S. HRG. 109–1074

OVERSIGHT ON NRC'S REGULATORY RESPONSIBILITIES AND CAPABILITIES FOR LONG- AND SHORT-TERM SPENT FUEL STORAGE PROGRAMS

HEARING

BEFORE THE

SUBCOMMITTEE ON CLEAN AIR, CLIMATE CHANGE, AND NUCLEAR SAFETY

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

ONE HUNDRED NINTH CONGRESS

SECOND SESSION

SEPTEMBER 14, 2006

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SECOND SESSION

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C O N T E N T S

OVERSIGHT ON NRC'S REGULATORY RESPONSIBILITIES AND CAPABILITIES FOR LONG- AND SHORT-TERM SPENT FUEL STORAGE PROGRAMS

THURSDAY, SEPTEMBER 14, 2006

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

The subcommittee met, pursuant to notice, at 9:35 a.m. in room 406, Dirksen Senate Office Building, Hon. George V. Voinovich (chairman of the subcommittee) presiding.

Present: Senators Voinovich, Inhofe, Carper, and Jeffords.

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

Senator VOINOVICH. The meeting will come to order. This hearing is on the Nuclear Regulatory Commission's regulatory responsibilities and capabilities for long- and short-term spent fuel storage programs. We believe that strong oversight is critical in this area.

At previous oversight hearings, we have focused specifically on the NRC's new reactor licensing process to steer the Agency towards making its process more efficient and timely. The NRC is faced with a huge challenge in having to process a tidal wave of new reactor license applications that are expected within the next 2 to 3 years in the magnitude that has not been seen in the last 25 years or so.

For this reason, we have made strong oversight of the NRC a top priority for this subcommittee. We need to make sure that the Commission is taking a balanced approach as a regulator that ensures the safe operation of the existing fleet of nuclear plants without stifling the growth of nuclear power.

A long-term commitment to nuclear energy will make the United States more energy independent and energy efficient. This Congress and the President demonstrated strong leadership by enacting the Energy Policy Act of 2005, which encourages diversity of energy sources, including emission-free sources of electricity such as nuclear energy.

In order to fully realize the benefits that nuclear power offers, however, a solution for the problem of disposal of spent nuclear fuel must be found. Since the enactment of the Nuclear Waste Policy Act of 1982, which requires that a final disposal facility be oper-

ational by 1998—did you hear that? By 1998. Ratepayers across America have paid over $27 billion to the nuclear waste fund and continue to pay an additional $750 million each year. Yet, here we are, 2006, and the Energy Department has yet to submit a license application to the NRC.

While I am encouraged by the Administration's bill introduced by request by Senators Inhofe and Domenici to provide needed Yucca Mountain reforms, I believe it is even more critical that the Federal Government commit itself to the implementation of the existing law. In the meanwhile, the Administration earlier this year called out the global nuclear energy partnership for the long-term reduction of waste through reprocessing. It is referred to as GNEP.

At the same time, the fiscal year 2007 energy and water appropriations bill includes a provision requiring establishment of interim waste storage sites around the country. These provisions require a lot from the NRC in a short period of time. This committee has worked very hard to give the NRC the resources and reforms needed so that it can efficiently review new reactor applications.

But now, I'm afraid that these waste proposals have the potential to move us backwards and could end the nuclear renaissance before it even begins. Also, I believe that pursuing GNEP and interim storage could take the focus away from Yucca Mountain, delaying or ending that important project.

I question whether DOE can select and submit license applications for 30 or so interim storage facilities within 300 days of enactment of this legislation, as proposed. I also question NRC's capability to review these applications in 32 months. Therefore, I would like to focus the subcommittee's attention today on evaluating these different nuclear waste provisions and how they will impact the NRC in terms of its resources and its capability to carry out other vital programs such as the new reactor licensing program and the operating reactor inspection and oversight program.

Finally, I look forward to hearing from our distinguished witnesses on this policy today.

[The prepared statement of Mr. Voinovich follows:]

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

The hearing will come to order. Good morning and thank you all for coming.

I am pleased to have such a diverse group of witnesses here today to share with us their perspective on the Nuclear Regulatory Commission's (NRC) regulatory responsibilities and capabilities for complying with long- and short-term spent fuel storage programs as well as to get their opinions about our country's nuclear waste options.

Today's hearing continues this committee's strong oversight of the NRC, as I believe that strong oversight of the NRC is critical to the welfare of the American public. It is the third NRC oversight hearing this year, the seventh that I have chaired, and the tenth in a series that began in 1998 when Senator Inhofe was chairman of this subcommittee.

The previous oversight hearing held in June focused specifically on the NRC's new reactor licensing process to steer the Agency towards making its process more efficient and timely. NRC is faced with a huge challenge of having to process a tidal wave of new reactor license applications that are expected within the next 2 to 3 years, in the magnitude that it has not seen in the last 25 years or so. For this reason, I have made strong oversight of the NRC a top priority for this subcommittee. We need to make sure that the Commission is taking a balanced approach as a regulator that ensures the safe operation of the existing fleet of nuclear plants without stifling the growth of nuclear power.

A long-term commitment to nuclear energy will make the United States more energy independent and energy efficient. This Congress and the President demonstrated strong leadership by enacting the Energy Policy Act of 2005, which encourages diversity of energy sources, including emission-free sources of electricity, such as nuclear energy. In order to fully realize the benefits that nuclear power offers, however, a solution for the problem of disposal of spent nuclear fuel must be found. Since the enactment of the Nuclear Waste Policy Act of 1982, which requires that a final disposal facility be operational by 1998, rate payers across America have paid over $27 billion into the Nuclear Waste Fund, and continue to pay an additional $750 million each year.

Yet, here we are in year 2006, the Energy Department has yet to submit a license application to the NRC. While I am encouraged by the Administration's bill introduced by request by Senators Inhofe and Domenici to provided needed Yucca Mountain reforms, I believe it is even more critical that the Federal Government commit itself to the implementation of existing law.

In the meanwhile, the Administration, earlier this year, rolled out the Global Nuclear Energy Partnership (GNEP) for the long-term reduction of waste through reprocessing. At the same time, the FY 2007 Energy and Water Appropriations bill includes a provision requiring establishment of interim waste storage sites across the country.

These provisions require a lot from NRC in a short period of time. This committee has worked very hard to give NRC the resources and reforms needed so that it can efficiently review new reactor applications. But now, I am afraid that these waste proposals have the potential to move us backwards and could end the nuclear renaissance before it begins. Also, I believe that pursuing GNEP and interim storage could take the focus away from Yucca Mountain, delaying or ending that important project. I question whether DOE can select and submit license applications for 30 or so interim storage facilities within 300 days of enactment of the legislation as proposed. Also, I question NRC's capability to review these applications in 32 months.

Therefore, I would like to focus this subcommittee's attention today on evaluating how these different nuclear waste provisions will impact the NRC in terms of its resources, and its capability to carry out other vital programs, such as the new reactor licensing program and the operating reactor inspection and oversight program.

Finally, I look forward to hearing from our distinguished witnesses on this critical policy issue.

Senator VOINOVICH. I would now like to call Senator Carper as my Ranking Member. Senator Jeffords, you can go ahead.

OPENING STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

Senator JEFFORDS. Mr. Chairman, today we are conducting a very important hearing. We are trying to get a better sense on whether the Nuclear Regulatory Commission will be able to adapt to proposed changes in our nuclear waste storage policies.

This hearing follows our March oversight hearing on the Yucca Mountain project. My State of Vermont, along with 39 other States, relies on nuclear power for a large portion of its electricity generation. It is an important part of our energy mix. Nonetheless, we must be realistic in dealing with the downsides associated with nuclear power. One of those downsides is finding a way to manage the waste. Throughout my time in Congress, I have continued to work for a comprehensive solution to our nuclear waste problem. Back in 1977, I introduced a bill in the House calling for a comprehensive nuclear waste disposal strategy. I maintained then, as I do now, that finding an effective solution to the waste problem is critical to the future of nuclear power in this country.

I have consistently supported the central storage solution for nuclear waste. I continue to believe that it is essential we find permanent geological storage site if we are to continue to produce nuclear power. However, I have also made clear my views that Yucca

Mountain will not provide this solution and the project faces many challenges. I have been very concerned that the Yucca site would only take part of the waste, leaving some, if not most, of the spent nuclear fuel sitting on the banks of rivers, beside our small communities and our large population centers. While I support the notion of a central storage site, others have proposed new strategies, including reprocessing waste, interim storage sites, and additional on-site storage. Each of these approaches raises serious challenges and concerns.

Both the Governor of Vermont and the Attorney General of my State have contacted me in opposition to recent proposals for new interim storage.

In the context of Yucca Mountain, I have strongly opposed legislation that would limit the public process, influence scientific studies, or rework regulations to fit our efforts to build the project. I have the same view for all legislation that would manage nuclear waste.

If Congress cuts corners, we will undermine our efforts to develop a sound, permanent, and comprehensive solution to the problem of nuclear waste disposal. We will be telling our constituents that the important issues have been addressed, when they have only been swept under the rug. Americans need to know that high-level waste will be stored safely, that we set the highest and best standards to protect the environment an human health when we build future storage disposal sites.

We must demand answers about whether change in our nuclear storage policy is a wise decision, and are we burdening our regulators. Do we have the resources, both in dollars and personnel, to handle this task? And we will arrive at a better solution to the challenges of disposing our Nation's nuclear waste.

I look forward to hearing from today's witnesses, Mr. Chairman.

[The prepared statement of Senator Jeffords follows:]

STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

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I have consistently supported a central storage solution for nuclear waste. I continue to believe that it is essential that we find a permanent, geologic storage site if we are to continue to produce nuclear power.

However, I have also made clear my view that Yucca Mountain will not provide this solution, and the project faces many challenges. I have been very concerned that the Yucca site will only take part of the waste, leaving some, if not most of the spent nuclear fuel sitting along the banks of rivers, beside our small communities and our large population centers.

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Are we burdening our regulators? Do we have the resources, both in dollars and personnel, to handle the task? And will we arrive at a better solution to the challenges of disposing our nation's nuclear waste?

I look forward to hearing from the witnesses.

Senator VOINOVICH. Thank you, Senator Jeffords.

I would now like to call on Senator Inhofe.

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

Senator INHOFE. Thank you, Mr. Chairman.

First of all, I've shortened my opening remarks because many of the things you have said are things I was going to say.

I think, finally, after all the efforts we have made, that over the past year we've really accomplished a lot in promoting the nuclear renaissance. It was only 7 months ago that the chairman at that time, Mr. Diaz, had informed us that he was expecting 11 combined construction and operating lines, COLs, license applications by 2009. However, today I am happy to hear the NRC now anticipates 19. That shows we are moving in the right direction.

I specifically credit this renewed nuclear renaissance to key critical nuclear provisions that we in this committee crafted, such as NRC reform, security, liability insurance, human capital provisions, combined with other nuclear key provisions such as risk insurance, production tax credits, and loan guarantees. We have been doing all these in anticipation of this surge, not really knowing that this surge would come at this capacity. I'm very pleased.

Though I am pleased with the ongoing efforts by both NRC and DOE in implementing these critical nuclear provisions, I remain extremely concerned about the NRC's capacity, its ability to address the increased amount of workload required to review the increased number of COLs, while simultaneously preparing for Yucca Mountain license applications due from the DOE in 2008.

Mr. Chairman, I know that you have been instrumental in assisting the NRC to address and space needs, and I thank you for that.

I was going to talk about the interim thing. This is one of the rare times that Senator Jeffords and I agree. I don't think we should have the 37 interim sites, either. We just don't have the capacity. But the committee may be forced to use its resources, energies on that proposal.

The committee is also concerned about the time line associated with the Global Nuclear Energy Partnership, GNEP. For instance, my understanding is that the funding for nuclear programs at universities we eliminated to support GNEP. In addition, some of the

DOE's funding for the nuclear power 2010 program, which is critical to the combined construction and operating license application process for new nuclear plants, was reduced to further support GNEP. Also, for the successful implementation of GNEP our NRC will be required to license fuel reprocessing plants, as well as fast reactors. This will further strain NRC's limited resources.

As you know from our committee's earlier hearings on Yucca Mountain, I strongly support the storage of nuclear waste at Yucca Mountain. How many more thousands of rock samples do we need to further reconfirm what is already known about this site besides engineered and natural barriers and ability to contain radioactive materials for thousands of years.

We need to open Yucca Mountain as quickly as possible and quit talking about it, quit the politics. I understand those from the State of Nevada would be opposing it. That is natural. I probably would too if this were located in Oklahoma, but it is not. This is the place that they have determined, with study after study after study, is adequate to take care of these needs.

I don't know of any scientific changes that would deter me from still supporting the Yucca Mountain site since our last hearing. I have been out there. I have been out there on two occasions. I have gone over with the individuals who are responsible for coming up with the permanent disposal site. I've come to the conclusion that that is the only one that is out there. I think we need to keep moving on with it, in particular, with the progress that is being made right now, the applications.

So, Mr. Chairman, you have your work cut out for you. I don't think there is any—there used to be a lot of controversy on the issue of nuclear energy, and you don't hear much of it any more. It is cheap. It is plentiful. It is abundant. It will handle the crisis that we are faced with now, the energy crisis. So I applaud you for your prioritizing this and I want to join you in your efforts to make this become a reality.

We've done a lot with the NRC in the last few years. They have cleaned up their opportunity. They've increased their capacity. They are going to need our help now, I think, Mr. Chairman.

Thank you.

[The prepared statement of Senator Inhofe follows:]

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

Today's hearing on the disposal options for commercial nuclear waste is a continuation of an earlier hearing that the full committee had on March 1, 2006. I thank the Chairman for having this hearing as it further reinforces both the committee as well as the subcommittee's resolve in wanting to find a national disposal solution for one of our country's most significant and reliable sources of energy.

Over the past year, Congress has accomplished a lot in promoting the nuclear renaissance. Mr. Chairman, it was only 7 months ago that the then Chairman of the NRC, Mr. Diaz, had informed us that he was expecting 11 combined construction and operation license (COLs) applications by 2009 for new nuclear plants. However, today I am happy to hear that the NRC now anticipates 19 COLs within the next 3 years.

Mr. Chairman, I specifically credit this renewed nuclear renaissance to key critical nuclear provisions that we in this committee crafted such as NRC reforms, security, liability insurance, and human capital provisions combined with other nuclear key provisions such as risk insurance, production tax credits, and loan guarantees.

Though I am pleased with the ongoing efforts by both the NRC and DOE in implementing these critical nuclear provisions, I remain extremely concerned about

the NRC's ability to address the increase amount of workload required to review the increasing number of COLs while simultaneously preparing for the Yucca Mountain license application due from the DOE in 2008. Mr. Chairman, I know that you have been instrumental in assisting the NRC to address increased staffing and space needs and I thank you for all of your efforts.

