercial aircraft impact, their facilities would demonstrate some or all of the following:

(1) reasonable assurance of the structural integrity of containment, the spent fuel pool and a minimally necessary set of buildings housing the important safety functions;

(2) reasonable assurance there will be no large fires and explosions due to large quantities of fuel leaking into containment, the spent fuel pool and a minimally necessary set of buildings housing the important safety functions;

(3) reasonable assurance of safe shutdown capability;

(4) reasonable assurance that emergency core cooling and residual heat removal systems will continue to function as necessary to ensure continued reactor pressure vessel and fuel integrity; and

(5) reasonable assurance that any release of radioactive substances to the environment will not produce exposures exceeding 10 CFR Part 100 guidelines.

This type of approach is consistent with the manner in which similar issues have been dealt with by previous Commissions. For example, the NRC has established requirements to address events beyond the traditional design-basis, such as transients without scram events, loss of all alternating current, and combustible gas

control. In each case, a significant safety issue was identified, and specific measures for resolving these concerns were added to legally binding regulations.

At this point a majority of the Commission has chosen instead to propose a regulation that contains no standards and requires no design changes. Despite this setback, I appreciate your thoughtful position on this issue and am optimistic that public comment received during the rulemaking will lead the Commission to adopt a reasonable standard.

RESPONSES BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

HUMAN CAPITAL

Question 1. Chairman Klein, I was encouraged to hear that NRC's recruiting efforts have been quite successful, and I am sure that having NRC ranked as the best agency to work for in the Federal government will go a long way in attracting qualified people. But, I am still skeptical about the agency's capacity to respond, especially when considering all the tasks that are coming at you simultaneously: (1) more than 18 COL applications; (2) three design certification applications; (3) two early site permits; and (4) DOE's Yucca Mountain repository application, on top of the routine licensing and oversight work for 103 operating reactors and materials licensees.

Do you believe the agency has the resources necessary to deal effectively with all these high priority tasks in a timely manner? Do you believe adding more resources to the review of new reactor applications will shorten the agency's review schedule?

Response. The Commission believes that we have enough resources to be able to deal effectively with all these high priority tasks in a timely manner, provided that we receive appropriate funding levels. However, there are uncertainties associated with application schedules, and resources needed to review combined license (COL) applications because the COL process has not yet been used. As to increased resources for the review of new reactor applications, some incremental improvements may be possible but these are unlikely to improve dramatically the already aggressive proposed schedules. In addition, certain portions of the review require a certain length of time which cannot be shortened by adding additional resources.

In October 2006, the NRC reorganized and created the Office of New Reactors to review the anticipated new reactor license applications and created the Office of Federal and State Materials and Environmental Management Programs to focus on the increasing number of Agreement States and intergovernmental liaison in the National Materials Program. This reorganization allows the Office of Nuclear Reactor Regulation to maintain focus on the safety of the 104 currently operating reactors and the Office of Nuclear Material Safety and Safeguards to focus on fuel cycle activities. The NRC is aggressively hiring qualified staff, and is developing strategies for contracting support in key technical areas such that resources are available when needed to perform the expected licensing reviews. The planning environment for these licensing activities has proven to be dynamic, as potential applicants have revised or not yet finalized their application schedules.

Question 2. We did get a chance to discuss during the hearing on human capital being a significant challenge not only with the NRC but on a broader scale affecting the entire nuclear field including the utilities, component manufacturers, government agencies, and national laboratories. I am not convinced, however, that government agencies and the industry are taking the problem seriously enough. As I requested during the hearing, I would like to better understand what NRC is doing in terms of outreach to academia. I am also interested in any suggestions you might have on how the government-industry-academia can work together more effectively to meet this challenge.

Response. Data trends confirm that in the short run, demand for skilled individuals is already outpacing the available supply. It is our expectation that as market forces change, the demand will further outpace supply, creating an anticipated shortage of individuals critical to industry and the fulfillment of the mission of the agency. It is in the national interest for everyone, industry and government alike, in anticipation of these shortages to provide augmented funding to support university programs. Early increases in funding can potentially mitigate the long-term impacts instead of waiting for the shortages to occur. Extensive efforts are already underway to increase the talent pool, some as a direct result of the Energy Policy Act (EPA) of 2005.

• In FY 2006, the NRC reached out to academia to stimulate interest in fields of study related to nuclear power by implementing the Nuclear Education Grant

program. The NRC provides grants to support courses, studies, training, curricula, and disciplines pertaining to fields that are important to the work of the agency. The NRC has made available approximately $4.7M to institutions and anticipates that 20 grants will be awarded in FY 2007.

• The Scholarship and Fellowship Program supports students pursuing an education in critical skill areas related to the NRC's regulatory mission. In return, students must fulfill a minimum term of employment with the NRC.

• Through the Minority Serving Institutions Program (MSIP), the NRC establishes and participates in partnership programs with institutions of higher education, including Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs) and Tribal Colleges and Universities (TCUs), to enhance their capacity to train students in fields that are critical to our mission. Programs and activities include: mentoring, leadership, research and development opportunities, program evaluation, training and technical assistance, recruitment and retention initiatives, student tuition assistance, scholarships, and housing.

• The NRC has been working to establish solid relationships with colleges and universities. Agency staff present seminars to students, faculty, placement officials, and on-campus society chapters to inform students and faculty about the agency's mission and how various disciplines are applied at the NRC.

• In FY 2006, the agency established the University Champions (UC) program. The UCs serve as emissaries of the NRC and establish a close individual liaison with the school officials. They participate in meetings with engineering and science department heads, professors, and career counselors, as well as conduct NRC information sessions with students. UCs work closely with the NRC recruitment team to assure highly qualified students have an opportunity to be considered for employment at the NRC.

• In January 2007, Senator Voinovich invited Chairman Klein, along with other senior representatives from academia and industry, to Ohio State University (OSU), to discuss this broad human capital challenge and how to ensure an adequate supply of graduates ready to pursue advanced careers in nuclear engineering, health physics, and other disciplines critical to the nuclear field. Other Commissioners speak at colleges and universities in an effort to generate interest in employment at the NRC.

• As part of our ongoing recruitment efforts, NRC participates in numerous events sponsored by colleges, universities and professional organizations. These efforts support the immediate hiring of our full-time workforce and provide outreach for programs such as cooperative education, internships, and summer employment which support our long-term skill needs.

PUBLIC CONFIDENCE

Question 3. There was a good discussion during the hearing about whether or not NRC should invite outside observers from State and local governments and NGOs to observe NRC's inspections. It appears to me that one of the reasons for those folks who are advocating for an "Independent Safety Assessment" is the perception that NRC inspections are conducted in a shroud of secrecy. Could you please provide for the record the NRC's process for getting State and local government officials involved in NRC inspections? Could you also please provide recent examples where outside observers have participated in NRC inspections?

Response. The NRC has a long-standing policy of permitting State representatives to observe NRC inspections. The policy entitled, "Cooperation With States at Commercial Nuclear Power Plants and Other Nuclear Production or Utilization Facilities," issued in 1992 (57 FR 6462), sets out the general framework for NRC's cooperation with States, including keeping the States informed of issues in a timely manner and establishing the process for States to either observe or participate in NRC inspections. NRC staff procedures relating to this policy can be found in the NRC Management Directive 5.2, "Memoranda of Understanding With States" which is available on the NRC website. This staff procedure forms the basis of an effective means of outreach for outside observers from State and local governments to observe NRC inspections.

A central purpose of these policy initiatives is to dispel any perception that there is of a shroud of secrecy regarding NRC's inspection process. Effective and open communication with Federal, State, and local governments, interstate organizations, and Native American Governments is an agency goal, and the Commission recognizes that stakeholder outreach is an important factor in building and maintaining public confidence in NRC regulatory policies and programs. The NRC will continue close coordination of our activities with Federal, State, and local elected officials,

and we remain focused on a number of reviews and initiatives to help us understand and address the specific needs of the communities around sites.

You asked for specific examples where outside observers have participated in NRC inspections. The NRC regional staff routinely notify appropriate State officials of planned NRC inspections. The purpose of this prior notification is to facilitate State observation of an NRC reactor inspection. We believe that our processes help build NRC public credibility about the NRC reactor inspection process. Specific examples of state involvement in NRC inspections activities follow:

• Representatives from the State of New Jersey observed Problem Identification and Resolution inspections at the Oyster Creek plant in May 2006, and at the Salem Generating Station in March 2007. In addition, representatives from the State of New Jersey accompanied NRC inspectors in March 2006, during a Triennial Fire Protection inspection at the Salem Generating Station and during License Renewal inspections in March and December of 2006, at the Oyster Creek plant.

• Members of the Pennsylvania Department of Environmental Protection accompanied inspectors during the Triennial Fire Protection inspection, in December 2005, at the Three Mile lsland station. Additionally, Pennsylvania Department of Environmental Protection staff observed Biennial Exercise Inspections at the Three Mile Island station in May 2005 and April 2007. Emergency Preparedness inspections at the Beaver Valley site were observed by representatives of the States of Pennsylvania, Ohio and West Virginia in June 2006.

• A State of New Mexico Environmental Scientist accompanied NRC inspectors during a construction oversight inspection at the Louisiana Enrichment Services fuel cycle facility located near Hobbs, New Mexico during the week of December 11, 2006.

• The State of Ohio has been an active observer of NRC inspections for years, particularly at the Perry and Davis-Besse nuclear power plants. A number of State agency representatives, including some from the Ohio Department of Health and the Ohio Emergency Management Agency, have observed NRC inspections.

• The Vermont Department of Public Service employed a State Nuclear Engineer, who observed NRC reactor inspections whenever he was available. These interactions continue today, and NRC maintains close coordination with Vermont on observation of inspections at Vermont Yankee.

• A New Jersey (NJ) Department of Environmental Protection, Bureau of Nuclear Engineering employee has been an active participant in monitoring conditions at nuclear power plants within NJ. The NRC follows a historic letter agreement with the State of NJ which establishes the protocol for State surveillance at Salem, Oyster Creek and Hope Creek nuclear power plants. This protocol defines the responsibilities of the NJ Bureau of the Nuclear Engineering employees and the NRC, and is similar to the Commission Policy. NJ Nuclear Engineers routinely accompany NRC staff on inspections, and the State has engineers assigned to each site.

• Indian Point was the subject of considerable discussion during the hearing. The NRC continuously reaches out to State and local governments and members of Congress to keep all parties informed about site developments. A New York Department of Public Service staff engineer has the responsibility to observe and accompany NRC inspectors on occasion. Also, the New York Department of Environmental Conservation and the Department of Health routinely accompany NRC inspectors at the Indian Point facility.

• With respect to Tribal Nations, in Minnesota the NRC maintains close communication with the Prairie Island community regarding the Prairie Island Nuclear Power Plant. Because of interest expressed by the Community, the Commission determined that representatives from the Community may observe NRC inspections at the plant if the Community meets the same requirements that an Adjacent State must meet as specified in the Commission's policy on State cooperation. In addition, information related to the Prairie Island nuclear power plant is provided to the Tribal Government. Tribal members have observed NRC inspections on multiple occasions.

• NRC has two Memoranda of Understanding (MOU) with the State of Illinois to participate in NRC inspection programs. One MOU allows a State resident inspector to perform inspections in cooperation with the NRC resident inspectors at nuclear power plants in the State of Illinois. The Illinois resident inspector may observe NRC inspections and participate in NRC's inspection program. The Illinois State resident inspectors can perform inspections on behalf of the NRC, but under the MOU, provide their inspection results to the NRC for appropriate action and enforcement. Illinois is also allowed to perform joint boiler and pressure vessel team inspections at nuclear plants in Illinois under a separate MOU. The Illinois program is funded under a State fee system imposed upon the operating nuclear power plants in Illinois.

• The Commonwealth of Pennsylvania maintains a robust nuclear engineering program that is similar to the one in Illinois. Pennsylvania has separate agreements with each of the nuclear operating companies that permit access and facilitate a State presence at each reactor. Pennsylvania has resident inspectors who monitor licensee activities and report back to the Pennsylvania Department of Environmental Protection. These inspectors routinely accompany NRC staff on inspections, and provide valuable input to the NRC oversight program.

A more comprehensive list of Memorandum of Understandings with States can be found on the NRC website.

Question 4. From your testimony, I understand that NRC's Reactor Oversight Process is a continual set of inspection procedures that occurs at each nuclear power plant whereas an Independent Safety Assessment is a "snapshot" of a limited period of time at a specifically selected plant. Both essentially inspect the same processes, activities, and equipment. Is this correct and could you elaborate on these two activities?