Given NRC's increased workload over the next 3 years in reactor licensing, I am skeptical about new legislation that will require the construction of about 37 interim sites to be built around the country to store nuclear waste. First, I question whether the DOE can select and submit over 30 license applications to the NRC within 300 days of enactment of the legislation. Second, the NRC simply cannot review these applications in 32 months. In addition to interim storage, the committee is also concerned about the timeline associated with the Global Nuclear Energy Partnership (GNEP). For instance, it is my understanding that funding for nuclear programs at universities were eliminated to support GNEP. In addition, some of DOE's funding for the Nuclear Power 2010 Program which is critical for the Combined Construction and Operation License (COL) application process for new nuclear power plants was reduced to further support GNEP. Also, for the successful implementation of GNEP, the NRC will be required to license fuel reprocessing plants as well as fast reactors. This will further strain NRC's limited resources and capabilities.

As you know from our committee's earlier hearing on Yucca Mountain, I strongly support the storage of nuclear waste at Yucca Mountain. How many more thousands of rock samples do we need to further re-confirm what is already known about this site's engineered and natural barriers ability to contain radioactive materials for thousands of years? We need to open Yucca Mountain as quickly as possible. Though I find the interim storage option intriguing, I am concerned about the impact on our resources in shifting the debate from long-term storage to interim storage. I believe that this must be fully debated on the Senate floor and not attached to an omnibus appropriations bill. Furthermore, I do support in principle the future need for GNEP as our country will need a closed nuclear fuel cycle. However, I question the timing of this elaborate program at the DOE and fear that this program can be a major distraction from other programs at the DOE that focuses on the immediate construction and operation of commercial nuclear plants. In a time of shrinking budgets, I would recommend that the Department prioritize its budget to be more in line with the immediate energy needs of our country.

I am not aware of any scientific changes that would deter me from still supporting the Yucca Mountain site since our last hearing. It is for this reason that I have introduced S. 2610 to help expedite the licensing, construction, and operation of Yucca Mountain. I hope that my fellow colleagues in this committee as well as in the U.S. Senate will support this critical piece of legislation in helping to send the clear signal to investors that our country like so many of our competitors is serious in resolving our national and global energy needs.

I would like to thank the Chairman again for having this hearing and look forward to hearing from our distinguished witnesses.

Senator VOINOVICH. Thank you, Senator Inhofe.

Senator Carper.

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

Senator CARPER. Thanks, Mr. Chairman.

I think this is the third Nuclear Regulatory Commission oversight hearing that this subcommittee has held this year, and you and I and our staffs have worked hard to ensure that the NRC is effectively fulfilling its oversight mission. As Chairman Inhofe said, we have about 19 nuclear power reactors that have been proposed to be built. I welcome that. And we sought to ensure that the NRC not only has enough funding to do this additional work, but also has the human capital and the office space that is needed to enable them to do that work.

In sum, we have sought to ensure that the NRC is prepared to manage the burgeoning renaissance of nuclear power in this country.

One of the bigger issues has been alluded to by almost everyone who has spoken this morning, and it is one of the issues that stifle the interest to date in new nuclear powerplants, is how to manage the waste. The Department of Energy began seriously contemplating options for long-term storage of nuclear waste in the 1970s. That is before a lot of people in this room were even born.

In 2002, the Department recommended Yucca Mountain to be the site to house the Nation's nuclear waste. Since then we have seen a number of policy and political battles over Yucca Mountain. In addition, the Department of Energy continues to alter its plans for the site, and at the same time to propose alternative methods for managing our nuclear waste.

At this time, I think there are at least four different proposals that have been offered for addressing nuclear waste. One of those, of course, is Yucca Mountain. A second is reprocessing through some kind of Global Nuclear Energy Partnership. A third would be an interim storage proposal. That is, I think, part of the energy and water appropriations bill. And a fourth is just the status quo, to simply leave things as they are.

We all know it is not the intent of this hearing to argue the merits of those particular four options. What we are here to discuss is what impacts these four proposals or options could have on the Nuclear Regulatory Commission and whether or not the Commission is currently prepared to fulfill their responsibilities associated with each of these approaches.

That having been said, we look forward to the testimony of the witnesses and the opportunity to have a dialogue with them.

Thank you.

Senator VOINOVICH. Thank you, Senator Carper.

Our first panel of witnesses are both with the Department of Energy: Mr. Edward Sproat, who is the Director, Office of Civilian Radioactive Waste Management; Mr. Shane Johnson, who is the Principal Deputy Assistant Secretary, Office of Nuclear Energy.

Mr. Sproat and Mr. Johnson, we really appreciate your coming here today for this oversight hearing. We are going to give each one of you 5 minutes to give your opening statement. Of course, your entire written statement is in the record.

Mr. Sproat, we will begin with you.

STATEMENT OF EDWARD F. SPROAT III, DIRECTOR, OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT, U.S. DEPARTMENT OF ENERGY

Mr. SPROAT. Good morning, Mr. Chairman, Senator Carper, Senator Jeffords. Thank you very much for the opportunity to appear before you this morning to talk about nuclear waste and, in particular, Yucca Mountain, which is my area of responsibility in the Department of Energy.

I have been in my job now for approximately 12 weeks and have gotten in pretty deep as to what is going on in the Department with Yucca Mountain, and I am prepared to talk to you and answer whatever questions you may have this morning regarding that program.

I would like to take just a couple of minutes to begin to talk about Senate bill 2589, which was introduced by Senator Inhofe

and Senator Domenici, and on behalf of the President, the Secretary, and myself, I would like to express our appreciation for introduction of that bill.

I appeared in the House about 6 or 7 weeks ago and announced a new schedule for Yucca Mountain which included the major milestones of submittal of a license application to the NRC by June 2008 and the best achievable schedule of opening a repository by March 2017. I received some criticism for that schedule, as a number of people said, "well, we don't think that is realistic."

I just want to make very clear to this committee that that is a best achievable schedule. I didn't say it was the most probable schedule. There is a difference, because there are a number of issues which are currently outside of the control of the Department of Energy that need to be addressed in order for us to meet that best achievable schedule of March 2017. Senate bill 2589 addresses the vast majority of those issues, which we feel we need to address to be able to make that best achievable date.

So if we don't have that legislation or the key elements of that legislation to help us, we won't be able to meet that March 2017 date, and I would just like to speak very, very briefly and very quickly about some of the key issues in there, because there is a lot of misunderstanding around some of them in the Senate, in the House, and in the public.

The very first issue is around the funding for Yucca Mountain and the use of the Nuclear Waste Fund. I think you are all aware there is a lot of money in that Nuclear Waste Fund that has been paid for by the ratepayers of this country. What we are asking for here is that the annual revenues coming into the Federal Government for the waste fund be counted as discretionary, and therefore, the Appropriations Committees can allocate those incoming receipts to Yucca Mountain, appropriate them for Yucca Mountain without counting against the budget caps of the Appropriations Committees.

We are not asking for removal of Congressional oversight. We are not asking for removal of Congressional appropriations. We are just asking that the annual receipts be reclassified as discretionary receipts so that the Appropriation Committees in both Houses are able to allocate those receipts without coming against their budget caps.

The second issue we have is we are asking for withdrawal of land on the Nevada Test Site around the Yucca Mountain repository, itself. What we are asking for there is to give the Department and the Secretary of Energy the ability to have permanent control over that land and decide how that land is to be used. I need to have that ability to exclude other public uses other than for nuclear waste disposal in order to get a license from the NRC. We have to show that we have permanent control of that land to the NRC before we can get an operating license for Yucca Mountain.

The third issue—and this goes directly at the issue that Senator Jeffords brought up about do we already have Yucca Mountain filled up, will it have enough capacity to handle spent nuclear waste from the country, which is a very legitimate issue, and it is an issue that directly impacts the future of nuclear energy in this country.

Currently, in the Nuclear Waste Policy Act there is an administrative limit placed by the Congress on Yucca Mountain of 70,000 metric tons. We will have, with the existing fleet of plants and with the license extensions that those plants have gotten, we will have basically filled Yucca Mountain with the existing fleet of plants within the next 3 to 5 years, have that full 70,000 metric ton limit committed.

In addition, the 10 percent of the 70,000 MTHM that has been allocated to Defense waste materials, including spent Naval nuclear fuel, will occupy approximately one-third of the volume of the respository.

So it is very important. What we are asking for in this legislation is that that administrative cap of 70,000 metric tons be lifted and allow us to present a technical case to the NRC as part of our licensing process as to what the maximum licensable capacity limit of Yucca Mountain should be, and let the NRC determine that as part of the licensing process. So we are asking permission to allow the NRC and the Department of Energy to make a technical decision as part of the licensing process for Yucca Mountain as to what that upper limit should be.

We have already done an environmental impact statement for Yucca Mountain which considers and analyzes up to 120,000 metric tons to be stored there. So this is an important issue, as Senator Jeffords has pointed out.

The fourth issue which has generated some interest, particularly among folks in the western States, is the issue of water. What we are asking for is the Senate to declare basically the Yucca Mountain project is in the public interest. The reason we are doing that, as of right now, the State Legislature in Nevada has declared this project as not in the public interest, and therefore the State water engineer in Nevada is not allowed to give us a water permit.

So without a water permit, it is going to be very hard to build and operate Yucca Mountain. We are not asking to bypass the State's rights; what we are asking for is to just have a hearing and be able to go in front of the State water engineer and make a technical case as to the water we need for the period we need it.

The fifth area is on waste confidence, which is a major issue for a lot of folks. It directly impacts our future ability to build new nuclear plants. Right now the NRC has a waste confidence rule that says they believe that there is a high confidence that the Federal Government will have a place to put its spent nuclear fuel by the year 2025. We are asking basically Congress to say we believe also that we will have a long-term plan and a policy in this country to handle nuclear waste, and therefore, the NRC no longer has to consider 2025 as a hard date, and basically to address the issue that way.

The next area is transportation. How do we get the waste to the Mountain? There has been a lot of misunderstanding around this, also. All we are trying to do here is to clarify that the Department of Energy has the right and has the authorization to transport nuclear waste under the Atomic Energy Act, which we already do, but that, in cases where there may be a State or a county or locality that is obstinate in preventing us from shipping on through a preferred route that has been planned and agreed upon through the

various planning processes with local involvement, that we are able to use a preemption rule with the Department of Transportation: that basically we can appeal to the Department of Transportation to preempt local objections on a specific route. We are not planning on changing any of the way we participate or plan these transportation routes with the public as part of this legislation.

Senator VOINOVICH. Mr. Sproat, your time is up.

Mr. SPROAT. Thank you.

In summary, let me just say, Senator, I appreciate the opportunity to talk about this, and both the President, the Secretary, and I strongly urge respectfully that the Senate and the Congress consider this legislation.

Senator VOINOVICH. Thank you very much.

Mr. Johnson.

STATEMENT OF SHANE R. JOHNSON, PRINCIPAL DEPUTY ASSISTANT SECRETARY, OFFICE OF NUCLEAR ENERGY, U.S. DEPARTMENT OF ENERGY

Mr. JOHNSON. Mr. Chairman, Senator Carper, Senator Jeffords, it is my pleasure to be here this morning to discuss the Department's activities associated with building new nuclear capacity in the United States. As a new generation of nuclear powerplants and advanced fuel facilities is designed, licensed, and constructed in the United States, it is certain that the Department's joint Government-industry initiatives will have near-term, mid-term, and long-term implications for the Nuclear Regulatory Commission.

Through our Nuclear Power 2010 program and the nuclear-related provisions of the Energy Policy Act of 2005, Government and industry are working together to address the regulatory and financial impediments facing the first purchasers of new advanced light water reactors. The Department is currently sponsoring cooperative projects for preparation of Early Site Permits for three commercial nuclear plant sites. The three ESP applications are currently in various stages of NRC review, and licensing decisions are expected by the end of 2007.

We have also established cost-shared demonstration projects with two power-company-led consortia to obtain construction and operating licenses (COLs) from the NRC. Both consortia are on track to submit COL applications to the NRC in late calendar year 2007. Industry's expectation is that the NRC will issue the licenses by the end of 2010, making it possible that the utility decision to build a new plant could be announced as early as 2008, construction starting in 2010, and a new plant operational by 2014.

The progress to date in our Nuclear Power 2010 and in implementing the nuclear provisions of the Energy Policy Act has already encouraged 12 companies to publicly announce their intent to apply for licenses for nearly 30 reactors. In addition to the near-term deployment of new nuclear powerplants, the Department is addressing the fundamental R&D issues of next-generation nuclear energy concepts. We are currently supporting R&D for a prototype high-temperature reactor capable of producing both electricity and hydrogen.

The expectations for the development, design, and demonstration of this new facility, called the Next Generation Nuclear Plant, are also outlined in the Energy Policy Act.

As directed by the Energy Policy Act, the Department has begun working in earnest with the NRC to jointly develop a licensing strategy for this new technology.

Finally, we are implementing the Global Nuclear Energy Partnership, or GNEP, an initiative announced earlier this year by the Department as part of the President's Advanced Energy Initiative. GNEP is a comprehensive strategy to lay the foundation for expanded use of nuclear energy in the United States and the world by demonstrating and deploying new technologies that recycle nuclear fuel, significantly reduce waste, and advance nuclear nonproliferation objectives.

As part of this initiative, we are pursuing the development of an integrated spent fuel recycling facility and the development of a fast reactor capable of consuming those usable products from spent fuel while producing electricity.

DOE expects to work closely with the NRC in developing the regulatory framework for licensing these advanced facilities. As I described in my testimony, the Department has several ambitious and concurrent initiatives underway which pave the way for the resurgence of nuclear power in the United States and around the world. Each of these initiatives carries its own set of licensing issues and requirements, albeit it on varying implementation schedules. NRC's ability to fulfill their licensing role in a timely and effective manner is a critical requirement for the successful resurgence of nuclear power in the United States.

Thank you.

Senator VOINOVICH. Thank you very much.

According to the Nuclear Waste Policy Act of 1982, the Yucca Mountain site should have been licensed and operational since 1998. You are giving us a number of March 2017. That is almost 20 years later. But we are told that the Department of Energy 2008 to submit that license application, and how confident are you that we are going to be able to do that?

Mr. SPROAT. I'm very confident we can do that. Let me just say we are not targeting that date. The date is on or before Monday, June 30, 2008. I'm very clear with that. We are putting in place a very specific, very aggressive project management process and team. We are taking a different approach in doing the license application than has been done before. I am highly confident that we will have a high-quality, docketable license application into the NRC no later than June 30, 2008.

Senator VOINOVICH. As you know, the Senate Energy and Water Development Appropriations Subcommittee unanimously reported out of committee the spending bill of 2007, which calls for DOE to approve over 30 interim storage sites in States or regional compacts that are in close proximity to commercial sites for a period up to 25 years. Given the Department's track record on the Yucca Mountain application, do you believe that DOE is capable of preparing and submitting licensing applications to the NRC in the 300 days allotted time?

Mr. SPROAT. Well, being new to the Department, I can't speak about past track record. What I can tell you is, based on the work I have on my plate to get the Yucca Mountain license application in and to get it licensed, and given the resources I have to do that and the team I am trying to build to do that, any additional work for additional interim storage in that time period would be highly distracting and very difficult to perform to meet that schedule.

Senator VOINOVICH. It is very difficult to perform?

Mr. SPROAT. Very difficult to perform.

Senator VOINOVICH. Distracting, yes, but difficult to perform.

Mr. SPROAT. Very difficult to perform to that kind of a schedule. I have, in fact, earlier in my career been involved in licensing, and construction of an interim spent fuel storage facility at a nuclear powerplant, so I know about how long it takes, how much it costs, and just at a plant that you already have a site licensed for between the time you decide you are going to undertake this, do the studies, do the design, do the licensing, do the construction, you are talking probably in the neighborhood of 4 to 5 years. If you are doing it away from reactor, the siting process, the regulatory process, the environmental impact process will extend that timeframe significantly.

Senator VOINOVICH. As Governor, we contemplated siting a low-level radioactive waste facility, and I understand it is not an easy process. This is away from where it is now being stored to some other place, and the whole NIMBY problem and the rest of it just gets to be very, very difficult.

Mr. SPROAT. The actual construction time is relatively short compared to the amount of time it takes for licensing and studies and litigation before you can actually start construction.

Senator VOINOVICH. In terms of the interim storage provision, how would DOE fund it? Would the funding come from the Nuclear Waste Fund or from taxpayers?

Mr. SPROAT. I don't believe that is clear in the legislation, and I don't believe DOE has a position on that issue at this time.

Senator VOINOVICH. We've collected, what, $27 billion, and we are collecting another $750 million every year.

Mr. SPROAT. That is correct.

Senator VOINOVICH. How much is left in that storage fund? Does anyone know?

Mr. SPROAT. We have spent approximately $9 billion over the life of the program. The current balance is, I believe, around $17 billion, about $18 billion.

Senator VOINOVICH. Well, is the money there or has it been spent and borrowed?

Mr. SPROAT. No. I have been assured by my staff we are holding Government paper in a file drawer that is a laddered approach, you know, bond approach in terms of that, so we believe we are holding good Government paper to back up that investment.

Senator VOINOVICH. Will it require some appropriations from Congress to pay for it?

Mr. SPROAT. Well, let me try and answer the question. We are not anticipating appropriations from Congress to pay for Yucca Mountain. Is your question more about interim storage or Yucca?

Senator VOINOVICH. Well, basically, is the money like so many other trust funds that we have where there are IOUs and promises to pay but the money has been spent, and when it comes time to start construction you have to pay back that money. My question is: where does the money come from? It has not been put into some special investment fund, has it? Or has it?

Mr. SPROAT. We are holding Government investments in our laddered account that we would intend to draw upon when we need to draw down.

Senator VOINOVICH. I'd like to have a memorandum on that explaining what it is, how much is there, what kind of debt is there.

Mr. SPROAT. Absolutely.

Senator VOINOVICH. Because I have been led to believe that it will be like so many other trust funds——

Mr. SPROAT. I will be glad to——

Senator VOINOVICH [continuing]. That we have to repay them.

Mr. SPROAT. I will be glad to take that question for the record and give you a very detailed explanation of how those investments are set up and laddered in that fund.

Senator VOINOVICH. Good.

[The referenced information follows on page 49.]

Senator VOINOVICH. Senator Carper.

Senator CARPER. Thanks.

I would like to come back to the issue of interim storage in the Nation's spent fuel management program. I believe it is in the energy and water appropriations bill, the idea of this interim storage locations across the country. Could both of you comment on that just briefly, what's good about it, what's bad about it, problems, attributes.

Mr. SPROAT. Let me try and talk about why would we want to do interim storage, from a Government perspective. I believe there are two primary reasons. One is to address the issue of waste confidence, on being able to build new nuclear plants and extend the licenses of the existing fleet, and the second is to reduce the Government financial liability associated with DOE's non-performance on the existing standard contracts, because we do clearly have liability for non-performance on a number of contracts.

They are the really two key drivers for interim storage. So however we set up an interim storage scheme, whether it is one site, couple sites, multiple sites, we need to make sure that we are addressing both of those issues: that waste confidence has been adequately addressed through that scheme and that the total cost to the U.S. taxpayer as a result of the cost of setting up that interim storage, getting it licensed, and the timeframe it is going to take to get it operational compared to the timeframe it is going to take to get Yucca Mountain operational, that it is a net win for the taxpayers of the United States.

Senator CARPER. How can we make it a net win for the taxpayers of Oklahoma, where we are going to put all these—no, we are not going to do that—or Ohio or Delaware or Vermont? How can we make it a winner for those folks? I don't think we've ever convinced the people of Nevada that this is a winner for them, and if we had done a better job of that we might not be looking at a 2017 date.

Mr. SPROAT. That may be the case, but I certainly wouldn't put blame on the folks in Nevada as being the primary reason why this has been taking so long. There are other issues around the long-term management of the program, the approach it has taken, that I say probably bear a lot more responsibility than the folks in Nevada.

Senator CARPER. Senator Voinovich, a former Governor, talked about the low level radioactive waste. I have seen that movie, too, in Delaware and Pennsylvania as we have tried to come up with a site just for hospital waste and stuff like that. How do we make, with respect to interim storage, whether it is whatever State or States it is going to be in, how do we make it a winner for those States?

Mr. SPROAT. One of the proposals I know——

Senator CARPER. Excuse me. I don't envision us having a competition among the States that they can be the first or second or third to be the site chosen, but at least we want them to feel like there's something in it for them.

Mr. SPROAT. You are absolutely right, Senator. I think what you see happening with PFS out in Utah is an example of people following the rules, doing everything right, but basically the State has said we don't want that here, and it is still stuck. There has been some discussion and it has some merit to see who is out there, if a package of financial incentives combined and linked to the GNEP initiative could be enough to spur local interest in being willing to host what we would call in-process storage; in other words, a place where the fuel would sit. It is kind of like an inbox to the GNEP process.

Senator CARPER. I want to talk about GNEP, but before we do just a quick question on some of the Indian tribes, Indian nations and the roles that they are seeking to play in this regard. Just a quick comment on that.

Mr. SPROAT. Well, the only one I am aware of is——

Senator CARPER. Utah?

Mr. SPROAT [continuing]. in Utah, where PFS is sited, is proposed to be sited. That is on tribal land, and so the tribe had decided that the business deal associated with that was good. Unfortunately, where that stands right now is the consortium, the PFS consortium, has received a license from the NRC to go build that facility, but it is conditioned on a number of issues associated with the ability on the use of the land from a Federal Government standpoint and the transportation issues coming in, and there is resistance at the State level around some of those issues. It is currently being discussed and it may or may not be in litigation. I'm not sure. So that is the only specific Indian tribal involvement with spent nuclear fuel that I am aware of at this point.

Senator CARPER. Thank you.

Gentlemen, a few words on GNEP. Talk to us about how it would work and what its status is so that a layman could understand it.

Mr. JOHNSON. So that a layman can understand?

Senator CARPER. Yes.

Mr. JOHNSON. GNEP is a comprehensive strategy that envisions an expansion of nuclear power not only in the United States but around the globe, and in supporting this expansion of nuclear

power worldwide–GNEP seeks to establish mechanisms by which we can address the two issues that have plagued commercial nuclear power since its inception; what do you do with the nuclear waste and how do you control the nuclear materials from a nonproliferation objective such that you can provide the benefits of nuclear power to the globe in a safe and secure manner.

So the GNEP program envisions both the technology development activity with developing advanced recycle technologies that do not result in separated plutonium to address the nonproliferation concerns associated with that particular nuclear material, burning those elements of the spent fuel that have some useful value in advanced reactors to generate electricity. It also envisions a fuel leasing framework where fuel supply countries would make available fuel to countries for their plants, enabling those countries to have the benefit of nuclear power without that country having to develop and deploy fuel cycle technology such as enrichment facilities or spent fuel reprocessing facilities.

So really the Global Nuclear Energy Partnership is looking at bringing the benefit of commercial nuclear power to the countries of the world so that they have the electricity, safe, reliable, low cost, but we would cap the numbers of countries that have enrichment technologies and process, as well as recycling facilities.

That, in a nutshell, is what the Global Nuclear Energy Partnership is.

Senator CARPER. All right.

I understand the wife of Albert Einstein was once asked, Mr. Chairman, do you understand Einstein's theory of relativity? She said, "I understand the words, but not the sentences." I understood most of the words, some of the sentences. It is obviously one I need to go to school on, but I think it has potential and promise and I look forward to learning more. Thank you.

Mr. JOHNSON. Thank you, sir.

Senator CARPER. I'm going to run over to the floor, Mr. Chairman, for a few minutes. I will be right back.

Senator VOINOVICH. Senator Jeffords.

Senator JEFFORDS. Mr. Chairman, before I begin my questions, I would like to ask consent for two items. First, the Democratic Leader, Senator Reid, would like to submit a statement for the record. I assume that will be appropriate.

Second, I would like to submit letters I have received from the Governor of Vermont and Vermont's Attorney General on matters that will be discussed in this hearing.

Senator VOINOVICH. Without objection.

[The referenced documents follow on page 36].

Senator JEFFORDS. Mr. Sproat, you stated that DOE will submit a Yucca Mountain license application to NRC in 2017 only if Congress passes legislation to eliminate impediments. We have a law, the Nuclear Waste Policy Act, that DOE was supposed to take waste beginning in 1998. In order to keep to the 2017 date, how long do you assume it would take for Congress to act? Are you giving us until the end of September, the whole next Congress, or just how long do we have?

Mr. SPROAT. I probably wasn't clear in my opening statement, Senator. Just to be clear, I said that we would be submitting the

license application by June 2008 and the best achievable date for opening Yucca Mountain, making it actually start operating, is March 2017, so I just wanted to be clear about those two dates. It is license application by mid–2008 and best achievable schedule to open would be March 2017.

I don't need this legislation that we gave you in order to submit that license application. I have all the authority I need as long as the appropriations are still set by the Congress to adequately fund the program. I will submit that license application no later than June 2008.

But I won't be able to get a license from the NRC to actually build the repository unless some of those key issues that I spoke about in my opening statement are addressed through legislation.

Senator JEFFORDS. Thank you. Mr. Sproat, one reason you give for DOE's interest in legislation is that the Department wants to assume responsibility for nuclear waste transport. What are the DOE's plans for implementing a dedicated train program for rail shipment of nuclear waste for the roughly one-third of reactors in the United States that do not have rail access?

Mr. SPROAT. Very good question, Senator. The Department of Energy has a responsibility as part of the Yucca Mountain program to accept the waste, transport it across the country, and get it to Yucca Mountain. That is clear. Our preliminary studies have indicated the preferred way of doing that is via rail and doing it with dedicated trains. In other words, so we have a dedicated fuel train. From a security standpoint and a transportation and logistics standpoint, that makes a lot of sense.

There are certain plants that have either had rail spurs to them when they were built which are no longer in service, which may need to be enhanced, and there are other plants that have never had rail spurs but have either road access or waterway access.

One of the areas that has suffered in this program due to funding shortfalls over the past 3 to 4 or 5 years is specifically transportation planning. When I came in I set four strategic objectives for this program. No. 4 was moving forward intently with the transportation planning process. So, to be able to answer your specific question or so what are you going to do with these plants that don't have rail spurs, additional transportation planning is required before I can really answer that; however, I would point out all of these plants were built with very heavy components in them, whether they are reactor vessels or steam generators or whatever, and they were either brought in by road, by rail, or by waterway. We would use probably the similar routes to get the spent fuel out. But until we do the detailed transportation planning that has been lacking so far, I can't answer your specific question on a specific plant basis.

Senator JEFFORDS. Thank you.

Mr. Johnson, I want to ask you about the waste produced by the Administration's proposed nuclear waste reprocessing program. Do we currently have appropriate storage and environmental regulations that would manage the type of nuclear waste produced by a large-scale reprocessing program?

Mr. JOHNSON. As we envision the program, we would produce waste products that are consistent with the existing environmental

regulations and laws, so the product that is engineered would meet the requirements that are on the books today.

Senator JEFFORDS. Mr. Johnson, some have suggested that reprocessing would eliminate the need for Yucca Mountain. Does the Department share that view?

Mr. JOHNSON. No, sir. Yucca Mountain is required under any fuel cycle scenario, whether we maintain the current fuel cycle or we close the fuel cycle through recycling spent fuel and the use of fast reactors or thermal reactors, but a geologic repository is required for any scenario.

Mr. SPROAT. If I could just add to that, Senator, just to give you a very specific reason why, as I said in my opening statement, one-third of the Yucca Mountain capacity, that 70,000 metric ton current capacity, will be taken up by high-level Defense waste and Naval spent nuclear fuel. That is not recyclable material and it has to go somewhere and it is sitting around different places, primarily in Idaho and Savannah River in Georgia and a few other places. It needs to go into Yucca Mountain. We need a deep geological repository.

Senator JEFFORDS. Thank you.

Thank you, Mr. Chairman.

Senator VOINOVICH. Thank you both for your testimony today.

We are going to have a vote at 11 o'clock, so I am going to shorten the question period today, but I have several more questions that I am going to submit for the record and would appreciate your getting back to me with the answers to those questions.

Senator VOINOVICH. Thank you very much for being here. I was impressed, Mr. Sproat, with your commitment in terms of the time line.

Mr. SPROAT. We will make it.

Senator VOINOVICH. Thank you.

Mr. JOHNSON. Thank you, sir.

Senator VOINOVICH. Mr. Reyes, welcome back. It is nice to see you.

Mr. Reyes is the Executive Director for operations of the Nuclear Regulatory Commission.

Mr. Reyes, we look forward to your testimony.

STATEMENT OF LUIS REYES, EXECUTIVE DIRECTOR OF OPERATIONS, U.S. NUCLEAR REGULATORY COMMISSION

Mr. REYES. Mr. Chairman and members of the committee, it is a pleasure to appear before you today on behalf of the Nuclear Regulatory Commission to discuss our capability to regulate the storage and disposal of spent nuclear fuel.

Specifically, I plan to address some of the national spent fuel management strategies embodied in the various legislative proposals currently under consideration by Congress. I also plan to discuss some of the implications of the Global Nuclear Energy Partnership.

Since I plan to summarize my testimony, I will ask that my full statement be entered into the hearing record, including an update to page No. 6.

Senator VOINOVICH. You can be assured of that.

Mr. REYES. It is important to make clear at the outset that, because of our role in the regulation of spent nuclear fuel and our potential role in considering an application for a high-level radioactive waste repository at Yucca Mountain, NV, the Commission has not taken a position on most of the provisions in these legislative proposals; therefore, I would like to focus on the impact certain of the proposals will have on the NRC.