Response. You are correct. The staff performed a careful and thorough comparison of the Independent Safety Assessment (ISA) conducted at Maine Yankee to the inspections conducted at all nuclear power plants in accordance with the Reactor Oversight Process (ROP) to identify any gaps. The staff concluded that, on an ongoing basis, the current ROP inspections and regulatory framework effectively examine the same key aspects of plant safety as did the Maine Yankee ISA. However, the current ROP is a more thorough process to assess plant safety, with better focus on potentially risk-significant problems.

The Maine Yankee ISA that was performed during three months in 1996, was, at that time, unique in its scope, inspection team composition, and in its coordination with state representatives. The NRC conducted the ISA in response to a specific set of circumstances associated with allegations made about the facility's power uprate application. The regulatory oversight program at that time allowed for special inspections as a part of the process, called Diagnostic Evaluation Team (DET) inspections. The ISA was a modified DET that added a detailed review of analytic codes for transient and accident safety analyses. It focused on conformance of the facility to its design and licensing bases, operational safety performance, licensee self-assessments, corrective actions and improvement plans, and determination of the causes of safety-significant findings. The use of application analytic codes was not typically inspected as part of the NRC regulatory process at the time, and additional focused resources were applied to this area. However, review of the codes was necessary to address the allegations made against the licensee.

The NRC Reactor Oversight Process is anchored in the NRC's mission to ensure public health and safety in the operation of commercial nuclear power plants. The ROP is designed to focus agency resources on those plant activities most important to safety. It is also designed to be objective and predictable; that is, if two plants exhibit the same performance, they will receive the same level of regulatory oversight. The oversight process collects information from inspections and performance indicators to enable the NRC to arrive at conclusions about the licensee's safety performance which are as objective as possible.

Based on this information, the NRC determines the appropriate level of agency response. If plant performance declines, the NRC increases plant oversight, including increasing the number of inspections, scheduling supplemental inspections focusing on areas of declining performance, and taking pertinent regulatory actions ranging from management meetings up to and including orders for plant shutdown. The process uses five levels of regulatory response with NRC regulatory review increasing as plant performance declines. The first two levels of heightened regulatory review are managed by the appropriate NRC regional office. The next three levels call for higher level agency response, and involve senior management attention from both headquarters and regional offices. The scope of inspections is driven by plant performance. A poor performing plant having multiple or long-standing significant issues will be inspected using a procedure which incorporates processes and techniques originally used in the previously mentioned Diagnostic Evaluation Team (DET) process that was applied at Maine Yankee.

Even if there are no earlier signs of declining plant performance, if a plant experiences operational problems or events that the NRC believes require greater scrutiny, the NRC will perform additional reactive inspections as part of the ROP. In some instances where increased oversight beyond what is prescribed by the ROP is appropriate, the NRC may require additional inspections beyond what is called for by the ROP.

RESPONSES BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR CRAIG

Question 1. The 2005 Energy Policy Act outlined the development of a licensing strategy for the Next Generation Nuclear Plant (NGNP) Project. What is the status of your discussions with DOE on the licensing strategy?

Response. A Memorandum of Understanding (MOU) between the NRC and DOE was implemented on October 13, 2006, to facilitate the two agencies' working together to develop the NGNP licensing strategy as outlined in the 2005 Energy Policy Act. A joint licensing strategy working group comprised of NRC and DOE staff was formed shortly thereafter. The group has had several working meetings to date, addressing the scope of the licensing strategy as outlined in the Act. Specifically, the group is developing licensing approach options for NGNP in which current NRC light water reactor (LWR) licensing technical requirements will be adapted for NGNP (currently considered to be a very high temperature gas-cooled reactor type) while making use of probabilistic methodology and risk information as called for elsewhere in the Act. NRC staff, with appropriate participation from DOE, are also working on identifying analytical tools that the NRC will need to develop to independently verify the safety performance of NGNP, and other research and development activities the NRC will need to conduct to review an NGNP license application.

Question 2. Will you be ready to present to Congress your licensing strategy for NGNP next year, as outlined in the Energy Policy Act?

Response. Yes. The Act requires that the licensing strategy be developed and presented to Congress jointly by the NRC and the DOE. We have made sufficient progress to date which gives us the confidence that we can meet the congressionally-mandated schedule.

Question 3. The Energy Policy Act calls for ongoing interaction between DOE and the NRC on the NGNP project. Are your two agencies interacting on this project, if yes how and if not why not?

Response. Yes, the two agencies are working very closely on the development of the licensing strategy, and the interaction is excellent, as indicated in the response to Question 1. There is a second form of interaction outlined in the Act which addresses DOE's solicitation of NRC participation, in a review and advisory role, in DOE-initiated and sponsored research and development activities involving NGNP and high temperature gas reactors conducted at various national laboratories and other institutions. This interaction is in the early stage of development, and both agencies are working together to enhance cooperation in this area.

RESPONSES BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR SANDERS

Question 1. In June 2006, Senator Jeffords asked at the Environment and Public Works NRC Oversight hearing about the April 2005 GAO report. That report discussed, among other matters, the loss of spent fuel rods at Vermont Yankee in 2004. The GAO report recommended that the NRC establish requirements for the control of loose fuel rods and develop inspection procedures to verify plants' compliance. The NRC wrote to Senator Jeffords in 2005 saying that it was addressing the GAO's report. However, by the 2006 hearing, little progress in actually implementing these recommendations had been accomplished.

What progress has been made to address the GAO's findings?

Response. Substantial progress has been made in implementing the recommendations in the August 2005 GAO report. The NRC requirements for the control and accounting of loose fuel rods are established in Title 10 of the Code of Federal Regulations, Section 74.19, which states, in part, that each licensee is required to keep records of receipt, shipment, disposal, and inventory (including location) of all special nuclear material (SNM) in its possession and to perform annual physical inventories of all SNM. Special Nuclear Material includes irradiated nuclear fuel in all forms, including loose fuel rods and pieces.

In 2005, the NRC issued an inspection procedure, "Spent Fuel Material Control and Accounting at Nuclear Power Plants," to verify licensee compliance with these requirements. By the end of July 2007, the NRC will have completed detailed inspections of the Material Control and Accounting (MC&A) programs at all 65 operating power reactor sites, three decommissioning reactors, and four wet storage sites.

In 2006, the NRC issued an Information Notice (IN) 2006-25: "Lessons Learned from NRC Inspection of Control and Accounting of Special Nuclear Material at Commercial Nuclear Power Reactors," to inform the industry of lessons learned from the

recent inspections of MC&A programs for SNM at commercial nuclear power plants. The Information Notice also clarified regulatory requirements regarding the control and accounting of SNM. Information contained in IN 2006–25 is consistent with the guidance contained in the American National Standards Institute (ANSI) Standard N15.8–1974, "Nuclear Material Control Systems for Nuclear Power Plants." This standard, as well as applicable inspection procedures and guidance documents will be updated to reflect lessons learned once all the MC&A inspections are completed later this year.

Question 2a. The NRC has lost the confidence of much of the public. Last year, Senators Durbin and Obama introduced legislation to address safety issues related to chronic groundwater leaks from nuclear power plants in Illinois. This year, Senator Clinton introduced a safety assessment bill focused on issues at Indian Point, And, as you how, I have introduced a bill, S.1008, to enable States to obtain independent safety assessments of nuclear plants.

In addition to the federal action, the State of New Jersey, Vermont, and Massachusetts have legally intervened against the NRC in power uprate and/or license renewals of nuclear plants in their states. Then, too, the local governments around the Shearon Harris nuclear plant in North Carolina have formally pleaded with the NRC to enforce fire protection regulations.

Doesn't history strongly suggest that the public, including government officials on the national, state, and local levels, have lost confidence in the NRC?

Response. No, the NRC is an independent regulatory agency that has justifiably earned the public's confidence as a responsible and effective regulator.

Question 2b. What steps has the NRC planned to restore public confidence in the agency?

Response. As stated earlier, the NRC has earned the public's confidence. If you are aware of specific concerns that the public has about the agency, we encourage you to bring them to our attention, or ask your constituents to contact the agency directly. NRC welcomes public feedback and will take appropriate actions to address concerns.

Question 2c. Would you be willing to conduct an independent safety assessment, similar to the Maine Yankee assessment, on 2006's worst performing nuclear units, to demonstrate the effectiveness of, and to inspire public confidence in the ability of the Reactor Oversight Program (ROP) to catch all the major problems? Could you address the expressed concerns of citizens, local, state and federal officials in New York and Vermont by conducting such an independent safety assessment at the Indian Point and Vermont Yankee nuclear facilities?

Response. The Commission does not believe there is a need to conduct additional safety assessments similar to the Maine Yankee assessment. The current Reactor Oversight Process (ROP) baseline inspections and regulatory framework effectively examine the same key aspects of plant safety as did the Maine Yankee Independent Safety Assessment (ISA), but with greater attention to safety culture and better focus on risk-significant activities. The ROP is designed to be objective and predictable and to increase regulatory oversight if plant performance declines. Poorly performing plants having multiple or long-standing significant issues are inspected using processes and techniques originally used in the previous inspection process that was applied at Maine Yankee. Therefore, additional ISA type inspections for poorly performing plants are not necessary.

The NRC developed regulatory process allows for public comment in various forums including the annual public plant assessment meetings. In addition, the NRC has a long-standing policy on cooperation with States, permitting State representatives to observe NRC inspections, including upcoming license renewal inspections at Indian Point. The NRC would be glad to discuss the full extent to which State representatives could observe our inspections going forward. We believe such observations by independent State representatives would validate the depth, breadth, and thoroughness of our inspection efforts at nuclear power plants.

Question 3. It is reported that during the first few years of the Reactor Oversight Program (ROP), NRC conducted surveys of NRC staff regarding confidence in the ROP. The surveys had decidedly mixed results with numbers of staff approximating 50 percent indicating their belief that the ROP was reducing, not increasing public safety. Please provide a copy of this survey.

Has NRC conducted more recent surveys to determine staff confidence in the ROP?

Response. The NRC conducts biennial internal surveys to solicit and analyze feedback from NRC staff regarding the effectiveness of the ROP. The staff's evaluation of the feedback is included in a Commission paper on the results of the staff's an-

nual self-assessment of the ROP (SECY 07–0069, Enclosure 3). There have been five internal surveys to date and the results of each survey and assessment are available on the NRC's public website. Consistent with the biennial frequency, the staff plans to conduct its next internal survey in the fourth quarter of 2008.

The staff's confidence in the ROP increased notably after the first few years as noted in Attachment 1 to SECY–01–0114, "Results of the Initial Implementation of the New Reactor Oversight Process." The staff's evaluation of the survey results concluded that: "Although some NRC inspectors may have initially indicated skepticism of the significant changes being brought about by the new program, the end-of-program 2001 survey indicates a much higher level of acceptance, and a better understanding and familiarity with the ROP. The 2001 survey data indicates that generally NRC internal stakeholders who have been involved with the implementation of the new program and are familiar with its processes have more positive acceptance than those who were surveyed after the pilot program initiative in 1999." Specifically, the survey results indicated that: "The majority of respondents to the 2001 survey agreed that the ROP provides appropriate assurance that plants are being operated safely (88 percent in 2001 vs. 49 percent in 1999) and that the ROP provides appropriate regulatory attention to licensees with performance problems (74 percent in 2001 vs. 41 percent in 1999)." The majority of the other questions for the 2001 survey had significant increases in positive response percentages as well. The most recent internal survey in 2006 (SECY 07–0069, Enclosure 3), showed that 90 percent of the staff agreed that the ROP provides appropriate assurance that plants are being operated safely and 87 percent agreed that the ROP provides appropriate regulatory attention to licensees with performance problems.

Question 4. In 2002, a power uprate in Illinois resulted in severe vibrations that caused a series of shutdowns and the replacement of a severely damaged steam dryer in 2004. In the spring of 2005, NRC staff undertook a project to gather information regarding equipment failures at nuclear plants that had undergone extended power uprates (EPU), as had been granted at Vermont Yankee, in order to determine if there were failures generic to EPU.

- What is the status of that project?
- When will it be completed?
- When will the data be available to the public?

Response. The information gathering for the boiling-water reactor EPU study has been completed and documented in a report which is expected to be issued by August 31, 2007. The report will be made publicly available.