We have reviewed the committee's bill, S. 2610, and note that some provisions in the bill could affect the timing of our review of a Department of Energy application for an authorization to receive and possess spent nuclear fuel and high-level radioactive waste at Yucca Mountain. Specifically, the committee's bill will require us to reach a final decision and receipt and possession within 1 year with the possibility of a 6-month extension. Such a requirement would not allow us enough time to complete both our safety review and the required adjudicatory proceeding in one year.

We have also reviewed the language contained in the Senate appropriations bill and believe that our existing regulatory infrastructure could accommodate alternative approaches to storing spent nuclear fuel. We believe that we may be able to review and license concurrently the large number of new facilities anticipated in the bill; however, in order to do so we will need sufficient funding, the receipt of complete, high-quality license applications, and considerably more time to review and adjudicate the applications.

The changes to our national spent fuel management strategy that are being considered in the various bills involve shipping spent fuel. Provisions in the bills may affect the transportation roles of the Department of Energy and the Department of Transportation, but do not appear to affect our role with respect to certifying casks as specified in the Nuclear Waste Policy Act.

The NRC believes that the existing transportation regulatory infrastructure can accommodate the various legislative actions being considered; however, as with the other topics addressed in its testimony, our ability to complete this work will depend upon sufficient appropriations and the submittal of complete, high-quality applications.

We have been meeting regularly with the Department of Energy to keep informed and discern our role in the Global Nuclear Energy Partnership program as it unfolds. If we are to have licensing responsibilities in both the spent fuel separations, fuel fabrication facility, according to the Department schedules, then we must make changes now to ensure that our regulations and guidance documents provide appropriate stability and predictability in our regulatory reviews.

To facilitate the technical review and ensure a timely licensing process for new technologies, we will need to revise existing regulations or develop new regulations and associated guidance documents. Also, we will need to begin recruiting for new employees while developing expertise among existing staff in separations and advanced reactor technologies.

In conclusion, the Commission understands the importance of addressing the storage, transportation, and disposal of high-level radioactive waste in a systematic and integrated manner that is safe, timely, and efficient. We urge Congress to assure that sufficient ap-

propriations be made available to adequately fund regulatory infrastructure activities and increase staffing prior to the receipt of new license applications.

Provided that we receive sufficient resources, staffing levels are maintained, and appropriate time is given to the Agency to conduct its technical reviews and adjudications, we believe we can reach decisions on the relevant applications in a timely fashion, assuming high-quality license applications are received.

Finally, I would like to thank you, Chairman Voinovich and Senator Carper, for your support and the assistance of your staff. In addition, I would like to thank Chairman Inhofe and Senator Jeffords for their assistance.

As this might be our final hearing this year with the committee, I would like to take the opportunity to wish Senator Jeffords many years of enjoying his retirement. It has been a pleasure to work with him and your staff over the years, and we wish you well.

Thank you, sir.

Senator VOINOVICH. Thank you, Mr. Reyes.

How many of the COLs—Senator Inhofe referred to 19—do you think you are going to be getting in the next 2 to 3 years?

Mr. REYES. We think that all 19 COL applications that include more than 28 nuclear units are coming in in the years 2007 through 2009, and we are prepared to receive those applications.

Senator VOINOVICH. So the applications would be, at this stage of the game, 19?

Mr. REYES. Nineteen combined operating licenses for more than 28 nuclear reactors.

Senator VOINOVICH. Twenty-eight facilities.

The question that I have is: where are you in terms of hiring the people that you need to get the job done? And, No. 2, share with us the status of the issue of having the space for these people to operate.

Mr. REYES. The Agency has, as you know, a very experienced staff, and we were at a goal to have a net gain of 200 employees this fiscal year. I am glad to report that we have exceeded that. We have a net gain of over 200 employees this year. But we do have to repeat that for the upcoming years. We do have a very aggressive recruitment schedule already started for the next year. We are going to a lot of universities.

Senator VOINOVICH. Next year or the next years?

Mr. REYES. Correct. Several years. Several years. We are going to repeat the——

Senator VOINOVICH. Do you have the specific number of years?

Mr. REYES. Yes. For the next 3 years, we are planning on trying to net more than 200 employees every year for the next 3 years. Now, our recruitment schedule is very aggressive in terms of universities. In fact, today we happen to have our recruiting team at Ohio State University. We go for the cream of the crop.

Senator VOINOVICH. I will get on the phone and call them. We've talked with those people about keeping the program open and have also talked with the University of Cincinnati that we are going to close down their program, and they have agreed now that they are going to stay with it. But for the people from the Department of Energy, the proposal to cut $27 million from their budget for these

programs, that seems to me ridiculous at this stage of the game and I am hopeful that we can get that money restored to that. I think I would like you to comment about that, if you would.

Mr. REYES. We believe that funding of the university is critical. Our success this year in recruiting is not as difficult as we foresee in the future. This announcement that we discussed about 19 combined operating licenses and decisions that are being made at the board of directors as we speak that are not public yet are creating a need for a large workforce, not only on the utilities who will build and operate facilities, the license preparation, the construction organizations that are going to do that, so we see a large demand in the future and a large competition for the same resources.

You had asked me about space. The picture with space is not as good as recruiting. We are filling our campus at White Flint. We have secure interim space to move some of our employees off campus. We are converting conference rooms and training rooms into offices, and we are working to see if we can get some centralized, permanent location.

If you remember the committee report after Three Mile Island, it criticized the Agency for having the employees located in many places and not having good communications. We want to learn from the past. We do not want our staff spread out through many facilities through the suburbs of Maryland, so we are working very hard to have a consolidated location.

Senator VOINOVICH. You can be assured that I am going to do everything in my power to make sure you get that space.

Mr. REYES. Thank you, sir.

Senator VOINOVICH. Chairman Klein has been quoted as stating that the Commission can license interim facilities for the storage of spent fuel from new and existing reactors, but noted that a Congressional proposal to open such sites in all States with nuclear powerplants could stretch the Commission's resources. The question I have is one that I have asked before: can the NRC practically review over 30 license applications in 32 months? Can you find the needed personnel? Do you have any idea of how many more, in addition to what we've already talked about, just to take care of the COL's you'd have to have in order to do this? Have you looked at that impact it would have?

Mr. REYES. Yes. Let me give you, if we have 30-some-odd facilities to store interim storage of spent nuclear fuel away from reactors, and you assume those 30-some-odd applications come in at the same time for what would be a 30- to 32-month review, the total program cost for that scenario is $300 million and over 200 employees. Now, there are other combinations of the scenario that are not as high, and we will have to wait and see what kind of facilities are being proposed. But, in terms of worst case scenario, all away from reactors, all coming at the same time, you are talking a total program cost of $300 million and over 200 employees. That would be a significant——

Senator VOINOVICH. Is that 200 above the 200——

Mr. REYES. Correct. This is just for this effort, for the 30-some-odd installations away from reactors to restore the interim storage of spent fuel waste, spent fuel. So there's no appropriations. We don't have any budget for those activities, so that would be a sig-

nificant impact to all of our other activities if the situation would remain that way.

Senator VOINOVICH. Well, the question I have is, what, 90 percent of your budget comes from the industry, itself?

Mr. REYES. Correct.

Senator VOINOVICH. Where would the money come from for this? From that same group of people or—have any of you thought about that?

Mr. REYES. I think no, we haven't, because we don't know the scenario yet, but it will be a big impact. Whoever pays for it, it is going to be a significant amount of money.

Senator VOINOVICH. Either for the taxpayers or for the——

Mr. REYES. Either way, it is a significant amount of money.

Senator VOINOVICH. We will find out from the next two witnesses how enthusiastic they are about it.

The next question is the GNEP program. Again, does the NRC have any existing in-house expertise licensing reprocessing facilities and fast reactors as is going to be required under GNEP?

Mr. REYES. We have a very limited number of employees that have experience in either fast reactors or reprocessing technology, so we would have to ramp up not only the number of employees but train them and acquire that knowledge.

Senator VOINOVICH. So, again, it would take some more personnel in order to handle that situation?

Mr. REYES. Yes, sir.

Senator VOINOVICH. The estimated cost of that is $13 billion, yes, $13 billion. Where would that money come from?

Mr. REYES. You mean for the GNEP? I think you are going to have to ask another group, because we would—the cost we can give you is the review process that we will have to go through in reviewing the facilities for GNEP. We don't know yet what that profile looks like in terms of how many facilities and what kind, so we do not have an estimate for that.

Senator VOINOVICH. Okay. That is probably a DOE question.

Mr. REYES. Yes, sir.

Senator VOINOVICH. I would like to have you folks look at this thing and come back in writing about specifically the numbers that you would have to have and talk about the budgetary process and so forth so we get a full—so that we comprehend just what we are talking about here.

Mr. REYES. We will do that.

Senator VOINOVICH. As an editorial comment, it reminds me that today the national debt is the highest it has ever been. In terms of the GDP, it is the highest in terms of GDP in 50 years. The discretionary budget that is available is being hammered, non-discretionary defense budget. We have all these ambitious plans coming from these agencies, and the question is, to put it in the vernacular, where the hell is the money coming from.

These are things that, if they are worthy, we should also be very candid about how you are going to be able to handle the situation, how much is the industry going to be able to sustain, Department of Energy, what's their budget, and where are they going to get the money to get to do some of these things that they are proposing. I think we need to get real and not go off down some path willy-

nilly, not knowing where the money is going to come from to fund these new proposals and initiatives.

Thanks for being here today. We appreciate your testimony and, Mr. Reyes, we look forward to working with you. We have spent a lot of time with you folks and we continue to do it because we think that what you are doing is extremely important to our country's competitiveness. We certainly need more nuclear power. We need to move away from using natural gas.

Nuclear power also is very friendly in terms of the environment. Hopefully, with some of the new technology that we have, we can start to share that with other places around the world, and we are working on that problem, too. So thanks for being here today and keep up the good work.

Mr. REYES. Thank you, sir.

Senator VOINOVICH. Good morning. I would like to remind you, if you can keep your remarks to 5 minutes I would appreciate it.

Our first witness is Admiral Frank "Skip" Bowman, who is president and chief executive officer of the Nuclear Energy Institute.

Welcome, Admiral.

We will hear from Mr. Victor Gilinsky, who is an independent energy consultant. I should point out that Mr. Gilinsky served as an NRC commissioner in the late 1970s and early 1980s.

I think you've testified before this committee before, haven't you?

Mr. GILINSKY. A long time ago, sir.

Senator VOINOVICH. Yes. So we are pleased to have you here today.

We will begin with Admiral Bowman.

STATEMENT OF ADMIRAL FRANK L. "SKIP" BOWMAN, U.S.N. (RETIRED); PRESIDENT AND CEO, NUCLEAR ENERGY INSTITUTE

Admiral BOWMAN. Mr. Chairman, thank you very much for the opportunity to testify today and express the nuclear industry's views on legislation to address the management of used fuel.

We applaud this committee and you, personally, for your leadership in enacting the Energy Policy Act last year, with the strong incentives in that act to build new nuclear plants to meet the rising electricity demand in this country.

Just to clear the air and for the record, as of this morning we have 12 companies pursuing 19 applications for 30 new reactors.

Senator VOINOVICH. You have 12 companies——

Admiral BOWMAN. We have 12 companies pursuing 19 COL applications for 30 reactor plants.

This morning I will focus my oral testimony on the following key issues: first, the Department of Energy must make measurable progress in implementing an integrated national strategy for used fuel management, including development and operation of the Yucca Mountain repository; second, S. 2610 can help address challenges facing both the DOE and the NRC on the Yucca Mountain project; third, I believe Congress must take additional actions beyond S. 2610 to remove used fuel from commercial nuclear powerplants quickly.

I would request that my written statement, which addresses these issues in more detail, be entered into the record.

Senator VOINOVICH. It will be entered.

Admiral BOWMAN. Thank you, sir.

We are very encouraged by Mr. Sproat's testimony and his enthusiasm and the DOE's recently announced schedule to submit a license application for Yucca Mountain by June 30, 2008, as well as the, in Mr. Sproat's words, best achievable construction schedule that could lead to receipt of used fuel by March 2017. However, we also recognize that factors outside the Department and outside Mr. Sproat's direct control could influence its ability to achieve that schedule. Two of those factors I believe are passage of the Nuclear Fuel Management Disposal Act, S. 2610, and ensuring NRC's resources do match upcoming requirements to the questions that you were asking Mr. Reyes.

The industry strongly supports S. 2610. It should be enacted, along with the provisions in S. 2589, the parent legislation which Chairman Inhofe introduced along with Chairman Domenici, and also additional provisions which I will discuss today.

Managing the Nation's used fuel is a Federal obligation and a matter of broad national policy, under the purview of the American people's elected representatives. Congress should codify "waste confidence" called for in S. 2610 so that the Nuclear Regulatory Commission need not address this broad policy issue as a matter of routine regulatory technical issues that could unduly delay the approval and review process for new plant construction.

Already addressed this morning is the artificial limit of 70,000 metric tons on the amount of nuclear waste materials that can be accepted at Yucca Mountain. Scientific analysis that has been done suggests significantly higher capacity easily could be achieved beyond the legislated limit. Advanced nuclear fuel cycle technologies could provide significant additional capacity for disposing of waste products in Yucca Mountain.

The NRC repository licensing process should also be restructured as called for in S. 2610. S. 2610 takes into account the unprecedented scope and duration of environmental reviews that will be required during the construction and licensing process for the Yucca Mountain facility. It appropriately separates those non-nuclear and non-technical issues related to infrastructure support activities from repository licensing and operations. This legislation also recognizes the stringent Federal standards that will apply to the repository and eliminates unnecessary dual regulation.

We would also encourage Congress to incorporate additional features into the repository development that will give future generations the flexibility to make informed decisions, as members of your committee have already discussed today, based on operational experience, changing energy economics, and technological developments. It should be made clear that the repository is intended to retain the ability to monitor and, if needed or desired, to retrieve the used fuel resources for at least 300 years.

DOE should take action as soon as possible to remove used fuel from the Nation's plants. This is the industry's top priority, and it is the Federal Government's statutory and contractual obligation to do so, an obligation in which it is 8 years in arrears. This action should be part of an integrated Government plan to exercise proper stewardship over used nuclear fuel.

In order to address legitimate questions about the Government's used nuclear fuel stewardship, the United States should have a credible, long-term program to manage nuclear fuel. This program should integrate a number of essential components, including the centralized disposal facility at Yucca Mountain as the bull's eye, but also advance proliferation-proof fuel processing and fuel fabrication facilities and advanced reactors designed to extract the maximum possible energy from used nuclear fuel and to reduce the radiotoxicity and volume of the waste byproducts.

The third element that should be included is one or two interim storage facilities. Mr. Chairman, I would reiterate that no one in industry has ever supported or commented favorably on any number larger than a few interim storage facilities. We think the prudent approach, would be to colocated them with facilities for developing advanced fuel processing and recycling.