Question 5. The following exchange took place between Congressman Ed Markey and the NRC at an NRC Authorization Hearing April 17, 1985:

> Question 21: Chairman Markey: "What does the Commission and NRC staff believe the likelihood of a severe core melt accident to be in the next 20 years for those reactors now operating and those expected to operate during that time?
>
> Response. ". . . THE CRUDE CUMULATIVE PROBABILITY OF SUCH AN ACCIDENT WOULD BE 45%."

Our nuclear reactors are now 22 years old. Do you have an update on this assessment?

Response. As you may know, the 1985 answer, a small portion of which you selectively quote, was in response to a pre-hearing question submitted by Congressman Markey. There were caveats offered by Chairman Palladino, by Commissioner Asselstine, as well as by the staff that your excerpt leaves out. The questioning at the 1985 hearing itself led to further discussion of the problems with the estimate, including that it was based on a very limited number of crude probabilistic risk assessments then available. Chairman Palladino flatly stated that "Had I had more time, this answer would have been written differently."

A mechanistic calculation based on often outdated and incomplete estimates of core damage frequency at the existing 104 operating plants would be both inaccurate and misleading. To put this in context, current probabilistic risk assessments (PRAs) have a wide range of quality. They are all much better at determining the marginal impact on core damage frequency of a proposed change in equipment or procedures (i.e., calculating differentials) than at summarizing the core damage frequency of all possible scenarios, whether generated by internal or external events and in various modes of operation (i.e., calculating integrals). Such comprehensive up-to-date PRAs still do not exist for the operating plants, although they will be required for new reactors. For these reasons, NRC's efforts to risk-inform our regulatory processes rely on NRC's traditional deterministic approach augmented by risk insights, where appropriate.

One central performance measure for NRC in the reactor arena is a goal of zero significant precursors per year. A significant precursor is an event with a greater than one in a thousand conditional core damage frequency. NRC annually summarizes all events with greater than one in a million conditional core damage frequency. We have achieved the zero significant precursor goal each of the last 10 years except for the Davis-Besse event of 2002. That event was calculated to have a conditional core damage frequency of six chances in a thousand during the year preceding discovery of the head damage by our accident sequence precursor program. We never want to see such an event again, but that was still a factor of about 170 from a small break loss of coolant accident, which would have been well within the design basis of the plant, and, had it occurred, should have had no off-site health and safety public consequences.

NRC cannot promise perfection in the pursuit of safety at the 104 operating reactors. But we proactively react to every significant anomaly that occurs, to ensure the reason for the anomaly is identified and adequately addressed. The industry itself has achieved levels of performance not dreamed of in 1985 in every NRC performance indicator. Various NRC rule changes, such as the Maintenance Rule, the Station Blackout Rule, the 1999 amendment to the Maintenance Rule dealing with on-line maintenance, have significantly improved safety and led to lower estimates for conditional core damage frequencies. The security measures which the Commission put in place starting in February 2002 will, when factored into PRAs, have significant safety benefits which are not factored into today's PRAs.

The focus of the Commission is constantly on improved safety for these plants. The metrics we use, such as the goal of zero significant precursors each year, are the right performance metrics. The reactor oversight process (ROP) is the right tool to use to find outliers within the 104 plants and give them the extra attention they deserve. We are committed to constant improvement in the ROP, including both revised performance indicators and new inspection modules in areas as diverse as engineering and human performance.

The plants may be 22 years older, but by every measure they are enormously safer today. NRC intends to keep it that way.

Question 6a. Aging Plants and License Renewal.—In 2004 at Vermont Yankee, a transformer fire, hydrogen burn, and emergency shutdown of nuclear reactor (SCRAM) occurred. The licensee reported that this happened due to an increase in airflow through a duct (in anticipation of the uprate) and other aging-related factors.

What does the NRC do to confirm the licensee's conclusion?

Response. In general, whenever events or potential safety issues are identified at a licensee's facility, the NRC takes immediate action to assess the significance of the situation and evaluate the licensee's response to address the situation. The NRC evaluates the licensee's root cause analyses and corrective actions and will question the licensee, as necessary, to ensure that all safety issues have been resolved.

With respect to this specific event, the NRC on-site resident inspector immediately responded to follow the licensee's actions and the NRC initiated a comprehensive review of the event beginning with on-site inspection activities on June 18, 2004. The NRC inspection activities included an assessment of the licensee's immediate response to the event, monitoring of its event investigation and root cause determinations, and a review of the corrective actions to confirm that any actions needed to assure the safe operation of the plant were accomplished prior to startup.

Question 6b. How does the NRC factor this into the license renewal process?

Response. The requirements for license renewal are based on the following two fundamental principles:

1. The regulatory process for nuclear power plants is adequate to ensure that currently operating plants will continue to maintain adequate levels of safety during the period of extended operation, with the possible exception of detrimental effects of aging on certain systems, structures and components, and a few other issues that may arise during the period of extended operation; and

2. Each plant's licensing basis is required to be maintained during the renewal term in the same manner and to the same extent as during the original licensing term.

The first principle recognizes that the regulatory process provides assurance that plants are currently operating safely and will continue to do so in accordance with the plant's licensing basis. The licensing basis for a plant does not remain fixed for the term of its operating license. It continues to evolve throughout the term of the operating license because of the continuing regulatory activities of the NRC, as well as the activities of the licensee.

The second principle of license renewal is that the plant's licensing basis, though possibly evolving, must continue to be met in the period of extended operation. This requirement will ensure that any actions taken in response to the operating event continue to be implemented after license renewal.

The focus of the license renewal review is on passive long-lived systems, structures, and components for which the effects of aging may not be as readily detectable by existing programs. The review also includes time-limited aging analyses that are related to safe operation of the plant and are based on the original operating term of 40 years. The licensee must demonstrate that there is reasonable assurance that the detrimental effects of aging on the functionality of systems, structures, and components will be managed and that time-limited aging analyses have been evaluated such that the plant will continue to operate safely in compliance with its licensing basis.

In establishing the requirements for license renewal, the NRC determined that the detrimental effects of aging in active components such as transformers, are more readily detected and corrected by routine surveillance, testing, and maintenance and/or replacement programs. These programs for active components are required throughout the original license term and will continue throughout the period of extended operation resulting from license renewal. Therefore, active components do not require additional review specific to the license renewal process.

Regarding operating events such as the referenced transformer fire, a licensee's corrective action program and the NRC's regulatory oversight will ensure that operating events are evaluated and any needed corrective actions taken. All changes required at the plant as a result of this evaluation become part of the plant's licensing basis.

Question 7. In testimony given on April 25, 2007, the Commissioners congratulated themselves for addressing the issue of the possibility of air attacks on nuclear facilities. In fact, the Commission voted to require designers to "consider" whether there are design enhancements they might be willing to make, rather than requiring new reactors to be designed to withstand the crash of a large aircraft, such as occurred on 9/11.

What was the basis for Commissioner Jaczko's dissent and what was the basis for the majority to dismiss these concerns?

Response. The Commission majority does not believe that your question properly characterizes the April 24, 2007 Commission direction. For example, the word "consider" does not appear in the proposed rule text. As we described in our response to Senator Boxer's question #2, the critical sentence in the rule text prescribes a "practicability" standard. The NRC staff will independently evaluate each applicant's design. If there are differences between the staff and an applicant over the practicability of design features, functional capabilities and strategies to avoid or mitigate the effect of the applicable aircraft impact with reduced reliance on operator actions, they will be resolved in the design certification rulemaking for that applicant. We would refer you to the more comprehensive discussion on the Commission majority's position in our response to Senator Boxer's second question.

As indicated in his publicly available vote sheet for Proposed Rulemaking-Security Assessment Requirements for New Nuclear Power Reactor Designs, Commissioner Jaczko's response was based upon his belief that the proposed approach did not include a regulatory standard that would require the inclusion of design features to minimize the damage caused by a large commercial aircraft crash. Commissioner Jaczko stated that the proposal would place the agency in the untenable position of providing hints and suggestions for applicants and vendors to consider, and then hope their self-interest would encourage them to make the necessary improvements.

The majority of the Commission believes that this is not the case. The new rule is intended to require nuclear power plant designers to perform a rigorous assessment of design features that could provide additional inherent protection to avoid or mitigate the effects of an aircraft impact, while reducing or eliminating the need for operator actions, where practicable.

RESPONSES BY GREGORY B. JACZKO TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. What has the NRC done to prepare for the COLs (combined licenses) and how long will it take you to process them?

Response. In addition to reorganizing the agency as described in response to Senator Voinovich's first question, and making major "streamlining" changes to NRC's hearing procedures in 2004, the staff developed a review process titled, "design-centered review approach," to review the expected combined license (COL) applications.

A standardized, uniform, design-centered approach to both COL application development and NRC review is expected to significantly enhance effectiveness and efficiency.

The Commission recently approved a revision to 10 CFR Part 52. Thus, the staff is making conforming changes throughout the NRC's regulations in addition to updating the regulatory infrastructure necessary to review and process new reactor applications for light water designs (including contents of a COL application). These activities will enhance the NRC's regulatory effectiveness and efficiency in implementing its new reactor licensing processes, and allow applicants to provide focused and complete applications that will minimize the need for supplemental information.

Industry currently is expected to submit 19 COL applications during the next two years. The New Reactor Licensing Program Plan (LPP) is being developed and intended to be used as an internal project management (planning and scheduling) tool. Specific review schedules for individual applications will be determined when applications are docketed, and will consider factors such as degree of standardization, technical acceptability, and completeness of the application. Once the application-specific acceptance review is completed, review schedules will be shared with the applicant and also published on the NRC website. The LPP not only schedules the COL activities, but also the review of the three design certifications, and the three early site permits that are currently being reviewed or will be reviewed.

A COL application is estimated to be reviewed and completed in approximately 30 months, plus the time needed for the hearing process.

Question 2. How important is the guaranteed loan program to building new nuclear reactors?

Response. A large percentage of NRC costs are recovered through fees that are charged to licensees. No utility has announced that it is committed to building a plant. To date, the industry has only announced that it intends to submit a number of license applications which are a relatively small cost in comparison to the total cost of bringing new generation on line. Until announcements are made that a utility will build a new plant, the NRC cannot speculate on the importance of the guaranteed loan program.

Question 3. The "Part 52 Rule," for early site permits has taken longer than expected. Have you looked critically at the NRC processes to determine where bottlenecks occurred and what can be done in the future so it's not repeated?

Response. The NRC performed a critical review of its rulemaking process in 2006, and the Commission approved implementation of several measures to improve the efficiency and timeliness of the process. A number of these measures were implemented in the late stages of the rulemaking on 10 CFR Part 52. However, some of the efficiencies gained were offset by a substantial amount of stakeholder involvement in the late stages of the rulemaking. The NRC continues to look for further efficiencies in the rulemaking process and will, as it did in the case of the Part 52 rulemaking, continue to balance the need for efficiency with the need to address the increased involvement of external stakeholders in the rulemaking process.

Question 4. Do you need more resources or legislative help to process and move forward on the Yucca Mountain permit?

Response. Existing law provides a sufficient legislative framework for the NRC to begin the review of the Yucca Mountain license application. If the resources requested by the NRC are provided, the level of funding should be adequate.

Question 5. You have recently hired a number of new employees, and you have plans to hire even more in order to move forward on the next generation of nuclear reactors. How is the current market for nuclear professionals? Will the NRC and industry be able to find enough qualified individuals?

Response. NRC's hiring program is currently successful in replacing retiring employees and hiring additional staff to support new work. We exceeded our FY 2006 hiring goal and we are well on our way to meeting our FY 2007 goal. The agency anticipates having critical hiring needs for the next several years. While we are positioned to meet our hiring goals in the short term, NRC will have the ongoing challenge of maintaining our recruitment pace and successes.

The Oak Ridge Institute for Science and Education (ORISE) data reflects substantial increases in nuclear engineering enrollments and degrees, although the number is still substantially lower than the numbers in the mid-1990s. ORISE data also confirms that the available U.S. civilian labor supply of new nuclear engineering graduates and health physicists is substantially less than the number of job openings. For example, there are 1.5 to 2.5 job opportunities per available health physicist graduate and over two job openings per nuclear engineering graduate available.

This is so even though there has not yet been a rapid increase in retirements or industry growth.

These data trends confirm that in the short run, demand for skilled individuals is already outpacing the available supply. It is our expectation that as market forces change the demand will further outpace supply creating a shortage of individuals critical to industry and the fulfillment of the mission of our agency. It is in the national interest for everyone, industry and government alike, in anticipation of these shortages, to provide augmented funding to support university programs. Early increases in funding can potentially mitigate the long-term impacts instead of waiting for the shortages to occur.

As mentioned previously in our response to Senator Voinovich's second question on human capital, NRC participates in numerous events sponsored by colleges, universities and professional organizations. These efforts support the immediate hiring of our full-time workforce and provide outreach for programs such as cooperative education, internships, and summer employment which support our long-term skill needs.

NRC will continue to adjust our human capital strategies to maintain our technical knowledge and skills. These include maintaining a vigorous and successful recruitment program and utilizing fully the provisions of the Energy Policy Act of 2005.

Question 6. It is my understanding that some of the large generators and other equipment needed to build a new reactor are not built in the U.S. How does the world-wide market look? Will the necessary parts and equipment, not to mention the nuclear material be available to construct all of the plants being considered?

Response. In response to changes in the manufacturing sector since the last large-scale construction of domestic nuclear power plants, new reactor construction will require a shift from a mostly domestic to a broader, international market for the design, engineering, and fabrication of key equipment and components. As the nuclear power industry proceeds with its plans to build new units in the United States, and as other countries begin to compete for similar, key nuclear components from the same limited suppliers, supply will be outpaced by demand such that backlogs and long lead times may occur.

The NRC will closely monitor industry activities and will provide enhanced oversight of key nuclear component suppliers around the world to ensure that the high quality assurance standards demanded for the U.S. nuclear industry are maintained.

Senator CARPER. Commissioner Jaczko, thank you very much.

We welcome Senator Clinton. You are welcome to make a comment or two if you would like, and then we are going to start the 7 minute question period. But if you would like to say something, feel free.

STATEMENT OF HON. HILLARY RODHAM CLINTON, U.S. SENATOR FROM THE STATE OF NEW YORK

Senator CLINTON. I just want to thank the chairman and the Ranking Member, and thank the members of the commission. Mr. McGaffigan, it is great to see you here. I am pleased to have this chance to participate in this hearing.

I have a number of questions that go to some of the decisions that the NRC has been making, with particular respect, as all of the Commissioners know, to Indian Point, which I think is an exception to a lot of the rules that have been made. So we will get to those questions during the question time.

Senator CARPER. Thank you.

Senator Voinovich was going to ask you a bunch of questions, I suspect, with respect to human resources and your ability to provide the human resources to meet the challenges that lie ahead.

I just want to ask one that kind of relates to this. I don't want to get on his turf, but, Senator Clinton, we were just talking about how the commission has been recognized as the best place in the

Federal Government to work, which is a high honor. They have a huge challenge in terms of staffing up to meet the workload that lies ahead.

My question relates to how you won the honor, how the commission won the recognition as the best place in the Federal Government at which to work. How did you get there? It is important that you stay there, because you need to to be able to attract the best and brightest to meet the challenges that you face. But how did you get there? How do you plan to stay there?

Mr. KLEIN. Mr. Chairman, I think we have a lot for reasons of how we got there, but it took a culture of openness. In terms of what we do is we hire good people. We train them. We make our expectations clear. So we have a good communication plan, and the fact that we are an open agency I think helps in that regard.

I think most importantly, we always talk about a communication plan, but I think what we have at the Agency is a listening plan. We listen to our employees. We care about our employees and we try to take good care of them. So as I had indicated when I represented the Agency to receive the award, that next year we want to be first in the Nation, not just in Federal Government, so we intend to both maintain our good working relations and expand on it.

Senator CARPER. I like to say if it isn't perfect, make it better, and obviously everything we do, we can do better. Congratulations again.

The second question I have relates to the budget. For fiscal year 2008, the President's budget would provide the NRC with I think about $917 million. That is an increase of $95 million over the current fiscal year 2007. Could you just briefly describe for us the activities that this $95 million would fund?

Mr. KLEIN. In part what that does, Mr. Chairman, is that it continues, first of all, our existing focus on reactor safety for those existing fleets. But more importantly, it lets us start building and planning for the new combined operating licenses that we expect to receive. We have created a new Division of New Reactor Operations so that we do not get distracted from our fundamental mission of safety with the existing fleet.

So it will let us hire additional people. It will let us train those individuals. We have additional space needs. So it will let us become more efficient and we will continue to hire good people, train them, and be responsive to the American people.

Senator CARPER. All right. With respect to doing the actual licensing, I believe former Chairman Diaz had indicated earlier to us his belief that in light of the movement to a design-centered approach to new reactor licensing, that the timeframe for licensing reviews could be significantly improved. Historically, how long did it take the NRC to process a license application? Second, how long do you believe it will take for the NRC to process the combined license once you begin receiving them?

Mr. KLEIN. Mr. Chairman, as you know, in the past it has taken a very long time to license applicants, because we had a dual stage process of a construction permit and then an operating permit. What we have now done, as you know, is have a combined construction and operating license process. We additionally do design

certifications, so we are trying to get a standardized approach in with our system so we don't ask the same questions over and over again. So we definitely hope to improve the process.

Our current plan for the combined operating license is that it will take 30 months for the technical review, and then it will take 12 months for the hearing process.

Senator CARPER. Say that again?

Mr. KLEIN. It is 30 months for the technical review and then 12 months for the hearing process. So 42 months is a long time, particularly when you look at other countries building these plants in about 40 months. So it takes about as long to license them as it does to build them.

So I think after we get through the process, I hope we will have lessons learned implemented for the combined operating license, much like we did for the early site permit. The first few took about 33 months; the fourth one we expect to take 21 months. So we hope that when we go through the process, we will learn how to do it better and, as Commissioner Jaczko said, we absolutely have to have good quality applications. It takes a lot longer to review a poor one that it does to review a good one. So we would like to see good applications, and then I believe we need to be responsive and evaluate those in a timely manner.

Senator CARPER. Good.

Do any other Commissioners want to comment on this?

Mr. MCGAFFIGAN. Mr. Chairman, I have routinely followed the chairman in various speeches. I do want to give you a cautionary note. I do think that in license renewal, we achieved the sort of things, the 42 months probably for the first reviews, and then we improved. But the situation here is quite different. The design-centered approach will help. But many of the designs are not certified yet, or will be undergoing updates. So we are going to have multiple things going on simultaneously.

We are going to be working on far more applications from the get-go than we had in the case of license renewal. In license renewal, the rules relating to license renewal preceded me. They were passed in 1995 and early 1996. We are just issuing Part 52. The security rule is going to be issued later this year, the second of the three security rules, and the third one probably not until next year with regard to aircraft impact assessments.

Our staff was stable back then. It is highly unstable at the moment. We are losing a lot of our most senior and gifted staff.

We are going to do the best we can. We are going to absolutely do the best we can, but the analogy to license renewal and some of our previous successes is not perfect by any means.

Senator CARPER. All right. Thank you.

I think I am going to hold it right there for myself, and yield to Senator Voinovich. We start voting again at about 11 o'clock. I might want to suggest, Senator Voinovich, that once you have asked your questions, that you go vote, if you want, and then just come back and resume the hearing. That way, we won't have to stop at all. That would be my goal.

Senator VOINOVICH. OK. Thanks very much.

Human capital, you are saying that you are going to have another 200 hired this year. Have you ascertained if these applica-

tions come through, as we anticipate, what you are going to continue to have to do to hire people? That is No. 1.

No. 2, if you are in the business of hiring more people, the industry is going to be have to be hiring more people. As Mr. McGaffigan had to say, you are having folks retire. If you go around this country, you are going to find everywhere that business is worried about whether or not they are going to have the individuals they are going to need to continue to do the job that they are doing. So we have a real crisis here.

Do you believe that the private sector and academia is doing enough to recognize the fact that we have this problem? Is anybody really zeroing in on trying to make sure that you are going to have the people you need and the industry is going to have the people they need to get the job done?

Mr. KLEIN. Senator, I do not believe enough is being done for the human capital. We at the NRC have been successful in hiring individuals, but we really need to increase the pool of applicants from which we can draw. I participated in the roundtable discussion at Ohio State that included industry, higher education, and also the trade schools, in terms of what can we do to more actively pursue getting more young people interested in the nuclear fields.

I believe it is going to take a concerted effort by Government, by academia, and by industry to make this successful. If we all go after the same limited number of people and wave money in front of that same number of individuals, we all lose. We need to increase the applicant pool, and I don't believe that we have done it to the extent that we need to as a Nation.

Senator VOINOVICH. In a recent conversation with Commissioner McGaffigan, he pointed out to me that you have a lot of new hires. One of the concerns that I have is what is the NRC doing to institutionalize the lessons learned that we have learned in the last couple of years? Do you have a special program to try and bring them up to speed, because ordinarily it takes quite some time to really break somebody in? Are you aware of that? What are you doing about it?

Mr. KLEIN. We do have a program, Senator. It is very important to do knowledge management, to capture that knowledge. We do that in a couple of ways. For example, we have a qualification program. When we hire new employees, we go through a qualification program.

One of the aspects we have been fortunate in doing is with those that have retired and may not want to work 7 days a week like some of us do, but they will come back and work part-time. They have been heavily involved in our training program. So we are documenting both in written and in verbal activities the knowledge management.

Senator VOINOVICH. So you are taking advantage of the flexibilities that were given to you to take annuitants and bring them back on a part-time or full-time basis to try and train up the new people that are coming onboard?

Mr. KLEIN. Absolutely. We appreciate your help in letting us do that on the rehire of the annuitants. That has been very helpful.

Senator VOINOVICH. OK, physical facilities.

Mr. MERRIFIELD. Senator, can I just very briefly supplement what I think was your earlier question?

Senator VOINOVICH. Yes?

Mr. MERRIFIELD. I have had a chance to go out to about a dozen universities in the last couple of years. I think there has been a dramatic increase in the number of nuclear engineers in our Nation's universities and colleges. For me, I don't think is going to be as much of a problem as the issue that industry I think is going to face with having skilled electricians, skilled welders, skilled pipefitters who are qualified to do the work in a potential wave of new nuclear powerplants.

I think there is going to have to be a real commitment from our Government, from the industry, from labor unions and others to make sure that we work with our Nation's high schools, technical schools, and other training facilities to make sure that part of our technical workforce is available.

So I think it is a little bit more of a problem for the industry than it is for us as an agency.

Mr. MCGAFFIGAN. Senator Voinovich, if I might add, the 200, just as a clarification, is a net number. We are going to have to hire over 400 to get a net 200 increase. So we have 30 percent of our staff who have been with us less than 3 years. When we meet with you a year from now, it will be over 40 percent of our staff has been with us less than 4 years. It is a tremendous challenge.

Mr. MERRIFIELD. We met that challenge. We have been meeting that challenge. I think there is one important qualitative note to the issue as well. When we were doing hiring 5 or 6 years ago, the quality of the applicants that we were receiving is not as good as it is today. We have better applicants at the Agency, in part because we are such a good place to work, and in part because nuclear engineering is a much higher paid profession than it was 4 or 5 years ago, and that has helped, too.

Mr. MCGAFFIGAN. But I think the chairman's testimony points out, even in nuclear engineering, it is very important that the program that you and Senator Bingaman worked on last year gets continued; that the universities have a fixed sum of money to continue their programs; that it doesn't come out of the other DOE programs, such as the Global Nuclear Energy Partnership.

Senator VOINOVICH. What bothers me is that there is a $27 million program that was supposed to go out to the engineering schools, and at the Department of Energy they have taken that money now and put it into this GNEP.

Mr. MCGAFFIGAN. They haven't put it all in there. They have left some, and I think Congress again this year can, and I am speaking as one Commissioner, would urge that you have direct funding for the universities. We have not had a new research reactor in this country in decades.

I think Dale has the last one and I will let him talk.

Mr. KLEIN. The University of Texas at Austin's reactor is the last one that was built. It went critical in the early 1990's. But one of the reasons we did that is we had an old one in the middle of the campus and we moved it to our research campus.

In terms of the human capital, the undergraduate enrollment has gone up, but the graduate enrollment is pretty flat. We also

need to look at not the enrollment, but the degrees granted. We tend to look at things in the pipeline, rather than output. So the output has not really risen that much.

As you indicated, it is very important that the Department of Energy funds these university programs. Having lived in that arena for a number of years, it is very important that those programs receive funding because they have to compete for funding with other major programs, not only other engineering programs, but other components on campus. So it is very important that the Department of Energy continues its university programs.