Used nuclear fuel is stored safely today at nuclear powerplants, either in pool storage or in dry casks. That said, however, I think that it is absolutely essential to public and State policymaker confidence that the Federal Government identify and develop a limited number of sites for centralized interim storage, ideally linked, as I said, to future reprocessing facilities, and begin the process of moving used nuclear fuel to these one or two interim storage facilities soon. Further delays in Federal receipt and movement of used fuel and Defense waste products will continue to cost the taxpayers on the order of $1 billion a year.

The industry believes that the consolidation and storage of used nuclear fuel on a temporary basis at one or two interim sites can provide significant benefits in cost, system integration, synergy with recycling technology development, and confidence in the Federal waste management program.

We would urge the Congress to evaluate alternative interim storage proposals, not just the one that has been addressed so far this morning.

We would recommend the following principles: minimize the number of interim storage sites to one or two sites to reduce the cost and maximize the efficiencies of consolidation; provide host site benefits, as has been discussed; recognize that, while the nuclear waste fund could be used to pay for this interim storage, it should not be used to develop the complementary technologies for advanced reprocessing; and, finally, NRC must be provided with the necessary resources and appropriate management focus to accommodate these new proposals.

As utilities prepare to license and build new nuclear powerplants, it is essential that appropriate new contracts for disposal of spent nuclear fuel between these utilities and DOE be put in place to allow the NRC to adjudicate the combined operating license applications that we have disucssed. The previously issued EPA disposal standard of 10,000 years we believe was appropriately protective of public health and safety and was consistent with other hazardous material regulation in the United States. This standard was remanded by court finding on a pure technicality. Congress should legislate the appropriate 10,000-year standard.

Sir, I am ready for any of your questions.

Senator VOINOVICH. Thank you very much.

Mr. Gilinsky.

STATEMENT OF VICTOR GILINSKY, INDEPENDENT ENERGY CONSULTANT

Mr. GILINSKY. Thank you, Mr. Chairman. As you mentioned in your generous introduction, I have been an independent energy consultant. I should add to that that for the past few years I have been a consultant to the State of Nevada on Yucca Mountain issues.

I would like to address briefly three NRC-related items. The first is interim storage that you have heard so much about, the second is the NRC's waste confidence rule, and the third is the new Global Nuclear Energy Partnership, GNEP.

First, interim storage. Now, no matter what happens with Yucca Mountain, whether it goes forward or not, on schedule or not, we are going to need a lot of spent fuel storage. The generating companies are preparing themselves by building facilities at their sites to store spent fuel in dry casks. The technology is straightforward. The NRC has been licensing these facilities and they don't appear to strain the Agency very much.

It would be also good to have regional storage sites, I believe of the sort the admiral is speaking about. I think we are in agreement here. First, for overflow capacity, some of the utilities may be pinched for space, although most of them have adequate space at their sites. Second, to collect fuel from the shut-down reactors, the so-called orphans. There are about a dozen of these, or 10 or 12. And, third, eventually to collect all the spent fuel under dedicated storage management.

Senator Domenici's bill actually allows for such central facilities. The idea is a good one.

In the short run, for safety and security it would be a good idea to move the spent fuel from reactor pools into dry casks as soon as the fuel cools sufficiently. Senator Reid's bill addresses this point.

Now, all this would make sense even if you thought Yucca Mountain was on track, but experience tells us that it isn't. DOE's projected opening date has slipped 7 years since Congress voted on the Yucca Mountain resolution 4 years ago, and now we hear that projected date is an optimistic date, it is contingent on Congress passing certain legislation.

You probably know that last week the Secretary of the Interior vetoed the private fuel storage facility in Utah, in part because he concluded it was not prudent to rely on Yucca Mountain opening. I think that is pretty significant.

This leads directly to the second item, the NRC's waste confidence rule. Let me give you a little bit of a different view on that. The current version of the rule was adopted in 1990. It says the NRC is confident that a geologic repository will open in 2025. Now, in 1990, when the NRC adopted that rule, it said it was not prejudging the Yucca Mountain case because if Yucca Mountain did not work out there would still be time for another repository to be built. That was true then; it is no longer true today with the passage of time.

In effect, what the rule is saying is that the NRC is confident that Yucca Mountain will be licensed. In other words, the NRC is pre-judging the case. Nevada appealed to the NRC to remove that date and just say that they are confident that the spent fuel will be taken care of adequately. The Commission refused, even though this would also have benefitted its power reactor licensees, taken the pressure off them. In any event, Nevada appealed to the Federal court and the case is being argued even as we speak here today in the court of appeals. I suppose we will find out what the Federal courts think about it pretty soon.

Now, the bills before you would have Congress change the rule for the NRC. In my view, because such a change involves a safety judgment, and they are the stewards of nuclear safety, I believe it is more responsible that the NRC should do this, itself, through rule-making.

My third item concerns GNEP, the Administration's grand plan for developing technology to transform the distant future of nuclear power worldwide. It is not likely to demand much in the way of NRC resources for quite some time, I think. That may change, however, if DOE pursues its latest idea, which is to "fast track the GNEP demonstration plans." I think fast tracking carries a lot of risk here. It is a very chancy thing. I have to say it gives me pause that I can't think of a single instance—and perhaps I'm wrong—of DOE developing a major technology to full scale and then passing it successfully to industry. At this point, GNEP contains some concepts that might be useful if they worked, but they are a long way from being practicable.

I would say, as a final thought, at a minimum DOE should have to pass NRC safety licensing for any substantial demonstration facilities in this program. This is going to slow them down, but it will keep their feet on the ground.

Thank you.

Senator VOINOVICH. Thank you.

Mr. Bowman, I was very interested that, on behalf of the industry, you have said that these interim facilities are something that the industry is supportive of, but that you do not support 30 of these facilities. I would like you to comment on two things. One is, Mr. Gilinsky is suggesting that everything be moved into dry storage, and the cost to the industry of that and the ratepayers is one thing, but also you mentioned one or two facilities that would be built to handle this storage.

I guess the last thing is, is part of all of this trying to give confidence to the financial markets that the issue of storage is going to be dealt with in a responsible fashion? I know that several years ago when we had testimony before this committee one of the things that was raised about nuclear facilities was, you know, what are you going to do with the storage. That came from some folks in the bond market.

Can you kind of tie all this together and give me your perspective on it, industry's perspective?

Admiral BOWMAN. Yes, sir.

Mr. Chairman, I agree with Mr. Gilinsky that the storage of used fuel as we are doing it today at our existing reactor sites is perfectly technically safe. There is no impact on the public health and

safety and it is absolutely a safe thing for us to be doing. The problem is the need to maintain the support of the American people, which we enjoy today to the extent of some 60 to as high as 80 percent approval ratings.

You can't get 80 percent of Americans to say they like vanilla ice cream, but we have 80 percent of Americans in some polls saying that nuclear energy simply must be a part of the future energy mix in this country. To retain that public confidence we believe that we need to show that the Government intends to honor its statutory obligation to take title to and move this nuclear fuel out of the individual States into a centralized facility.

While I am encouraged by Mr. Sproat's 2017 optimistic deadline for opening Yucca Mountain, I believe that we should have a parallel path as a Plan B, if you want to call it that, to accommodate used fuel more quickly, if 2017 doesn't work out for us. We need to show the American people that the Congress fully supports this industry, as you have done over the past many years now, including in the Energy Policy Act, through enactment of legislation that addresses interim storage on a small scale—one, two, three interim storage sites—and also to address the waste confidence issue.

I would disagree with Mr. Gilinsky on one point. I believe that the waste confidence issue is not an issue under the purview of the Nuclear Regulatory Commission because it is not a technical question; it is a public policy question and Congress, the elected officials of the American people, is the body that determines public policy.

The issue of waste competence arose because one of the many interveners along the way challenged the issuance of a license that NRC had given to a utility on the basis that that utility had not included in its environmental impact statement the retention of used fuel at that site for the lifetime of the plant. The Nuclear Regulatory Commission explained to the court that that wasn't necessary to include in the EIS, because there would be this centralized repository.

Since then, to avoid reopening that question of must an EIS address lifetime storage, the Nuclear Regulatory Commission has relied on the promises of Congress and the statutory obligations of enacted legislation to say with confidence, to use that word, that there is a long-term storage program for this country that avoids having to have the environmental impact statements address keeping that fuel at the sites forever and ever. So, in my view, waste confidence is a matter before the Congress and not a matter before the Nuclear Regulatory Commission.

Senator VOINOVICH. Thank you.

Senator CARPER. Thank you, Mr. Chairman.

Gentlemen, welcome. It is good to see both of you. Thank you for your testimony and responding to our questions.

I would just ask Mr. Gilinsky, first of all, just briefly, where do you think you and Admiral Bowman agree?

Mr. GILINSKY. Well, it sounds like we agree that there ought to be a Plan B on addressing what is generally called interim storage.

Senator CARPER. Anywhere else, at least on the issues before us today?

Mr. GILINSKY. I just shook hands with him, but on the basis of the testimony I think really that is the essential point, that there ought to be a parallel approach to surface storage.

Senator CARPER. Admiral, where do you think you agree?

Admiral BOWMAN. Sir, if I could dissect Mr. Gilinsky's testimony, I agree with virtually everything he said. I disagreed with the issue of waste confidence, as I just explained. I do think that is a matter before the Congress.

Second, Mr. Chairman, I forgot to address your third point, from your earlier question, and that is the issue of why it is necessary to move fuel from safe storage and spent fuel pools, which has been the original intent from the beginning of these plans, into dry storage. You asked about the cost. I don't have a good figure. I will certainly supply that for the record, but I will tell you that it is very expensive to do that.

[The referenced document follows on page 71.]

Admiral BOWMAN. Now, an argument against requiring moving from the spent fuel pools to dry storage, the other issue that I would take with Mr. Gilinsky's testimony is that it is perfectly safe in the spent fuel pools. Scenarios that hypothesized various terrorist actions, various accidents that could occur in the spent fuel were analyzed by the National Academy of Science, with recommendations for the Nuclear Regulatory Commission to implement certain requirements, certain regulations having to do with shifting fuel around inside the pools, delaying putting the fuel into the pool until it cools, and those kinds of things. All those actions have been completed at all 103 nuclear powerplants in operation in this country.

So in my view it would be an unnecessary expense, it would require us to handle this used fuel an additional time, and I think it is unnecessary. That is the second place I would disagree. But other than that, I agree with Mr. Gilinsky. We only met, so it is hard to say where all we agree, but certainly I agree with everything else that he said.

Mr. GILINSKY. Senator, if I could just add a word, I was trying to retain an air of agreement, but if you are looking for shades of disagreement or difference, the Admiral mentioned the National Academy of Science report. Indeed, the fuel is safe at the sites where it is, but as the National Academy of Science report says, it is inherently safer and more secure in dry casks, so it is a better answer. You should not be loading up these fuel pools excessively because they do rely on active safety systems. In the dry casks it is basically a passive system. It is highly protected. It is not in water. I think it is just a better and safer and more secure approach, and we ought to shift the fuel as soon as we can into that form, spent fuel.

Senator CARPER. I don't know if it was you, Admiral Bowman, or another witness who talked about the number of interim storage facilities we might have, but how do we incentivize State or local communities or tribes to use their tribal lands to be willing to receive those materials for an interim period of time, which I agree could be more than just a couple years? Mr. Gilinsky, I'm going to ask you to answer that as well, please.

Admiral BOWMAN. Senator Carper, that is a wonderful question, and it also gives me the opportunity to suggest that the industry believes that these one, two, or three interim storage sites, these small number of interim storage sites should be linked to this advanced technology proposal that underpins the GNEP concept.

Yesterday I heard Assistant Secretary of Energy Dennis Spurgeon state that, in response to the Department of Energy's request for expressions of interest, that he had received 14 submittals from various localities around the country on a voluntary basis that they were, indeed, interested in the concept of developing this advanced reprocessing technology, and with it taking on the interim storage that would be a part of that project. So the kinds of incentives that we are talking about are those that the Department of Energy is already proposing and that apparently appeals to a large number of localities around our country.

Senator CARPER. Good. Thanks.

Mr. Gilinsky.

Mr. GILINSKY. Well, when we talk about siting waste facilities, that gets into a lot of complex issues, local issues, political issues, but I would say this for a surface facility: the technical issues are much simpler than for a geologic facility, where there are a lot of uncertainties. In fact, I actually like the idea of monitored surface storage, because if there are problems you can fix them. The problems with deep underground disposal is that you have to be very sure, because once you've closed it up all errors are irretrievable, and that is what leads to all the hand-wringing.

There's another aspect of this, which simply lies behind people's concern and resistance, it is just that they don't have confidence in the Government. I think one has to think about perhaps different institutional arrangements than we have had in the past. They don't have confidence in the agencies that have worked this problem in the past.

Senator CARPER. All right. Thanks.

Mr. Chairman, sort of a sidebar here with you, going back to when you all were trying to figure out where to put the low-level radioactive waste in Ohio and we were trying to figure out where to do it in the Delaware Valley, it always seemed to me that if you, in a broader sense, with respect to high-level nuclear waste, if you say to a community that we are going to cut your utility bills in half or your electric bill in half or we are going to provide rebates on your property taxes for those of you that are within a certain proximity to this kind of facility, there are ways that—I don't know if you can make an offer to folks that they can't refuse, but there are ways that you can make this pretty attractive to folks aside from just the investment and the kind of jobs that are created here.

I would hope that if we are to go down, continue to pursue Yucca, try to identify places to put these interim storage units, that we are going to couple that with this GNEP and also continue to maintain storage on site, we need to be smart enough to find ways to incentivize communities so that not necessarily they will stand in line like these 18 or so that have expressed an interest, but there will be a—when the community leader stands up and says this could be good for our community, they won't have their heads handed to them.

Senator VOINOVICH. Well, I would like to be as optimistic about this as Mr. Bowman is, but I think that, even with low-level storage facility, the controversy that is involved is a question of the geography and terrain and the rest of it, and the NIMBY problem.

I think that two or three of these perhaps maybe makes sense. To go to 30 of them I think is a problem. You know, Mr. Bowman, you never did answer the question about the financing of these facilities. You just talked about the applications for so many and so on, but is this waste confidence thing going to impact on the ability for these folks that want to build these to get the money they need to do it? I mean, they have to borrow the money from somebody. Is that an issue today do you think on Wall Street, waste confidence, or not? That is a surprise to me, because before it seemed to be a big deal, and now all of the sudden—maybe it is the energy bill and the incentives that we put in for the first six of them, I think, but why has that changed, and how much of what we are doing here is kind of giving them the confidence that if Yucca doesn't happen we are going to be doing something else?

Admiral BOWMAN. Yes, sir. You are right, when I addressed the question, I didn't get back to the Wall Street side. I spoke of the public confidence that would come with sure knowledge that the U.S. Congress is behind this and that U.S. Congress intends to ensure that proper used fuel stewardship is in place. It is the public confidence that I think would spill over to Wall Street.