Mr. JACZKO. Senator, if I could just add briefly, too. I think we often talk about the nuclear engineering programs, but it cuts across the whole spectrum of engineering. We rely on electrical engineers, mechanical engineers, civil engineers. Certainly, we have some grant programs on the nuclear engineering side, but those broader categories of engineering skills are certainly areas where there is a lack of enrollment of students in those programs.

Senator VOINOVICH. In conclusion, I would like to have kind of a half page on just what you are doing in terms of outreach to academia. I think I mentioned when you, Dale, were in the Partnership for Public Service. It is an organization that has a bunch of universities all over the country, a bunch, several hundred of them, that do a real job in trying to promote the opportunities that exist in the Federal Government. I would be interested to know whether or not you are on their list.

Mr. KLEIN. We can tell you what we are doing for the record, and then we will also tell you what we think would help the Nation.

[The information follows on page 64.]

Senator VOINOVICH. I am sure the chairman and I would be more than happy to sit down with some of the leaders in the area and underscore our concern about having the people that we need to get the job done.

Mr. MERRIFIELD. Senator Voinovich, I think we have been successful enough in broadening our outreach to universities. I believe we have been getting some refer requests for the lists of where we recruit because the utilities are trying to follow on our success trail.

Mr. MCGAFFIGAN. God help us.

Senator CARPER. All right. Mr. Voinovich, thanks.

Senator Clinton, I understand the vote has been moved to 11:10 a.m., so that leaves at least 7 minutes to have at it.

Senator Voinovich, if you feel like slipping over to the floor, they should start voting right about the time you get there. If you could come back and relieve me, then I will be able to go vote.

Senator Clinton, thank you.

Senator CLINTON. Thank you very much.

Mr. Chairman and members of the commission, it won't surprise you to hear that I have continuing significant concerns about Indian Point and about the adequacy of the oversight that the NRC is providing. That is why I have introduced legislation to require an independent safety assessment at Indian Point.

I simply don't have time in my round of questions to recite the full litany of recent problems at Indian Point, or to ask all of the

questions that I have for the NRC, so I will submit additional questions in writing.

But I do want to briefly describe some of the recent problems. Indian Point's rate of unplanned emergency shutdowns is now five to six times higher than the national average for all new nuclear plants in the United States. Indian Point Unit 3 has had three unplanned shutdowns just so far in 2007. Entergy recently failed to comply with an extended deadline of April 15 to have a new siren system installed in the communities around Indian Point pursuant to a requirement that I added to the 2005 energy bill.

In December 2006, the NRC gave Entergy 30 days to come up with a plan to resolve what the Agency called a chilling effect among workers who might be intimidated to not bring safety concerns forward. In August 2005, a leak was discovered in a spent fuel pool that seeped into the groundwater beneath the plant and reached the Hudson River. That leak continues today.

So you can see why I am concerned, because my constituents are concerned. Just about every week, we pick up the local newspaper and find some other problem at Indian Point.

First, I want to say thank you to the NRC for deciding to issue a fine of $130,000 for the failure of the sirens. But I remain concerned about Entergy's failure to meet a deadline that had already been extended 3 months. What is the cause of the delay? When do you expect the sirens to be fully operational? Why did you choose to assess a fine of $130,000, equivalent to the maximum daily penalty, when the violation has now exceeded 10 days?

With respect to the independent safety assessment, when I discussed this with the NRC last year, I was assured that the NRC would conduct extra inspections at Indian Point. My understanding is those are underway, but the reality is that problems continue at the plant, and there is a significant trust gap in what the NRC is doing in Westchester and around Indian Point.

If the NRC is so confident that its inspections are well run, why hasn't the NRC invited outside observers from State and local governments and NGO's to participate in these added inspections?

With respect to the chilling effect that you determined existed at Indian Point, I note that the commission relied on independent assessments to reach this conclusion. Why is relying on independent assessments appropriate in this case, but not in looking at other safety issues?

What is the estimated timeframe for stopping the current leaks from the spent fuel pool at Indian Point Unit 1? Are Entergy's decommissioning funds sufficient to cover the groundwater cleanup?

So these are some of the questions. I asked them all at one time because it may very well be that you want to answer them all at once time, instead of taking them piece-meal. But I hope that NRC is prepared to address these and other concerns from local government tomorrow during the annual safety review in Westchester County.

Mr. Chairman, I want to ask a request of you. I hope we could examine the issue of the adequacy of the reactor oversight process and the need for independent safety assessments in some detail, because I think that there are certain cases, and I believe Indian Point is one, where that additional safety check is necessary.

So Mr. Chairman and Commissioners, could you perhaps respond to my general concerns about Indian Point?

Mr. KLEIN. Senator Clinton, as we had visited prior to my confirmation hearing, it does seem like, as you indicated, Indian Point is snakebit sometimes. Certainly things like not getting the sirens working does not instill public confidence, so we are addressing those issues.

Let me talk more broadly and then turn it over to Commissioner McGaffigan for further comments. I would like to just talk a little bit about the independent safety assessment and compare it with our reactor oversight. One of the first tasks that I looked at when I became Chairman was the independent safety assessment and reactor oversight, and did a comparison.

I don't believe we are doing a good job at the Agency of explaining what our reactor oversight program is and what it does. It is a continuous evaluation process. Independent safety assessments tend to be a snapshot look. I think we need to do a better job as an agency of articulating what the NRC does. You and I have talked in the past. We want all of our reactors to be safe and examined, including Indian Point. So we try and we do have a program to ensure that reactors are safe. We have a rigorous inspection process.

I would like to let Commissioner McGaffigan talk a little bit more about the reactor oversight program and the independent safety assessment concepts.

Mr. MCGAFFIGAN. Thank you, Mr. Chairman.

First, I would like to tell Senator Clinton, I have been over 10½ years on the commission and we have given Indian Point very close attention. The people of New York should thank God every day that Entergy is running that site as an integrated site. ConEd and NYPA were not interested in running a safe nuclear site. They wanted to be out of the business. So I believe Entergy has been an enormous step forward for the Indian Point site.

Let me turn to the ISA. I also happen to be the sole Commissioner left to actually watch the first, the one and only ISA we ever conduced at Maine Yankee. Senator Sanders earlier today talked about how our ISA led to the closure. Our ISA was an ad hoc procedure that we invented in 1996 on a one-time basis. We had allegations that our Region I was too close to the licensee. We brought in people—independent—we had people from outside of that region and outside the Office of Nuclear Reactor Regulation come in. We had State involvement because we had an agreement with them. We have State involvement in inspections such as engineering inspections at Indian Point.

Our reactor oversight process developed in the late 1990's is infinitely better in my view than the ad hoc ISA that we conducted at Maine Yankee. It was not our conducting an ISA that led to the closure of Maine Yankee. It was a corporate structure, with 14 different owners, many of which wanted to get out of the nuclear business. They had plenty of decommissioning funds and so they said, we are out.

They brought Entergy in. They let them work for only a few months. Entergy would have been able to save that plant, and in some sense it is a sad story that corporate governance led to the

closure of Maine Yankee, because it could be providing a lot of very needed power in New England today.

We could talk to you about this at great length, why the reactor oversight program today, augmented as deem necessary at Indian Point, is so much better than the ISA conducted in 1996.

Senator CLINTON. If I could, Mr. McGaffigan, suggest that it might be worth considering having outside observers to try to rebuild some confidence in the work that you are doing. You all know, because you have been following this, it is just a terrible dilemma because there is the feeling that we keep being reassured that everything is fine, and then something goes wrong. It may be that the work that was done before was not up to standards, and there still are a lot of issues.

But why not let some outsiders in so at least there can be validation of the work that you describe as going on under the NRC supervision?

Mr. MCGAFFIGAN. I do think we invite the State to the engineering inspections that Chairman Diaz initiated (in fact, the whole concept of these extra engineering inspections was Chairman Diaz's). We had State involvement or invited it. I don't know whether it was taken advantage of when we had the first engineering inspections early this year.

So that is our protocol in other States. The State of Illinois is famous for its aggressive participation in our inspections. We don't move away from that at all. I think a lot of the people who want independent assessments really have a quite negative agenda vis-a-vis nuclear power. I think their vision of an independent safety assessment is one where folks who are really quite opposed to nuclear power come in and second guess fairly minor incidents.

Senator CLINTON. Could I ask Commissioner Jaczko to comment?

Mr. JACZKO. Well, I certainly think it is an interesting suggestion. I think it is one that I would support, of looking at ways that we could include an outside observer. I think your point about a trust gap is really very accurate. I think what we are dealing with at Indian Point to some extent is a trust gap.

There are situations and problems that you mentioned, but based on our assessment and oversight process, we think that those are lower on the level of safety significance. So they are not issues that we think are of tremendous safety significance. But I think we are having a challenge communicating that to the public around that plant.

I think adding something like outside observers to one of these design engineering inspections could perhaps go toward addressing that trust gap. But I believe we have done an inspection for Indian Point 2 as part of this design inspection. I believe Indian Point 3's inspection is coming up in the fall, so that would certainly be an area where I would support figuring out a way to include some outside observers. I think it would be good for the Agency to show the process that we use to go through this inspection.

Senator CLINTON. Commissioner Merrifield?

Mr. MERRIFIELD. Yes, Senator Clinton, I appreciate the suggestion. I think it is certainly one we could take a further look at. I don't think I am willing to commit at this point to having external folks come on board.

Frankly, as an agency that has tried to be very open, when we conduct the inspection, we have a series of public meetings after that where we open up our results. We have a dialog in public to explain what we do. Our staff goes into great detail about the processes we use, the facilities we inspected, and the results.

Yes, I think one of the things that we get somewhat defensive about, and I think it is somewhat understandable, is we were appointed as the independent regulator of nuclear power. I think some of our staff understandably take some umbrage when the issue of, well, gee, you are not independent enough, and there is a loss of trust.

In our view, I think that is one of the challenges that we deal with as an independent regulator. We have to call it as we see it. It is sort of like a soccer game, the officials, you are going to have certain people in the stadium that aren't going to like your calls and certain people who are, simply based on the score.

I agree with Commissioner McGaffigan. I think that there are some individuals, and certainly I don't mean to impugn your desire to seek the legislation, but I think there are some individuals who believe that were we to go down the route of an ISA at Indian Point that it would have the same result as Maine Yankee. I agree with Ed. I think it is a completely different factual situation relative to the issues that we were confronted with at Maine Yankee, which were quite serious. The issues, although you have noted them at Indian Point, are not nearly to the same safety significance.

We have to worry about having a degree of uniformity in the inspection programs that we do. I think that is ultimately one of the concerns I have, that the application of our processes at Indian Point should also be applicable to my home State plant of Seabrook, to Arkansas Nuclear 1, to Palo Verde in Arizona, and elsewhere.

To the extent we get ourselves to a point of cherry picking additional inspection resources based simply on some issues of public concern, I think that gets us into a very unpredictable standpoint as a regulator.

Senator CLINTON. Well, let me just end by saying that I understand what Commissioner McGaffigan said, that you do work with the State and the State could participate in some fashion. Is that correct?

Mr. MCGAFFIGAN. That is my understanding. I don't know whether the January inspection—perhaps Commissioner Jaczko knows—whether they took advantage of the opportunity or not.

Mr. JACZKO. It is my understanding that the State did have an observer for the inspection of Indian Point 2 that we did.

Senator CLINTON. OK. Thank you, Mr. Chairman.

Senator CARPER. Let me just follow up, if I can, with Senator Clinton. I may have mentioned this before you came, but we plan to hold a hearing later this year to discuss in some detail reactor safety and the reactor oversight process. I hope that you can join us at that time.

I would also just say I think the comment was made—was it Entergy that now operates the facility that Senator Clinton has raised concerns about? It is interesting. Right across the river from

where I live, in New Jersey, there are actually three nuclear reactors, nuclear powerplants: Salem and Hope Creek. During a period of time when they were overseen and supervised by PSEG, we had just a stream of problems and complaints and really legitimate concerns.

The folks from PSEG brought in Excelon to run that facility, and it was like night and day. This is day, and it is just a much better situation. Now, there is an effort for the two companies to actually merge and that fell apart and I understand that PSEG wisely has hired some of the Excelon team to continue the oversight at that plant.

So a lot of times, the quality of the people you have doing the job does matter. We have seen it with our own operation, with far fewer complaints, and just a far better feeling of safety, which is paramount.

I want to ask another question, and Senator Voinovich will come back. We have about 7 minutes to go on our vote. Senator Voinovich hopefully will come back so I can go vote.