With the Wall Street analysts, Mr. Chairman, much more important and much higher on their minds is the provision in the Energy Policy Act from last year that provides for Government-backed guaranteed loans for these projects. I would point out that it is not just nuclear that was given that guaranteed loan provision opportunity, it is all clean energy. So in this regard nuclear was lumped with solar, wind and geothermal to ensure that project cost and financing could be done on a basis that was favorable to the industry, most importantly, favorable to the consumer and saving our ratepayers enormous sums of money. With guaranteed Government loans we could highly leverage these plants so that the financing would take the form of, for instance, 80/20, percent.

Senator VOINOVICH. It is my understanding that this loan guarantee is going to apply to all of these? I thought it was just going to be——

Admiral BOWMAN. It is to all, yes, sir.

Senator VOINOVICH. All of them?

Admiral BOWMAN. Yes, sir. Now, the industry is paying for this. The industry pays for the premium for this loan backing based on an OMB formula that goes to the probability of failure and the amount that is being indemnified on each project, so this is not a subsidy. The is something that the industry——

Senator VOINOVICH. It will reduce the projected cost? I've got to be more familiar with the financing. The industry is the backup on it? In other words, if one of these goes belly-up, the Feds are there, but the industry is backing them up? It is like a re-insurance?

Admiral BOWMAN. If one of these went belly-up, the Federal Government would take custody of the plant and the facilities and they would be the Federal Government's. The loan guarantee is that the Federal Government is backing the industry. But like insurance

work, the industry would pay a premium for the right for the Government to do this. It is just like the Export/Import Bank loans that are traditional. It is like that, sir, and it would apply for all these new plants—solar, wind, nuclear—without limitation. The six-plant limitation applies to the other two provisions in the Energy Policy Act, the production tax credit and the so-called risk insurance. That is a different kind of risk. That is the risk of regulatory failure.

Mr. GILINSKY. Actually, Senator, most of those plants are coming from the Southeast where they are regulated, and the loan guarantees aren't as important as the credits. The loan guarantees are important for the unregulated plants.

Senator VOINOVICH. Mr. Bowman, you have heard the testimony of Mr. Reyes about the status of the hiring of people over at the NRC, and you speak, I'm sure, with folks that are involved with the NRC. I would like your appraisal of how accurate he was in terms of bringing on the personnel that they need to get the job done, and then also comment on the additional people that Mr. Reyes said that they would need to do the siting of these facilities that you think we need to have, and, last but not least, this GNEP thing and what impact would that have on them at a time when we want to get those COLs moved down the street as quickly as possible.

Admiral BOWMAN. Sir, as I recall Mr. Reyes' testimony, he said that the goal at the NRC was to net 200 personnel per year for the next 3 years, and I know that they have set that as a goal and last year they met that goal. I am happy to report that across the country progress is being made. You and I have had private conversations about this. As you know, I sit on three visiting committees at universities as an effort to encourage——

Senator VOINOVICH. Yes, thank you very much for your lobbying to make sure they maintain their programs.

Admiral BOWMAN. Yes, sir. The good news is many of those university programs now are filled to overflowing, whereas 2 years ago, when you and I first talked about this we were somewhat worried that it wasn't going to happen that way. I am happy that you helped us turn around the University of Cincinnati. I don't know where that logic came from to do away with their program, but I think that is back on track now and they don't intend to do away with their nuclear engineering program.

But I think the NRC's goal is proper. I think they have looked carefully at the assets required. They are challenging industry to be sure that we know what we are talking about when we say 19 applications for 30 plants because, they are going out and hiring to those kinds of numbers to ensure that they do have the assets in place. I applaud that effort and I am doing everything in my power to help universities encourage young people to go into the sciences and engineering that would help both industry and the Nuclear Regulatory Commission.

Senator VOINOVICH. Well, the question is so you think they are doing okay, but what about the impact that this would have?

Admiral BOWMAN. Well, the technologies underlying the GNEP proposals, would obviously put an additional strain on the Nuclear Regulatory Commission. You asked the right questions. To my

knowledge, from my Naval reactor days and being a co-regulatory with the Nuclear Regulatory Commission for the other 103 nuclear powerplants in this country—they are the ones that are underwater and moving our aircraft carriers around—I don't think that the NRC has in-house today the talent, the ability to adjudicate fast reactor technology. I don't think that they necessarily have in house today people ready to step up and begin looking at licensing and advanced reprocessing. So surely it would put a strain in addition to the strain that they are already going to feel with this resurgence of new nuclear on the Nuclear Regulatory Commission.

I can't speak directly to the numbers with any authority because I haven't looked at it.

Senator VOINOVICH. The GNEP $13 billion, if I heard you correctly, you indicated that you thought that the spent fuel fund could be used for that but that the technology cost of that should not be?

Admiral BOWMAN. Sir, what I should have said was that I believe that the law allows and that it would be prudent and proper that, if we had these two or three interim storage sites, the cost of developing those interim storage sites, which we heard in testimony in a different committee yesterday on the order of $15 million per site. I think that the cost for developing——

Senator VOINOVICH. That was $15 million?

Admiral BOWMAN. Per site. It is nothing more than a concrete pad. This is not a rocket science kind of project that would have to be developed. Now, there's a little bit more to it than that. But $15 million was the approximation that Mr. Sproat, in fact, provided yesterday, for the construction aspects. I think we heard Mr. Reyes say that he's looking at about $10 million per project.

So the industry's position is the cost for developing, for licensing these interim storage sites could be borne by the Nuclear Waste Fund, but the cost for developing the complementary technologies for GNEP, should in no way, shape, form, or fashion be taken from the Nuclear Waste Fund. That is not what it was intended to do, whereas interim storage is a piece of what it was intended by the original Nuclear Waste Fund.

Senator VOINOVICH. The GNEP, isn't that being done someplace else? Aren't they doing that in Europe today? Where is the technology on that?

Admiral BOWMAN. Sir, this gets somewhat complicated. I will go quickly. In France, in Russia, in Japan, in the United Kingdom reprocessing is taking place today, but it is the type of reprocessing that this country walked away from years and years ago because it is the type of reprocessing that produces as an end product a pure stream of plutonium, and for proliferation concerns the United States decided to stop that type of reprocessing, and we've stuck to that for these years.

The type of reprocessing that is envisioned in the long term that would underlie or undergird the Global Nuclear Energy Partnership idea would be a new kind of reprocessing. The type I just described is called PUREX. This advanced reprocessing is called UREX. It would not generate a pure stream of plutonium as an end product. In fact, it would bind the plutonium to some of the nasty stuff that is a part of the spent fuel that would make it more or

less proliferation proof. It would not be something that you and I would want to walk in and put in the back of our cars and drive off with, for sure. Advanced reprocessing has been proven at a laboratory scale, petri dishes, small gram amounts of reprocessed capability, but it has not been proven at a commercial scale. That is the billions and billions of dollars of R&D and the long-term, long-time investment that would be required for this country to go in that direction.

Now, that said, despite the billions and despite the years that it might take, the industry believes that that is the proper thing to do for the proper stewardship of this used fuel. Advanced reprocessing, not the type that France, England, Japan and Russia are doing today, would in the final analysis, reduce dramatically the radiotoxicity and the volume requirements for repositories and that amount of used product that has to go into the earth.

Senator VOINOVICH. So if the Department of Energy is looking at this issue—again, from the testimony, if you are looking for these temporary storage facilities, that someone could be also looking at it in terms of this GNEP thing? In other words, where would be a good place to do the GNEP and do that interim storage, but the GNEP would follow later on in terms of——

Admiral BOWMAN. Exactly.

Senator VOINOVICH. Yes.

Admiral BOWMAN. Sir, I think the word option comes into play here, and it is to Mr. Gilinsky's point. If we ever do, get to the point that we put this used fuel into a repository like Yucca Mountain and close the door and lock it and walk away, that would be wrong for all the reasons Mr. Gilinsky said, because if something did go wrong then we wouldn't have the opportunity to re-enter and make it right, but that is not what is planned, either at Yucca Mountain or these interim storage sites. They would certainly give us the opportunity, as Mr. Gilinsky said, to monitor on a daily basis what's going on, to allow the fuel to be cooling down, reducing repository requirements. It has a whole lot of attendant good to it.

Back to the Yucca Mountain project. The original Nuclear Waste Policy Act in 1982 required by law an unspecified period of monitoring and retrievability for this repository. To accommodate that requirement, that law, the final environmental impact statement at the Department of Energy includes a period of monitoring and retrievability of 50 to 300 years. It is also embodied in NRC regulation that at least 50 years of monitoring be available after the fuel is in the Yucca Mountain repository.

In my testimony today I encouraged that we look at extending that period even beyond 300 years. I think that Mr. Gilinsky is exactly right: there is no reason to finally close the door. I think my grandkids are going to be smart enough to make their own decisions based on advances in technology to decide whether it is economically feasible and proper for the stewardship of this used fuel to pull it back out and reprocess it, as an example.

So the industry supports as much flexibility and as much future option for future generations as we can build and design into this facility.

Senator VOINOVICH. It is the commercial stuff from the dry casks and waste pools that would go out there, and you made it clear

that the military will use up a good bit of this, so we are talking about increasing the tonnage out there, correct?

Admiral BOWMAN. Yes, sir.

Senator VOINOVICH. The other thing that was brought up is the issue of expanding the site so that things that are not consistent with it wouldn't be built. That question came up. I wondered, would the money from the fund be used to purchase that property? Wouldn't we have the same problem? Mr. Gilinsky, you spent some time out in Nevada. How well would that be received?

Mr. GILINSKY. Well, it wouldn't be well received at all because the site is a poor one, basically. But the people that are talking about expanding are talking about using the same area but just putting more fuel in there.

I wonder if I could add a word about GNEP, just one point?

Senator VOINOVICH. Sure.

Mr. GILINSKY. GNEP has lots of moving parts and I don't think we have time to really go through all this, but it is said over and over again that it reduces the waste, and it does in a certain respect in that it burns up the plutonium, or would if the whole thing worked, but one thing which is not advertised, the way you get GNEP to reduce the amount of material that goes into a disposal facility is that you leave the hottest, most radioactive isotopes on the surface. I mean, that is part of the GNEP plan. Cesium and strontium, which are the hottest initially, the isotopes you worry about the most, they are not going to put those in a repository at all because if you put them in there then you've got the heat load, you are not reducing the heat load, and therefore you are not reducing the amount of repository space that you need.

If you are willing to leave the hottest stuff on the surface, it is kind of unclear why you are going through this entire exercise. Why not just leave the spent fuel on the surface?

Senator VOINOVICH. Mr. Bowman, do you have anything on that?

Admiral BOWMAN. Sir, I am not here to defend GNEP necessarily but, for the record, the DOE's vision and, frankly, the Administration's vision of GNEP is not exactly as described. The advanced reprocessing would not only remove the plutonium, which Mr. Gilinsky said correctly would be burned in a fast reactor. Remember I said that the plutonium would be bound to this other stuff, and that other stuff is called actinides. Actinides are the real driver for the size of the repository after about 80, 100 years. The heat load from the fission products such as cesium and strontium that Mr. Gilinsky spoke of carry the day and drive the size of the repository for the first 80 years, but then these long, long, long-lived, long activity, hot actinides are the driver for the size of the repository out to the hundreds of thousands of years.

The idea in the GNEP program would be to develop the technology which doesn't exist on a commercial scale today to pull that actinide out and burn it also, fission it, and extract energy from it in a fast reactor. By doing so you get energy and you get rid of that long-lived stuff, you reduce the radiotoxicity and the volume requirements of the repository. That is more what is envisioned for the long-term efforts of this Global Nuclear Energy Partnership.

Mr. GILINSKY. I agree with that, but the fact is they are planning to leave the fission products, the hottest fission products on the

surface, and those are the ones that for the first 80 or so years are, in fact, the hottest isotopes.

Senator VOINOVICH. Well, we will probably be talking about it some more.

Mr. GILINSKY. Right.

Senator VOINOVICH. I want to thank you both very much for being here today. The record will be held open for questions. Thanks very much.

Mr. GILINSKY. Thanks very much, Mr. Chairman.

Senator VOINOVICH. The meeting is adjourned.

[Whereupon, at 11:30 a.m., the subcommittee was adjourned.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Mr. Chairman, thank you for holding this hearing on the Nuclear Regulatory Commission's capabilities and responsibilities for short- and long-term storage of spent nuclear fuel.

Nearly 52 percent of my State's electricity comes from nuclear power. Across the Nation, 20 percent of our electricity is from nuclear powerplants. As we seek ways to use less foreign oil and do more to protect our environment, nuclear power may become more central to our energy portfolio.

But when making decisions about nuclear power, we must always put the health and safety of our citizens first. That is why the question of disposal of nuclear waste is so difficult. Since 1984, our long-term option has been Yucca Mountain in Nevada. But with questions about health standards, falsified data, and the safety of transporting waste from all over the country, its completion date drifts further into the future every day.

Senator Domenici has offered an alternative plan: to create interim storage sites in States with nuclear reactors or at regional facilities for up to 25 years. While I appreciate the search for a solution, I'm concerned about this approach, too. Under the Domenici plan, the Department of Energy would have the authority to override State law. A State's Governor could recommend the best site and the Department of Energy could just say "no."

There is also the question of the safety of transporting nuclear waste to interim sites in dozens of States. It is risky enough to have to move nuclear waste once. To move from these short-term sites to a long-term one, we'd need to move it twice.

I look forward to hearing from today's witnesses on all of these challenges. Thank you Mr. Chairman.

STATEMENT OF HON. HARRY REID, U.S. SENATOR FROM THE STATE OF NEVADA

I want to thank the Chair, the Ranking Member and other members of the committee and subcommittee for the opportunity to present testimony on the issue of spent nuclear fuel storage and security. This issue is important to the national security of all Americans.

I am pleased that the committee is discussing different options for spent nuclear fuel storage. Years of problems with the proposed Yucca Mountain repository—from new scientific data demonstrating geological and environmental problems with the site to scientific and technical missteps and misrepresentations that have been ignored by Department of Energy (DOE) management for decades—have led many to conclude that Yucca Mountain is unable to meet basic public health, scientific and safety requirements and, thus, is an inappropriate site for the long-term storage of spent nuclear fuel.

Even the Administration knows that Yucca Mountain is a flawed, dangerous project. This is reflected in the Administration's bill, which tells us everything the Administration knows is wrong with Yucca Mountain. They have sent us this legislation to change the rules, break the law and prevent States from protecting their citizens.

If Yucca Mountain were scientifically sound—if it genuinely was a safe place to store nuclear waste—the Administration would not need to gut the laws that regulate hazardous waste handling and transportation, clean air, water rights, public

land laws, and environmental policy. If Yucca Mountain were scientifically sound, the Administration would not need to preempt States' rights.

If Yucca Mountain were scientifically sound—if it was genuinely safe—we would not have the Administration's bill and we would not be discussing it today.