I know the NRC is focused on finding ways—Senator Clinton, thanks again for joining us—to further expedite the licensing process. We talked a little bit about this, but I want to come back to it, if I may.

While I applaud your efforts and encourage you to be as efficient as possible, as we said before, you have to ensure that safety, fairness, and excellence remain your priority. Can you assure us that as you look to take steps to expedite the licensing process, that the process itself is not being cut short?

Mr. KLEIN. I can assure you, Mr. Chairman, that when we look at becoming more efficient, it is with no compromise on reactor safety. In all the activities that we look at in terms of becoming more efficient, taking lessons implemented, not just lessons learned, we always do that in mind with maintaining our oversight responsibility, and safety is No. 1.

Senator CARPER. All right.

Mr. MCGAFFIGAN. Mr. Chairman, I will echo that. We are going to take the time necessary to do these license reviews. Again, going to my earlier remarks about the contrasts with license renewal, in license renewal, we were independent. The rules were very fixed, and we weren't dependent on anybody else.

In new reactors, we are dependent on the Department of Homeland Security. We are dependent on the Department of Energy. We are dependent on numerous State agencies. We are also dependent on very high quality applications that deal with as many of these issues that involve other entities as possible.

I am sure that we are going to take the time necessary to do the job right and build on that. For the nuclear renaissance, it is more important that it is sustainable than that it gets off to a rapid start.

Mr. MERRIFIELD. Mr. Chairman, we have been looking at ways in which we can improve our process for combined operating license applications. All of those efforts that we have made internally to look at that, all start from the baseline that we maintain our safety factors. But while I think Commissioner McGaffigan has outlined very well many of the challenges that face us, I think

clearly—I agree with the chairman—I believe that there are improvements that we can make to make the process timely, efficient and effective and even more so, that maintains safety.

Clearly, given the mandate that we have a commission and the intent that we have made to lead our staff to do better, it certainly is, I believe, our obligation as a commission to continue to set goals for our staff for improvement in the way we conduct our processes, while maintaining full safety.

Senator CARPER. All right.

Mr. JACZKO. Senator, if I could just add a few points?

Senator CARPER. Mr. Jaczko?

Mr. JACZKO. I do think we have to be a little bit careful when we do talk about some of these issues, because we haven't actually used this licensing process yet, the actual licensing, what we call the combined operating license review. We have done components of it with the early site permits.

So we don't really yet know how long it will take. The staff has provided estimates about how long they think this process will take, but we really don't yet know. So I think we do have to be a little bit careful about trying to shorten he timeframe for a process that we don't really even know yet exactly how long it will take.

I think the thing that we have learned, certainly through some of the other elements of this, is that it really does depend crucially on the quality of the applications. As we have done design certifications and done early site permits, areas where there have been delays have often been the result of the applicant not providing sufficient information, which has caused us to go back and forth several times to get the information we need.

So a lot of this I think really focuses on getting the right information and making sure that we are only accepting applications that meet very, very high quality standards, because that will give us a predictable schedule, which I think is really the most important thing, more so than necessarily the time it takes, but having predictability.

Mr. MERRIFIELD. I would like to agree with particularly that last point. I think one of the things that we need to do is set clear expectations up front in our acceptance review of the application, in looking at the breadth and depth of that application, to give a licensee an expectation about what we think we can do in terms of that license review.

I think traditionally in the past, we basically said, gee, if we receive an application, then we will take X amount of time, without making any judgments relative to the quality of the application and how that affects our ability to conduct a timely review.

I think if we can do that, if we can communicate clearly and set a clear expectation up front that this is a high quality application and we believe it can be conducted in X months; or this is not as good an application, there are gaps to be filled; we believe it is going to be X plus some other number. I think that would certainly benefit the clarity, and certainly hopefully should benefit the expectation that Congress can expect from our Agency.

Senator CARPER. Good.

Mr. MCGAFFIGAN. Mr. Chairman.

Senator CARPER. Go ahead, just briefly, and then I am going to have to run and vote. We have about 3 minutes to go. I am not as fast as I used to be.

Mr. MCGAFFIGAN. Staff has laid out a program for each application for a Combined Operating License (COL) application that involves 2,000 to 3,000 different tasks that have to be carried out to get to the end point. Multiply it by 12 simultaneous applications before us. Multiply that by design certifications under simultaneous review. When I listen to the staff talk about their plans, it is a monstrous management job that lies before them.

Senator CARPER. All right. Thank you for each of your responses to those questions. That was reassuring. I think, as Mr. Jaczko said, going back and forth, back and forth, until he got the information he wanted and needed, he kept going back and forth.

Let me recess the subcommittee for a few minutes. Senator Voinovich will be back shortly. He will reconvene and ask his questions, and I will be back as quickly as I can.

For the next few minutes, the subcommittee stands in recess. Thank you.

[Recess.]

Senator VOINOVICH [presiding]. Thank you.

Senator Carper indicated I ought to just keep going.

Chairman Klein, could you bring me up to date on just where you are with your office space situation?

Mr. KLEIN. Senator, the office space has been a very challenging exercise. In February 2006, the Commission articulated its space needs to OMB and GSA to try to look at a permanent, long-term solution on space. It has been a very painful process of getting our space prospectus through the process.

We hear that it is about to be submitted to Congress, but it has been very painful because we had real needs that came out of the convenient cycle of the OMB process. I personally met with Clay Johnson at OMB to try to make sure that they understood what our needs were. He fully supported us being looked at out of cycle.

So we have been struggling to get through the bureaucracy of our space prospectus so it could be submitted to Congress. In the interim, what we have done is we had to move our training facility from our headquarters to Bethesda, about 30,000 square feet. We also had to go for another facility for rental space of about 60,000 square feet. So we are now located in three different locations.

One of my concerns is that the Kemeny Commission that analyzed the complicating factors of Three Mile Island indicated one of those factors was the fact that the NRC was in about seven different locations. So it is very important to the Commissioners that we are co-located so that our staff can communicate. So we would like to have facilities where it is within walking distance of the headquarters so that our people can communicate and that we can be an efficient body.

We understand that the prospectus that is about to be submitted may have some cost limitations that are not commensurate with what the real costs are, so we may need some relief from Congress.

Senator VOINOVICH. Where is that going to come to? You say it is a prospectus that comes over and you need legislation to authorize the expenditure of these funds?

Mr. KLEIN. What we needed to do initially is through OMB and GSA, we negotiate what our space needs are. They then submit their prospectus to Congress, and Congress agrees. But part of this prospectus, what we have heard, is that the costs that the GSA is assuming is much less than what the cost of rental space is in the vicinity of the NRC, so we may need some assistance.

Senator VOINOVICH. But does it take legislation? Or is it just a sign-off from a committee?

Mr. KLEIN. I think it may take some legislation.

Senator VOINOVICH. Well, I would like to get as much information as you can to see if we can't move it along. In Governmental Affairs and Homeland Security, we have jurisdiction over the General Services Administration, so maybe that would be helpful. So why don't you try and put me in the loop and put Senator Carper in the loop and see if we can't help get it done.

Mr. KLEIN. We will definitely do that. We appreciate your support.

[The information follows on page 64.]

Senator VOINOVICH. OK. Based on some of the classified hearings—and I wish that Senator Sanders was here—we held since 9/11, I am convinced that the nuclear powerplants are the most protected and secured facilities in the commercial sector. In fact, I have said to some of my friends that if I hear something bad is going to happen, Perry Nuclear is about 20 minutes from my house, so I am jumping in the car to see if they will let me in.

[Laughter.]

Senator VOINOVICH. I have visited other facilities in the State where they were bragging about how secure the facility was. I said that it doesn't hold a candle to what we have at our nuclear plants; why don't you go up and talk to them about what they have done to secure their places.

So to the extent that you can talk about it in an open setting, can you briefly summarize what the NRC has done to upgrade security across the board? Can you explain the layered approach to security at nuclear facilities? I would welcome any comments from any of the members of the commission in regard to what you have to say.

Mr. KLEIN. Thank you, Senator. I think your comments and assessments are very appropriate because if anyone has gone and visited a nuclear powerplant, they cannot help but come away and feel that these are robust, well protected, safe and secure facilities.

As you know, before I became chairman of the Nuclear Regulatory Commission, I was at the Department of Defense in the "noncontroversial" portfolio of nuclear, chemical, and biological defense programs. In that area, we looked at a lot of threats that we had to our Nation and protecting the men and women in uniform that do such a great job of protecting us.

So part of my responsibility was the physical security for other nuclear assets that the Department of Defense has. I was very impressed when I came over to the NRC to see both what the Agency has done in analyzing the possible scenario events of problems with their force-on-force exercises and with the increased attention physically that they have done for these plants.

Since 9/11, the industry has spent over $1 billion in increasing security at these facilities. So I would like to echo your comments. These plants are safe and secure.

In terms of the layered approach, there are certain aspects that we expect the utilities to perform, and then there are certain responsibilities that it is up to the Federal Government to do. Since 9/11, there has been a lot of emphasis on preventing hijackings. There are marshals that are on the planes. There are background checks. There are securities.

So there is a lot of responsibility for aircraft events that are responsibilities of the Federal Government, not the nuclear plant owners. But we do expect the operators to maintain their own security systems. It is robust, but it is multilayered. You have the plant itself, then you have the local responders, and then you have the Federal Government.

Senator VOINOVICH. The opening statement of Senator Sanders made reference to some things that I was not aware of. Do you want to comment on that? First, Ed, do you want to talk about that? Does anyone have any response to what he had to say about the GAO report and so forth?

Mr. KLEIN. I think Commissioner McGaffigan might want to comment on that.

Senator VOINOVICH. OK.

Mr. KLEIN. But let me say this initially. The reactor oversight program is effective. We watch it. The Commissioners watch it. The staff watches it. We expect all the plants to have a safe and secure program. Reactor oversight is robust. We always look for how we can make it better. We communicate our results of those investigations.

I think Commissioner McGaffigan might have some more comments to make.

Mr. MCGAFFIGAN. Well, let me first, on the security question you had just asked, I lived through it. Jeff Merrifield lived through the whole period. We are very proud that we acted in February 2002, less than 6 months after 9/11. We acted again in April 2003. We have been on top of the security issues from the start. We have 8,000 security officers at 64 sites. That is about 125 per site. These are all unclassified. I couldn't go into how many are at Perry. That would be classified. But an average at anytime day or night, 25 armed security officers are behind barriers that have been improved; with equipment that has been improved; training that has been improved thanks to an NRC order; and improved background checks. We are very proud of what we put in place.

Particular to Senator Sanders's comments, we were speaking with the staff while the subcommittee was adjourned. We believe, as I said in response to Senator Clinton, that the current reactor oversight process is an enormous improvement over what was conducted at Maine Yankee early in my tenure on the commission. Senator Sanders referenced the fact that after the independent safety assessment, Maine Yankee was closed. I believe that that was a matter of corporate governance, and not of the ability of that site to be recovered. Entergy was brought in and not given enough time to save the plant, and we did not yet have a good market for buying plants that were in distress. So it was closed.

The people making the decision, with 14 or 17 different owners involved, they had a very well funded decommissioning funds and they chose to walk away from the site. If you talk to the Entergy people that were involved at the time in trying to fix the problems, and there were significant problems, they feel that they could have recovered that site. They recovered equally bad sites in other parts of the country.

My notes are not complete as to what other issues he raised. I have Maine Yankee, and not enormous confidence in us. I think that that is true. I don't know how we, in parts of the country where people routinely attack our integrity, get public confidence. But it is true and we have to work at that. As a 31 year civil servant, I believe that the public should trust me and my staff at the NRC as the Nation's nuclear watchdog, but people with agendas have large voices in some of these communities.

Mr. MERRIFIELD. If I may jump in on that? I come from Southwestern New Hampshire, so we have a lot of interaction with our friends in Vermont. The house that we have up there is within 50 miles of Vermont Yankee, so the Vernon area of Vermont is quite familiar to me.

There are a number of people in that part of the State of Vermont who feel quite passionately that Vermont Yankee should be shut down. They feel quite passionately that Vermont should be a nuclear-free zone and that other alternative forms of energy would be appropriate. Some of those, not all, and I don't mean to say this in an accusatory way, but some of those believe that the use of a Maine Yankee-like ISA would result in the same result for Vermont Yankee.

We have no indicators, either from Vermont Yankee or for Indian Point, that there is anywhere near an analogous situation that would justify conducting that type of an invasive inspection. As Ed has mentioned, the salient elements of what we found at Maine Yankee have been brought into our current reactor oversight process. We learned. We learned through Davis-Besse. We learned through Maine Yankee. It has made us a better regulator.

I think it could be argued on the flip side of it, we as an agency, were there to be a process, were we to single out units because of a political displeasure with them, I think it could be argued that such an action would be arbitrary and capricious. In the absence of specific evidence that we don't have, that those plants are not operating safely, for us to go in and do an integrated safety assessment would be punitive and in my view unwarranted.

Mr. MCGAFFIGAN. Senator, I am finding my notes now. He raised a GAO report with regard to cesium 137 sources that were smuggled across the border. I want you to understand that the total amount that GAO smuggled across the border was on the order of 40 microcuries of cesium 137.

Senator VOINOVICH. I don't know what you are talking about. Maybe Senator Carper does.

Mr. MCGAFFIGAN. Well, it is a tiny, tiny amount, a factor of a million from an RDD, a factor of a million. I will leave out the units. We are our own worst enemy, and I think Commissioner Jaczko says this and I will agree, in communicating at times. Senator Sanders mentioned the thousand incidents of lost or aban-

doned sources over a 4-year period that GAO cited. Almost all of those are trivial, with factors of a million, sometimes factors of a billion from an RDD. But we have reporting requirements that require reporting of the trivial and those reports confused everyone. We have lost no significant radioactive source in the last 5 years, I believe; not lost and not recovered. The ones that we lost are used primarily in the oil and gas industry. They involve an isotope called iridium 192.

But we are strict. I think having old reporting requirements that highlight trivial source losses, and I don't know whether in this room we have tritium exit signs, but you have them all over these buildings. Those are not RDD devices. There is no potential. Breaking exit signs is not a problem.

So we don't communicate risk well enough and we need to do a better job of it.

Senator VOINOVICH. Thank you.

Senator CARPER [presiding]. Thanks, Senator Voinovich.

First of all, I understand you need to leave by 11:50. Is that right? OK.

I am going to ask a question of you, so that you will have a chance to answer this before you leave. I want to cover a couple of questions with respect to license renewals, if I may.

Commissioner Merrifield, how many nuclear powerplants have you visited in this country?

Mr. MERRIFIELD. All 104.

Senator CARPER. How many nuclear powerplants have you visited around the world?

Mr. MERRIFIELD. Two hundred and forty.

Senator CARPER. One of my questions is, who gets your frequent flyer miles?

[Laughter.]

Mr. MERRIFIELD. Thanks to a change made by Senator Warner some years ago, I, like other Federal employees, am able to keep those miles.

Senator CARPER. That is great.

Mr. MERRIFIELD. I think for the benefit of my wife who happens to be in the audience, I think I have earned them.

Senator CARPER. Would your wife raise her hand? OK, thanks. Thanks for sharing with us. I could barely see your lips move when he spoke.

[Laughter.]

Senator CARPER. A more serious question is, as you run around the world visiting all those hundreds of plants, and visit in countries like France where they rely a whole lot more on nuclear power than just about anybody else, what have you learned in looking at the way that they deal with their nuclear waste, spent fuels, that might be instructive to us as we look forward way down the road?

Mr. MERRIFIELD. The issue of reprocessing is a frustrating one. We invented that as part of the Manhattan Project. That was a technology we had that came from here. We used to reprocess fuel in the United States. The most recent civilian facility was in West Valley, NY, which closed in the 1970s due in part to a very signifi-

cant environmental containment issue associated with that site. So there are issues about appropriate management.

Our French counterparts, our English counterparts, our Russian counterparts, our Japanese counterparts all have the technology and capability to do reprocessing. In my personal view, we have the technology to do so in the United States and I think that that is something that the U.S. Congress should seriously consider whether it is appropriate or not to go back down that road.

Clearly, reprocessing reduces the amount of space that would be needed for a final repository. That having been said, it does come with a significant cost. It is not a cheap option. It is less costly to dispose of used fuel. There have been environmental challenges in the past, although I believe personally that others have demonstrated that those can be resolved.

So I think it is a matter which deserves serious reflection by Congress as to whether we ought to go down that road. I think it certainly would help to close the cycle.

Senator CARPER. All right. Thank you.

When you need to leave, feel free, OK?

Mr. MERRIFIELD. Thank you very much.

Senator CARPER. Back to the license renewals, if I could. I think I said this earlier, but the first nuclear plant operating licenses technically expired last year. Approximately 10 percent will expire by the end of 2010. I am told that more than 40 percent will expire by the end of 2015. Most, if not all, of these plants will be applying for license renewals that will allow those plants to continue to operate for another 20 years or so.

I have two questions. One is, how is the NRC geared up to handle the increased volume of license renewals expected in the next 10 years? The second related question is, could you please highlight for this subcommittee how the commission will assure that these reactors can be safely operated for the additional 20 years?

Mr. KLEIN. Mr. Chairman, as you indicated, this is an area in which the Nuclear Regulatory Commission has significant experience. We have done license renewals for 48. We have eight more currently under review. We expect 10 more coming in by the end of fiscal year 2008. As you indicated, we will probably receive license renewals for all of the plants that are operating.

We have a very rigorous process which we go through to ensure that these licenses are renewed, that they are able to be done safely. We watch the plants each year and continuously. We have resident inspectors to make sure that they are operated properly.

One of the issue that I think we need to look at as an agency, and start now, is what questions do we need to ask to see if they can be extended beyond 60 years. If you look at most of the nuclear plants and you talk about something that is 40 or 60 years old, about the only thing that is 40 and 60 years old is the license itself, because the pumps, the valves, the steam generators, a lot of the vessel heads have been replaced.

So just like a car that you may renovate and keep running, the nuclear utilities have found that they have massive investments and that if they maintain them, they can operate safely to provide the American public with the benefit that they need, and that is safe, reliable electricity.

So we need to start now, I believe, as a regulatory body to ask what do we need to look at for beyond 60 years.

Mr. MERRIFIELD. Mr. Chairman, I think we committed the commission, and the staff can correct me if I am wrong, to doing on average about 10 license renewals a year and funding it at that level of periodicity. I think that given all the other challenges before us, we have committed to making sure we have the resources in place to make that continue to be an efficient and effective process for conducting those.

The point I would add onto what the chairman has said is, a key part of the license renewal process is getting an understanding of the aging management program of the utility.

Senator CARPER. Can you say that again? Getting a handle on what?

Mr. MERRIFIELD. Getting a handle on their aging management process. Do they have a process in place to identify and resolve issues such as buried piping, aging cabling, things of that nature? That is an ongoing review. It is not as if we write them a blank check and they don't have to worry about it for another 20 years. We have an expectation that in an ongoing way, and subject to the validation of our inspectors, whether that plant is 40 years old and a day, or 50 years old and a day, it will have the same level and measure of inspection to make sure that it is operating in a safe manner.

Mr. MCGAFFIGAN. Mr. Chairman, just on the figures you cited at the outset, every plant that used to have a license that expires in the next few years is either already renewed or is in timely renewal for having requested license renewal. So there is no looming crisis that we are going to lose any plants, and we are in a very steady state, in fact, perhaps slightly declining volume of people that are coming in each year to be handled in license renewal. There would have been a crisis if we hadn't handled it well a decade ago or so, but there is no crisis today in terms of plants that might have to go offline.

I also agree with the chairman that we can go beyond 60 years. Commissioner Merrifield has said that as well. We have a so-called pressurized thermal shock rule that we think can be significant.

Senator CARPER. You have a what?

Mr. MCGAFFIGAN. It is the integrity of the reactor pressure vessel. How long is the pressure vessel, the most important component viable?

Mr. MERRIFIELD. How long can it last given the pressures and temperatures it is subject to as far as operations go.

Mr. MCGAFFIGAN. That rule we believe we will update in the next few years, and we will empower in doing so the potential for license renewal well beyond 60 years, if the plant is properly operated.

Senator CARPER. All right. Thank you.

Senator Voinovich.

Senator VOINOVICH. First of all, I think we ought to recognize the leadership of Nils Diaz of the NRC. I know we are congratulating you on the fact that it is the best place to work, but I think that some of the things that he put in place while he was chairman contributed to that. Nils, if you are reading the testimony, thank you

very much for the leadership that you provided to the Nuclear Regulatory Commission.

One of the things that I discussed with him at length is the issue of communications and public relations. I just wonder what steps have been taken by the commission to reach out to people that are really interested in this area, particularly on the local level. You were just referring to, was it the Yankee Vermont. Has anybody ever sat down with the editorial writers, the editors, to talk to them, to inform them about what the facts are, at least from your perspective?

We have it all over the country, where it seems to me because of the public's interest in this, continuing interest, that the commission should have something in place where they are reaching out to bring people up to date on where you are and what you have done, so you are the ones that are coming forward with it, rather than reacting to some story that is written that may be based on information that is not reliable.

Mr. MERRIFIELD. I will take a stab at that one. I think we have really changed a lot as an agency in the 9 years that I mentioned. I think we used to take very much sort of a Maytag repairman approach to our mission. We appear when called upon. I think our view has changed more recently, and in fact it resulted in some recommendations.

Senator VOINOVICH. By the way, I wish Maytag was still in business.

[Laughter.]

Mr. MERRIFIELD. Me, too. But as a result of some changes recommended in a task force I led, I think the Agency has done more to be proactive in the approach it takes to the public and the people we serve. We have improved our Website. We have improved its quality and scope and we have made a more plain-English version of many of the documents that we use to make them more approachable to average members of the public.

When we have our regularized inspections at the site, we have public meetings where we open that up. We provide notices to let people come in and ask us questions about what have found, and ask questions about issues that they may have. We have been trying to conduct outreach to Members of Congress who have facilities in the localities of nuclear powerplants. We have done I think a better job in that regard.

I think we have also, as you mentioned, tried to get out to a variety of newspapers, editorial boards, Rotaries and other entities to explain what we do as a regulator and why it is important.

I think probably one of the problems that we confront, which was postulated by my first comment, is ongoing regulatory assessments of safety, it is not a very sexy issue for newspapers or the print media. In the absence of some major issue, the likelihood that we are going to get coverage is pretty small.

But nonetheless, we have been making an aggressive effort to try to get out there. Obviously, we can do more and we should.

Senator VOINOVICH. I would like to know if you have a plan in place that you are following, and it is not just hit and miss.

Mr. KLEIN. Senator, we do have an active outreach program. I really agree with your comments and your assessment. We need to

be more proactive on education. I would like to see the NRC, and I think my fellow Commissioners agree, that we would like to be the source of information. So if someone has a question about nuclear energy, they come to see us. They go to our Websites. We have information that is readable and very usable for what their needs are.

I don't think we are there yet, but we are getting there. As Commissioner Merrifield said, we have modified our Websites. We have a public affairs person that tries to communicate and respond. So we try to be responsive to people's inquiries, but we need to do more, because I think we can educate the public in a better way than we have been.

Mr. MCGAFFIGAN. Senator Voinovich, I would just point out that we do have annual assessment meetings at every reactor site that get attended in some places very heavily and in other places not as much. We have resident inspectors at every site. We are reluctant to give them too much exposure to the media because their job is to watch the reactors. But I have always felt that a tremendously unused asset is to allow our residents and senior residents to be interviewed by the local media. We have tried.

The last point I will make to you is that you complimented Chairman Diaz for fixing all the problems at the NRC. It was started under Shirley Jackson and was continued under Dick Meserve and continued again under Nils Diaz. All of them deserve credit for helping to identify problems and fix problems.

Mr. MERRIFIELD. Mr. Chairman, having served under all of those chairmen, as well as Greta Dicus, who was chairman for a very short period, I agree with Ed on that. I think there is a lot of credit that goes for the progress that we have made as an agency.

The only other comment I would make on meetings, I muse about a license renewal proceeding that we had probably 6 or 7 years ago. It was associated with Arkansas Nuclear 1 down in Arkansas. We sent our resident inspectors and the professionals we had at the site to go out into the local community and put up signs and try to generate support for the license renewal meeting that we were conducting. So they did that, and three people showed up at that public meeting. Two of them were Boy Scouts who were getting their Eagle badges, and the third was their father who was accompanying them.

So we have endeavored sometimes, but the response has not always been what we would hope.

Senator VOINOVICH. Thank you.

Senator CARPER. All right. We are going to wrap it up here. I enjoyed this. It has been informative.

First, let me just say to Commissioner Merrifield as you prepare to pull up anchor, you and your bride, and start using some of those frequent flyer miles. As we used to say in the Navy on occasions like this, "Fair winds in a fallowing sea." So I would certainly want to say that to you.