Let us be honest. The Administration is trying to prevent the States from protecting themselves and their citizens. It is important to remember that this proposal does not just affect or preempt Nevada, but your States as well.

What may be even worse is that Congress is being asked to approve the gutting of all these laws and authorities for a project without any details, with no assurance of its safety, no assurance of its viability, and no assurance of its long-term integrity.

We cannot sacrifice our Nation's national security for this short-sighted proposal. It is time for us to stop wasting time and money researching, redesigning and rescheduling Yucca Mountain. After more than 20 years we know that it will not work. It is time for us to look at other alternatives for securing our spent nuclear fuel while we search for a safe and scientific long-term solution.

Many, including some of my esteemed colleagues on this panel, see nuclear power to be a solution to many of our energy problems. But for nuclear power to solve these problems, we must scientifically address its challenges—spent nuclear fuel storage and transportation, the security and siting of nuclear facilities, and nonproliferation. I would like to see these problems solved.

But that will never happen until we actually look for and find a scientific solution, not a political solution, to these challenges. America has the best minds in the world. I believe that if we truly focused on solving the problems of spent nuclear fuel, we could.

How are we to secure the waste in the interim? We leave it on-site in dry cask storage, where it is safely and securely stored now and where the experts and the nuclear industry have demonstrated that it will continue to be safely stored for decades.

That is exactly what The Spent Nuclear Fuel On-Site Storage Security Act of 2005, S. 2099, which I introduced last year with Senators Ensign, Bennett and Hatch, does. This bill is a road map and a timeline for safely securing our spent nuclear fuel for 1 to 200 years, giving us time to find a safe, scientific long-term solution to this national security issue.

A 1979 study by Sandia National Laboratory determined that, if all the water were to drain from a spent fuel pool, dense-packed spent fuel would likely heat up to the point where it would burst and then catch fire, releasing massive quantities of volatile radioactive fission products into the air. Both the short-term and the long-term contamination impacts of such an event could be significantly worse than those from Chernobyl. The report concluded that the consequences would be so severe and would affect such a large area that all precautions must be taken to preclude them. This is the type of serious, avoidable risk against which all the Nation's nuclear sites can and should be protected to counter terrorist threats.

On March 28, 2005, the Washington Post revealed that a classified National Academy of Sciences (NAS) report concluded that the Government does not fully understand the risks a terrorist attack could pose to spent nuclear fuel pools and that it ought to expedite the removal of the fuel to dry storage casks that are more resilient to attack. The public version of this same report found that fuel in spent fuel ponds is an attractive terrorist target and that there are inherent benefits to placing the fuel in secure, dry casks.

The technology for long-term storage of spent nuclear fuel in dry storage casks has improved dramatically in the past 20 years. Fourteen cask designs have been licensed by the Nuclear Regulatory Commission, which says that spent nuclear fuel can be safely stored using dry cask storage on-site at nuclear powerplants for 1 to 200 years. Already, dry casks safely store spent nuclear fuel at 57, more than 50 percent of sites throughout the country, many of them near communities, water ways and transportation routes. The Nuclear Regulatory Commission has received applications for dry cask storage at 15 additional sites. The Nuclear Energy Institute projects that 83 of the 104 active reactors will have dry storage by 2050, which seems like a conservative estimate based on current numbers, but acknowledges the safety and inevitability of on-site, dry cask storage.

Compared to water-filled pools, dry storage casks are significantly less vulnerable to natural and human-induced disasters, including floods, tornadoes, temperature extremes, sabotage, and missile attacks. In addition, dry storage casks are not subject to drainage risks, whether intentional or accidental.

In addition, on-site storage saves money. DOE's last estimate for Yucca Mountain, a low ball estimate, was $56 billion. Nevada estimates $100 billion. Dry cask storage at all sites is estimated to cost, at the low end, $4.5 billion, up to $10.5 billion, tops.

It's important to remember that 54 of those sites are already built, so future costs are really $2.25 to $5.25 billion.

My bill requires commercial nuclear utilities to safely transfer spent nuclear fuel from temporary storage in water-filled pools to secure storage in licensed, on-site dry cask storage facilities. After transferal, the Secretary of Energy will take title and full responsibility for the possession, stewardship, maintenance, and monitoring of all spent fuel thus safely stored. Finally, our bill establishes a grant program to compensate utilities for expenses associated with transferring and securing the waste.

These costs will be offset by withdrawals from the utility-funded Nuclear Waste Fund. Currently, utilities are suing for reimbursement for these costs, and winning, from a Department of Justice compensation fund. The only fiscally prudent path is to pay for spent nuclear fuel storage with the funds raised to pay for it.

Nuclear facilities currently provide 20 percent of our Nation's electricity, but in light of the events of September 11, they also present a security risk that we simply must address. There cannot be any weak links in the chain of security of our Nation's nuclear power infrastructure. There is absolutely no justification for endangering the public by densely packing nuclear waste in vulnerable spent fuel pools when it can be stored safely and securely in dry casks. My bill guarantees all Americans that our Nation's nuclear waste will be stored in the safest way possible.

It should be clear to anyone that the proposed Yucca Mountain project is scientifically unsound and that it cannot meet the requirements of law. It is not going anywhere. Delay after delay costs the taxpayers billions and billions of dollars for a project that the courts have ruled does not meet sufficient safety or public health standards. I do not believe that Yucca Mountain will ever open, and Nevada and the country will be safer for our successful efforts to stop the project.

But we cannot ignore the fact that nuclear power produces spent nuclear fuel and must vigorously research ways in which to decrease the toxicity, longevity and volume of these wastes. Until we have developed safe, scientific ways to do this, we must securely store our waste. The experts agree that the safest solution is to remove the fuel from the spent fuel ponds and to store it on-site in dry cask storage.

I urge my colleagues to support The Spent Fuel On-site Storage and Security Act of 2006, S. 2099. It's the right solution for the American people.

CONEG
COALITION OF NORTHEASTERN GOVERNORS

Governor Donald L. Carcieri, Cha
Anne D. Stubbs, Executive Direct

August 2, 2006

The Honorable Harry Reid
Ranking Member
Subcommittee on Energy and Water, and Related Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510-6030

Dear Senator Reid:

The Coalition of Northeastern Governors (CONEG) recognizes the difficult challenges posed by the complex policy and technical issues surrounding permanent, safe and secure disposal of nuclear waste. Yet, we are deeply concerned and must strongly oppose language in the Senate Energy and Water Development Appropriations bill (H.R. 5427) that would suddenly shift long-established national policy on nuclear waste disposal by requiring commercial spent fuel to be stored at local or regional federal consolidated storage facilities in up to 31 states across the nation (Section 313).

We are concerned as well about the hasty timetable of the proposal. It is not adequate to evaluate fully the safety, security, environmental, transportation and infrastructure challenges associated with developing and maintaining multiple consolidated federal nuclear waste storage sites scattered across the country.

At the direction of the Congress, the federal government has a long-standing policy and contractual commitment with the nation's utilities and with their ratepayers to assume responsibility for high level nuclear waste and to develop a nuclear waste repository. Electricity ratepayers in our states and across the nation have upheld their part of the commitment by paying billions of dollars into the Nuclear Waste Fund for development of a permanent long term centralized facility. However, the Senate language in Section 313 undermines the federal commitment by diverting these much needed funds away from the intended purpose of creating a safe and adequately designed permanent nuclear waste repository and directs them toward a hastily created network of federal consolidated storage facilities. This action could delay development of a safe, secure, and environmentally preferable repository for high level nuclear waste. Such a facility is needed to meet contractual commitments, and will be needed even if advances are made in future reprocessing of appropriate nuclear waste.

It is vital that progress continue toward a permanent solution to the management of commercial spent nuclear fuel. Creating federal consolidated nuclear waste sites in locations that would never be chosen for such purpose in a site selection process – while further delaying the creation of a nuclear waste repository – is unacceptable. We urge the Senate to honor its existing commitment to ratepayers, states, and the nation's nuclear waste disposal program by rejecting the provisions contained in Section 313 of the FY 2007 Energy and Water Development appropriations bill.

Sincerely,

Donald L. Carcieri
Chairman
Governor of Rhode Island

James H. Douglas
Lead Governor for Energy
Governor of Vermont

cc: Senator Bingaman

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CONEG
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Governor Donald L. Carcieri, Cha
Anne D. Stubbs, Executive Direct

August 2, 2006

The Honorable Pete Domenici
Chairman
Subcommittee on Energy and Water, and Related Agencies
Committee on Appropriations
United States Senate
Washington, DC 20510-6030

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Sincerely,

Donald L. Carcieri
Chairman
Governor of Rhode Island

James H. Douglas
Lead Governor for Energy
Governor of Vermont

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California Attorney General Bill Lockyer
Connecticut Attorney General Richard Blumenthal
Illinois Attorney General Lisa Madigan
Maine Attorney General G. Steven Rowe
Minnesota Attorney General Mike Hatch
New Hampshire Attorney General Kelly A. Ayotte
New Jersey Acting Attorney General Anne Milgram
New York Attorney General Eliot Spitzer
Vermont Attorney General William H. Sorrell
Wisconsin Attorney General Peggy A. Lautenschlager

September 7, 2006

The Honorable Pete Domenici
Chairman
Subcommittee on Energy and Water, and Related Agencies
Committee on Appropriations
328 Hart Office Building
Washington, DC 20510

The Honorable Harry Reid
Ranking Minority Member
Subcommittee on Energy and Water, and Related Agencies
Committee on Appropriations
528 Hart Senate Office Building
Washington, DC 20510

Dear Senators Domenici and Reid:

The Attorneys General of Illinois, California, Connecticut, Maine, Minnesota, New Hampshire, New Jersey, New York, Vermont, and Wisconsin are deeply concerned by the proposal for interim storage of nuclear waste contained in H.R. 5427, the FY 2007 Energy and Water Appropriations bill. We are mindful of the complex problems and delay that have dogged efforts to establish a permanent repository for the nation's nuclear waste. However, we do not believe the appropriate solution lies giving DOE fast-tracked and unchecked power to designate nuclear waste storage sites over states' objections.

We are particularly troubled by the following aspects of the Consolidation and Preparation proposal embodied in H.R. 5427:

- *DOE authority would override state and local siting law.* The proposal is silent concerning the role of state and local laws governing siting and licensing of the storage facilities, and hence could well be interpreted to

override all such laws. DOE is being given the authority to ignore not only governors' recommendations and objections concerning the siting of a state or regional facility, but potentially any siting criteria and permitting restrictions that state and local governments would otherwise apply. DOE could assert the right to require virtually any parcel in a state offered by a willing seller to be used as a nuclear waste storage facility even if zoning laws, environmental laws (e.g., state endangered species or wetlands programs), or environmental justice siting provisions otherwise precluded such use.

- *Hasty timetable precludes proper analysis.* The proposal provides DOE only 9 months to choose sites for the storage facilities, and a total of only 3.5 years for licensing of the facilities. This is simply not enough time to fully and carefully evaluate the significant and complex safety, environmental, and transportation issues that would attend a massive effort to relocate the large amount of radioactive waste currently being stored at nuclear facilities across the country.

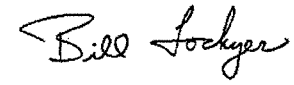
- *Dangers associated with transportation remain unaddressed.* In a February 2006 report, the National Academy of Sciences identified a number of issues that must be further studied before large-scale shipments of radioactive waste commence. These include security from terrorist threats, crash-testing of packages under severe accident conditions, and the likelihood and impact of long-duration fires. The proposal would, given its truncated time frame, effectively require that shipments commence before any of these issues are sufficiently evaluated. The proposal does not contain even basic measures to address the major transportation safety issues entailed in moving nuclear waste, such as emergency response preparation, accident prevention, security, and public education.

- *NEPA review is improperly limited.* The proposal prohibits consideration in the environmental impact statement of any impact of waste storage beyond the 25-year license period. Given the delays that have attended construction of the proposed permanent repository at Yucca Mountain, we believe this limitation is unacceptable, and poses significant long-term risks to any host state. A thoroughgoing environmental analysis should take into consideration the possibility that no permanent repository will have been designated at the time the licenses expire that is capable of handling all of the nation's nuclear waste – which will greatly exceed the capacity of Yucca Mountain in 25 years. As an overall matter, the NEPA provisions in the proposal are so lacking in clarity that they might well be interpreted to eliminate meaningful NEPA review entirely. For instance, while subsection (f) states that licensure shall be considered a major federal action requiring NEPA review, subsection (g) states that "the construction and use of a

facility licensed by the Commission" shall be considered preliminary decisional activity *not* subject to NEPA review. Also, it is at best unclear whether the NEPA process would allow for consideration of alternative sites, a critical component of any NEPA evaluation.

Overall, we are greatly concerned that the proposal is being advanced through the appropriations process, thus precluding any formal opportunity for state input regarding it. No hearings were held or comment opportunity provided prior to markup. A matter as important, complex, and inherently controversial as storage of the nation's nuclear waste deserves a full and open public debate, allowing states, interested stakeholders and the public to voice their concerns. We urge you to reject the provisions contained in Section 313 of H.R. 5427 and refer the matter to the appropriate authorizing committee.

Very truly yours,



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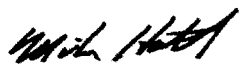
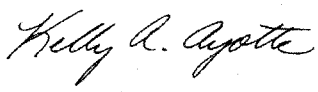
RICHARD BLUMENTHAL
Attorney General of Connecticut

LISA MADIGAN
Attorney General of Illinois

G. STEVEN ROWE
Attorney General of Maine



MIKE HATCH
Attorney General of Minnesota



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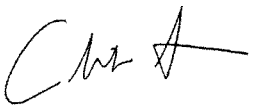

ELIOT SPITZER
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WILLIAM H. SORRELL
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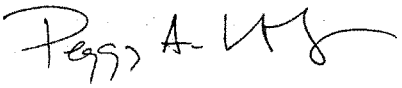

PEGGY A. LAUTENSCHLAGER
Attorney General of Wisconsin

cc: Attached list

cc:

The Honorable Max Baucus
The Honorable Melissa Bean
The Honorable Robert Bennett
The Honorable Marion Berry
The Honorable Judy Biggert
The Honorable Christopher S. Bond
The Honorable Barbara Boxer
The Honorable Conrad Burns
The Honorable Robert Byrd
The Honorable Tom Carper
The Honorable Lincoln Chafee
The Honorable Hillary Rodham Clinton
The Honorable James E. Clyburn
The Honorable Thad Cochran
The Honorable Jerry F. Costello
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The Honorable Jo Ann Emerson
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The Honorable Dianne Feinstein
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The Honorable Luis Gutierrez
The Honorable J. Dennis Hastert
The Honorable Dave Hobson
The Honorable Henry Hyde
The Honorable James M. Inhofe
The Honorable John Isakson
The Honorable Jesse L. Jackson, Jr.
The Honorable Jim Jeffords
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The Honorable Daniel Lipinski
The Honorable Donald Manzullo
The Honorable Mitch McConnell
The Honorable Lisa Murkowski
The Honorable Patty Murray
The Honorable Barack H. Obama
The Honorable Ed Pastor
The Honorable Dennis R. Rehberg
The Honorable Bobby L. Rush
The Honorable Jan Schakowsky
The Honorable John Shimkus
The Honorable Michael K. Simpson
The Honorable Ted Stevens
The Honorable John Thune
The Honorable Peter J. Visclosky
The Honorable David Vitter
The Honorable George V. Voinovich
The Honorable Zach Wamp
The Honorable John Warner
The Honorable Jerry Weller

STATEMENT OF EDWARD F. SPROAT III, DIRECTOR FOR THE OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT, U.S. DEPARTMENT OF ENERGY

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear before you today to discuss S. 2589 entitled the "Nuclear Fuel Management and Disposal Act." Enactment of this bill would significantly enhance the Nation's ability to manage and dispose of spent nuclear fuel and high-level radioactive waste. I thank Senator Inhofe and Senator Domenici for taking up this critical issue and introducing the legislation.