For the rest of you, you have to report back for duty. When we convene this hearing again, we look forward to having a closed session so that we can get into some more sensitive matters at that time.

Mr. MERRIFIELD. Senator, although this may be my last public hearing, I would certainly want to leave it on the record that as this was my home where I came from, having been a Senate Environment Committee staffer, I am always happy to come back either in private meetings or in a public setting even after my departure from the commission.

Senator CARPER. You may regret making that offer.

[Laughter.]

Mr. MERRIFIELD. It is part of public service, Senator.

Senator CARPER. We hope not.

Senator Voinovich, I don't know if you ever took driver's ed when you were a kid in high school. I know I did. I remember the first time we went out to drive, and I was in the driver's seat, we had dual controls in the cars then. It had a steering wheel and a set of brakes and the gas pedal for the instructor who was sitting in the right front seat. I was trying to figure out on my first time out how to use a stick shift, how to go back and forth between the brake and the accelerator.

I remember we were coming back from my spin out in the countryside, and we were coming back to my high school, and turning in to the drive to back to my high school, and it was a gravel road. I was just thinking about what a great job I have been doing on that stick shift, and instead of putting on the brake as I turned into the drive, I stepped on the accelerator. Fortunately at the same time my instructor sitting right beside me stepped on the brake.

I think there is a lesson that I still remember from all those years ago. There are a lot of folks who are encouraging you to step on the accelerator. There is a lot of work to do, and there is a need for us to move expeditiously in reviewing these applications for renewals and new projects.

It is also important that somebody keep their foot on the brake and that we use both in an appropriate way.

I have said this before and I will say it again: You all are doing a good job, particularly with providing a good workplace. Senator Voinovich's comments about your predecessors as chairmen are well timed. But everything we do, everything I do, I can do better. As good as you obviously feel about the work that has been done in the last 9 years that Commissioner Merrifield was talking about, you know that there is still room for improvement. We urge you to find that room and make it happen.

I have a question. I am going to save the question and ask you to respond on the record. The question is: Is this Yucca Mountain repository designed to house 70,000 metric tons of nuclear waste? By the year 2035, the United States is projected to have produced 105,000 metric tons of nuclear waste. Since the Nuclear Waste Policy Act requires the Government to assume responsibility for permanently disposing of the Nation's nuclear waste, how does this impact the NRC's licensing of future nuclear power generation?

If you would provide responses for us on the record on that, I would be grateful.

Again, we thank each of you, Mr. Chairman, and to each of our Commissioners. We thank you for not just appearing today. We thank you for responding to our questions and for your testimony,

and for being frank and forthright with us. We have explored some important issues. We are going to continue in this session of Congress to do that, both in public sessions like this and on occasions when it is appropriate, in closed sessions.

It is a real honor for me to sit here next to Senator Voinovich, and to continue to provide some leadership for this subcommittee. They have their work cut out for them and clearly we do as well.

With that having been said, this hearing is adjourned.

[Whereupon, at 12 o'clock p.m., the subcommittee was adjourned, to reconvene at the call of the chair.]

[Additional statement submitted for the record follows.]

STATEMENT OF PETER B. LYONS, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Chairman Carper, Ranking Member Voinovich, and members of the subcommittee, I thank you for the opportunity to provide this statement before your subcommittee on Clean Air and Nuclear Safety. I truly regret that my duties prevent me from speaking to you personally today.

In the two years of my tenure at the Nuclear Regulatory Commission (NRC), the challenges confronted by the Commission have demanded great devotion to the standards of independence, public openness, and sound technical bases, standards I am proud to say have been met. During my tenure I have gained immense respect for my fellow Commissioners and for the agency's highly competent and professional staff. As a Nation and as an agency, we face even greater future challenges and the need for continuing commitment and dedication. Therefore, I once again reaffirm my personal commitment to public service in a manner that continues to meet these high standards.

I gratefully acknowledge the support of this subcommittee and of Congress in providing the resources necessary for the NRC to carry forward its mission and meet the challenges of the future. As the NRC purposefully and thoughtfully prepares for what is likely to be an unprecedented wave of new power reactor applications, we are also very mindful of our mission to ensure the safety of today's operating reactors. If we hope to contribute to a new generation of power reactors that safely and securely help meet our Nation's future energy needs and increase our energy independence, we recognize that this opportunity rests on the continued safe operation of today's reactors. Our reactor inspection and oversight program serves as a model of continuous improvement. In the hands of our resident inspectors at each site and teams of specialist inspectors in our regional offices, it remains our strongest oversight tool.

Reactor-site security has been enhanced through NRC orders and regulations since September 2001 and by the NRC-graded testing of security forces. Our nuclear power critical infrastructure is among the best protected of all critical infrastructures in our country and provides a benchmark to which other industries can strive. The Commission has given and continues to give thoughtful and careful consideration to the security-related requirements that are necessary to ensure adequate protection of public health and safety. This consideration entails close and constant collaboration with our Federal, State, and local partners in assessing the threat environment and maintaining an effective response capability. I have been pleased with our progress but continue to monitor it closely. Plant designs that could be built in the future already have improved safety features that will also make them more resistant to threats such as aircraft crashes. These designs will, in addition, meet the requirements for all power reactors to have mitigation capabilities to cope with such events.

The NRC's ability to meet its future human capital needs will continue to be a priority because we are in competition with the utilities, designers and vendors, manufacturers, other agencies, national laboratories and universities, and even with other countries that are outdistancing us in their advancement of nuclear technologies. The Nation must continue to focus on its academic infrastructure to attract the bright and motivated young people we will need in the future. The U.S. was the originator of nuclear technology, but we have lost the lead. The research and test reactors and associated instrumentation and controls that are used to train new generations of engineers have not appreciably changed since they were first designed in the 1950s and 1960s. Ensuring continued federal funding through the Department of Energy is necessary to enable the U.S. to catch up and once again become a leader in this arena. Our future health as a Nation depends on it. In a simi-

lar vein, the Commission is evaluating the use of digital instrumentation, controls, and safety systems into nuclear power plants. Along with essential safety benefits, this technology brings regulatory, experience, and expertise challenges. To help address this issue, the Commission has directed the staff to conduct a public workshop to explore approaches for establishing an integrated digital instrumentation and control and human-machine interface test facility in the U.S.

We are fortunate to have had a long history of NRC managers and executives who have fostered a working environment that has garnered award-winning recognition as one of the best Federal employers. Our rapid expansion has stressed our ability to find adequate work spaces for our new employees, and I respectfully ask this Subcommittee for its continued support as we seek the best ways to accomplish our expansion while maintaining our reputation as a Federal employer of choice.

In closing, I thank the Subcommittee for this opportunity to address these important topics, and I look forward to a continuing dialog with you.

NRC'S INITIATIVES INVOLVING INSTITUTIONS OF HIGHER EDUCATION

In FY 2006, the NRC reached out to academia to stimulate interest in fields of study related to nuclear power by implementing the Nuclear Education Grant program. NRC provides grants to support courses, studies, training, curricula, and disciplines pertaining to fields that are important to the work of the agency. The NRC has made available ~$4.7M to institutions and anticipates that 20 grants will be awarded in FY 2007.

The Scholarship and Fellowship Program supports students pursuing an education in critical skill areas related to the NRC's regulatory mission. In return, students must fulfill a two to four year term of employment with the NRC, depending on the degree level of the program.

Through the Minority Serving Institutions Program (MSIP), the NRC establishes and participates in partnership programs with institutions of higher education, including Historically Black Colleges and Universities (HBCUs), Hispanic Serving Institutions (HSIs) and Tribal Colleges and Universities (TCUs), to enhance their capacity to train students in fields that are critical to the agency's mission. Programs and activities include, but are not limited to: mentoring, leadership, research and development opportunities, program evaluation, training and technical assistance, recruitment and retention initiatives, student tuition assistance, scholarships, and housing.

The agency has been working to establish solid relationships with colleges and universities. Agency staff present seminars to students, faculty, placement officials, and on-campus society chapters to inform students and faculty of the agency's mission and how various disciplines are applied at the NRC. In addition, the Chairman and Commissioners have visited college campuses on a number of occasions to speak before audiences on the importance of nuclear engineering and other technical programs. Chairman Klein has recently made presentations at the Ohio State University and Massachusetts Institute of Technology.

In FY 2006, the agency established the University Champions (UC) program. The UC's serve as emissaries of the NRC and establish a close individual liaison with the school officials. They participate in meetings with engineering and science department heads, professors, and career counselors, as well as conduct NRC information sessions with students. UC's work closely with the NRC recruitment team to assure highly qualified students have an opportunity to be considered for employment at the NRC.

As part of ongoing recruitment efforts, NRC participates in numerous events sponsored by colleges, universities and professional organizations. These efforts not only support the immediate hiring of NRC's full-time workforce, but provide outreach for programs such as cooperative education, internships, and summer employment which support the agency's long-term skill needs.

NRC offers funding opportunities for research, including an upcoming request for proposals to perform research to support the development of high temperature gas cooled reactor tools and data. Universities are also eligible for cooperative research agreements with the Agency.

NRC OFFICE SPACE NEEDS

May 1, 2007: NRC staff held a conference call with Senate Committee on Environment and Public Works, Subcommittee on Clean Air and Nuclear Safety Majority and Minority staff regarding the NRC's office space needs and the current prospectus.

May 3, 2007: NRC staff held a conference call with the House Transportation and Infrastructure Committee, Subcommittee on Economic Development, Public Buildings, and Emergency Management Minority staff director regarding the NRC's office space needs and the challenges in the prospectus currently before the Subcommittee for consideration.

May 7–15, 2007: NRC Congressional Affairs staff met with 12 personal offices, including Senator Cardin's staff and staff to members of the House Transportation and Infrastructure Committee, Subcommittee on Economic Development, Public Buildings, and Emergency Management, to apprise them of NRC's office space needs and the challenges in the current prospectus.

May 30, 2007: NRC staff met with Senate Committee on Environment and Public Works, Subcommittee on Transportation and Infrastructure Majority and Minority staff regarding the NRC's office space prospectus. The following one-page overview of NRC's office space needs at its headquarters and challenges in the current prospectus was provided to Subcommittee staff.

Week of June 4, 2007: NRC Congressional Affairs staff will meet with the House Transportation and Infrastructure Committee, Subcommittee on Economic Development, Public Buildings, and Emergency Management Majority staff director.

OVERVIEW OF NRC OFFICE SPACE NEEDS

PROBLEM

The NRC needs additional office space for its headquarters to accommodate its staff growth. Given the agency's anticipated increased workload and expected retirements, the U.S. Nuclear Regulatory Commission (NRC) must hire 400 new staff each year for the next 5 years.

The proposed rent cap in the GSA prospectus for additional office space for NRC headquarters does not reflect the market level for North Bethesda, the Agency's current headquarters location.

BACKGROUND

NRC consolidation is key. Independent studies have concluded that consolidation of NRC's headquarters is essential to NRC's operational efficiency, regulatory effectiveness, and incident response capability.

The GSA prospectus includes a rate cap of $32/square foot and a delineated area of "suburban Maryland." However, GSA has advised NRC that expansion the search radius to 3 miles is not likely to yield options within the proposed $32/square foot rate cap; GSA advised that $41/square foot is more realistic for the current headquarters location.

COSTS

The NRC is seeking relief from the $32/square foot rent cap ($3,840,000 annual rent maximum) by raising the rent cap to $41/square foot ($4,920,000 annual rent maximum). This is a proposed annual rent maximum increase of $1,080,000.

Rent costs (fully serviced) for current Headquarters facilities:

One White Flint North: $36.67/s.f.

Two White Flint North: $40.29/s.f.

Bethesda-Gateway: $37.37/s.f.

Executive Blvd: $37.42/s.f.

NRC is a fee-based agency. Ninety percent of costs are borne by industry. Industry supports maintaining NRC consolidation, given the resulting efficiencies.

If NRC's headquarters were to deconsolidate and seek additional office space 3 miles or more away from its current location, the annual recurring costs plus rent at the GSA proposed rent cap of $32/square foot would result in an annual cost increase of $1,638,000 for the space. Therefore, maintaining the NRC headquarters consolidation at or near its current location in North Bethesda will result in a lower cost profile over time, even at the requested increased rent cap of $41/square foot.

ACTION NEEDED

Amend prospectus maximum proposed rental rate to $41.00 per square foot.

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