Over the last 50 years, our country has benefited greatly from nuclear energy and the power of the atom. We need to ensure a strong and diversified energy mix to fuel our Nation's economy, and nuclear power is an important component of that mix. Currently more than 50,000 metric tons of spent nuclear fuel is located at more than 100 above-ground sites in 39 States, and every year reactors in the United States produce an additional approximately 2,000 metric tons of spent fuel. In order to ensure the future viability of our nuclear generating capacity, we need a safe, permanent, geologic repository for spent nuclear fuel at Yucca Mountain.

Recently the Department announced its plans to submit a License Application for the repository to the Nuclear Regulatory Commission (NRC) by June 30, 2008, and to initiate repository operations in 2017. This opening date of 2017 is a "best-achievable schedule" and is predicated upon enactment of the pending legislation. This proposed legislation addresses many of the uncertainties, currently beyond the control of the Department, that have the potential to significantly delay the opening date for the repository. I would like to briefly summarize the bill's provisions for the committee.

First, the most important factor in moving the Yucca Mountain Project forward is the ability of the Department to have access to the Nuclear Waste Fund to ensure adequate funding is available to meet the requirements necessary to construct and operate a repository. By making a technical budgetary scoring change, the proposed legislation would correct a structural budget problem by changing the budgetary treatment of the Nuclear Waste Fund fee, from mandatory receipts to discretionary offsetting collections equal to annual appropriations from the fund. Funding for the Program would still have to be requested by the President and Congressional appropriations from the Fund would still be required.

Second, to meet NRC licensing requirements it will also be necessary for Congress to approve the permanent withdrawal of the lands needed for the operational area of the repository. The bill would withdraw permanently from public use approximately 147,000 acres of land in Nye County, Nevada. The Department is confident that the permanent withdrawal of land would meet the NRC licensing requirement for the Yucca Mountain repository and would help assure protection of public health and the environment.

Third, to promote efficient management and disposal of the current and projected future inventories of commercial spent nuclear fuel located at reactors throughout the United States, the proposed legislation would eliminate the current statutory 70,000 metric ton cap on disposal capacity at Yucca Mountain and allow for maximum use of the mountain's true technical capacity. By eliminating an artificial statutory limit and allowing the NRC to evaluate the actual capacity at Yucca Mountain, this provision would help provide for safe isolation of the Nation's entire commercial spent nuclear fuel inventory from existing reactors, including life extensions, and may postpone the need for a second repository elsewhere until the next century.

In addition, the proposed legislation includes a number of provisions that would promote prompt consideration of issues associated with the Yucca Mountain repository or would address other matters that have the potential to cause delays in moving forward with the Yucca Mountain Project.

First, the proposed legislation contains provisions that would provide for a more streamlined NRC licensing process by amending the licensing process in several respects. In particular, the legislation would make clear that an application for construction authorization need not include information on surface facilities other than those facilities necessary for initial operations. The bill would also establish an expedited 1-year schedule and a simplified, informal process for the NRC to consider the license amendment for the Department to receive and possess nuclear materials as well as for other future license amendment actions. The bill would also direct that the NRC, consistent with other provisions of the Nuclear Waste Policy Act of 1982, need not consider in its environmental review any actions taken outside of the geologic repository operations area; this will help focus the licensing process.

Second, the proposed legislation would permit early initiation of infrastructure and pre-construction activities at the Yucca Mountain site for utility, communica-

tions, and safety upgrades, and the construction of a rail line to connect the Yucca Mountain site with the national rail network prior to receipt of an NRC construction authorization for the repository. Construction of repository surface and sub-surface nuclear facilities would still require a construction authorization from the NRC.

Third, the proposed legislation includes additional provisions that would simplify the regulatory framework for the repository. In particular, the legislation would designate the Environmental Protection Agency as the appropriate agency to issue, administer, and enforce any air quality permits required in connection with the Yucca Mountain repository. Material owned, transported and stored in NRC-licensed containers and NRC-licensed materials at Yucca Mountain would also be exempt from Federal, State, and local environmental requirements under the Resource Conservation and Recovery Act. The intent is to ensure that dual regulatory requirements do not apply to the same waste streams, once they are ready to be shipped to a repository for disposal. These provisions would simplify the regulatory framework for the repository without compromising environmental protection or safety.

Fourth, the proposed legislation would address the use of water needed to carry out the authorized functions under the Nuclear Waste Policy Act of 1982. This legislation would allow the Department to be treated like a private business in requesting water access, resulting in non-discriminatory treatment of the Department. The State of Nevada would still review and administer water allocation to the Department under this provision.

Fifth, the proposed legislation would address transportation and ensure the expedited movement of shipments to Yucca Mountain. In this regard, the legislation would provide the flexibility for the DOE to regulate the transport of spent nuclear fuel and high-level radioactive waste to the repository in the same manner that we currently conduct transportation of nuclear weapons. The Department has been transporting such nuclear materials safely for many years. In addressing this issue, we are not proposing to change in any way our route planning activities with State, Tribal and local authorities or how we work with them on emergency planning, training, and education. This provision would reflect our longstanding commitment to transporting nuclear material in a manner that meets or exceeds NRC and Department of Transportation requirements for transportation of comparable material. Likewise, it would permit continuing our longstanding practice of working with State, Tribal and local governments, transportation service providers, and other Federal agencies to utilize their resources and expertise to the maximum extent practicable.

Finally, the proposed legislation would promote the licensing of new nuclear facilities by addressing the need for a regulatory determination of waste confidence by the NRC in connection with proceedings for those new nuclear facilities. This provision directs the Commission to deem that sufficient capacity will be available to dispose of spent nuclear fuel in considering whether to permit the construction and operation of a nuclear reactor or a related facility.

CONCLUSION

Nuclear power has been demonstrated to be a safe, reliable, and efficient source of power. Enactment of the proposed legislation is necessary to allow the Yucca Mountain Project to move forward and to advance the Nation's energy independence, energy security, and national security objectives. Mr. Chairman, I look forward to working with you and the Members of this Committee on this legislation to facilitate the construction and operation of the repository and to ensure the continued development of safe, clean, and efficient nuclear power in this country. I would be pleased to answer any questions at this time.

RESPONSES BY EDWARD F. SPROAT III TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. Isn't it more cost-effective for taxpayers to have commercial nuclear waste transferred to one centralized storage location, as in the case of the Waste Isolation Pilot Plant, versus having multiple storage sites?

Response. Yes, in general it is more cost-effective and practical to design, license, construct, and operate one storage site.

Question 2. In addition to passing S. 2610 (a bill to enhance the management and disposal of spent nuclear fuel and high-level radioactive waste) and S. 2589, the Nuclear Fuel Management and Disposal Act, what other legislative actions in addition to those mentioned at the hearing can Congress take to help expedite the operation date (2017) for Yucca Mountain as you stated in your testimony?

Response. S. 2589 contains all the provisions of the Administration's legislative proposal. S. 2610 contains a subset of the provisions provided by the Administration. To the extent that legislation is passed that addresses all the provisions of the Administration's proposal, the Department does not believe any additional legislative actions would be necessary to facilitate commencement of operations by 2017. Commencing operations by this date, however, will be dependent on a number of other factors, such as the absence of litigation delays.

Question 3. The third panel witnesses talked extensively about maintaining flexibility in repository development plans. Do you think that we should take into account repository development plans that maintain flexibility for future generations, and do you believe this is important?

Response. Yes, the Department believes flexibility should be maintained for future generations and is designing the repository to provide such flexibility. The Nuclear Regulatory Commission has specific regulatory requirements for the design of the Yucca Mountain repository including the need to demonstrate retrievability of waste materials for a minimum of 50 years. In addition, the Department currently plans to provide capability to monitor the high-level radioactive waste and spent nuclear fuel in the repository for up to 300 years.

RESPONSES BY EDWARD F. SPROAT III TO ADDITIONAL QUESTIONS FROM SENATOR VOINOVICH

Question 1. Mr. Sproat, as discussed during the hearing, please provide for the record a detailed information on the Nuclear Waste Fund, explaining what it is, how much was collected, how much was spent, how much is there, and whether any of it is committed for purposes other than originally intended for.

Response. Section 302(c) of the Nuclear Waste Policy Act authorizes the Nuclear Waste Fund in the U.S. Treasury to consist of all receipts, proceeds, and recoveries collected by the Department from utilities under contract with the Government for the disposal of their spent nuclear fuel and high-level radioactive waste. The fees paid by utilities are deposited quarterly into the Nuclear Waste Fund and invested in U.S. Treasury securities. By the end of 2005, the Nuclear Waste Fund had received $14.276 billion from fees and $10.572 billion from interest earnings. The Department has spent $6.576 billion from the Nuclear Waste Fund, and the balance of the Fund at the end of 2005 was $18.272 billion. The Government is not authorized to use funds from the Nuclear Waste Fund for any purpose other than as directed in section 302(d) and in annual appropriations from the Fund.

Question 2. You discussed briefly about the Federal Government's financial liability associated with DOE's non-performance on the existing standard contracts. What are the potential financial implications for the Government from continued delay in meeting the Federal obligations to deal with used nuclear fuel?

Response. The amount of damages due utilities is currently a matter of litigation. The Department, however, has estimated that the Government's liability could be up to $7 billion if the Yucca Mountain repository commences operations in 2017. For each year that Yucca Mountain is delayed beyond 2017, the Government's liability will increase. For example, the Department has estimated that the Government's liability could be up to $11 billion if the Yucca Mountain repository does not commence operations until 2020.

Question 3. If the capacity of Yucca Mountain could be expanded as suggested by Electric Power Research Institute (EPRI), and advanced technologies could be deployed to recycle much of the material in used nuclear fuel, is it possible that Yucca Mountain might be the only repository the United States will ever need?

Response. The Administration's legislative proposal would repeal the statutory limit of 70,000 MTU on the amount of high-level radioactive waste and spent nuclear fuel that can be emplaced in the Yucca Mountain repository prior to the construction of a second repository. While the Department has not determined the maximum physical capacity of the Yucca Mountain site, it believes that, at a minimum, that the site can contain all the spent nuclear fuel and high-level radioactive waste expected to be generated by the current fleet of commercial reactors throughout their life time as well as all existing Defense waste. If the statutory limit in the Nuclear Waste Policy Act is repealed, the Yucca Mountain repository will be the only repository necessary in the foreseeable future, even without consideration of potential efficiencies resulting from the introduction of advanced recycling technologies.

Question 4. Uncertainties about when Yucca Mountain will be licensed to accept fuel have led to considerable interest in interim storage options. What authority does DOE currently have for interim storage?

Response. Under Subtitle C of the Nuclear Waste Policy Act, the Department has authority to establish a monitored retrievable storage (MRS) facility, subject to specific conditions that tie the construction and operation of an MRS to the construction and operation of the Yucca Mountain Repository. Given those conditions, the Department has not pursued the development of an MRS facility since such a facility could not commence operation appreciably before the Yucca Mountain repository could begin accepting waste.

Prior to the enactment of the Nuclear Waste Policy Act of 1982 (NWPA) DOE had authority and continues to have authority, to accept spent nuclear fuel in certain circumstances. Section 55 of the Atomic Energy Act of 1954, as amended, (AEA) (42 U.S.C. 2075), provides that "DOE is authorized to the extent it deems necessary to effectuate the provisions of [the Act] to purchase, . . . take, requisition, condemn or otherwise acquire any special nuclear material or any interest therein." The authority under the AEA may be exercised to further any of its purposes including international cooperation and nuclear nonproliferation, support of research and development in nuclear power, and management of the U.S. nuclear defense programs. 42 U.S.C. 2111, 2112, 2013, 2051(a) and 2152.

Pursuant to this AEA authority, the Department has accepted and stored spent nuclear fuel returned from countries where the United States provided the original nuclear fuel assemblies for another country's use, under bi-lateral agreements. This is often referred to as foreign reactor fuel. DOE has also used this authority to accept for research and development purposes small amounts of spent nuclear fuel such as parts of the Three Mile Island melted reactor core and other damaged spent nuclear fuel. DOE also accepted and now owns commercial spent fuel under arrangements made with utilities prior to the enactment of the NWPA.

With enactment of the NWPA, Congress provided a detailed statutory scheme for commercial spent nuclear fuel storage and disposal that, by its specificity, severely limited the Department's commercial spent nuclear fuel storage and disposal options.

The NWPA did not affect the Department's authority to accept spent fuel not covered by the Standard Contract arrangement between utilities and the Department established in 1983 after the enactment of the NWPA. However, the NWPA limits DOE'S authority under the AEA to accept spent nuclear fuel from commercial reactors subject to the Standard Contract to the situations specified in the NWPA and, in very limited circumstances, to specific research and development activities that further the goals of the NWPA. 42 U.S.C. 10199.

Question 5. The House passed FY 2007 Energy and Water Development appropriations bill included $30 million to initiate the process for selecting and licensing one or more interim storage sites, subject to Congress providing necessary statutory authority. Has the Department considered this proposal? Have you considered what legislative provisions would be necessary to carry out this direction?

Response. In the absence of a statutory provision such as that proposed by S. 3962, the "Nuclear Fuel Management and Disposal Act" the Department would be limited to carrying out this direction in conformity with Subtitle C of the Nuclear Waste Policy Act.

RESPONSE BY EDWARD F. SPROAT III TO A QUESTION FROM SENATOR VOINOVICH DURING THE HEARING

Question. My question is: where does the money come from? It has not been put into some special investment fund, has it? Or has it?

Response. The annual fees paid by utilities are deposited quarterly into the Nuclear Waste Fund in the U.S. Treasury; funds are invested in securities issued by the U.S. Treasury. The Nuclear Waste Policy Act directed that the repository program be a full-cost recovery program. The receipts and interest of the Fund are intended to pay for all Program costs for disposal of spent nuclear fuel.

The Nuclear Waste Fund is managed by the Office of Civilian Radioactive Waste Management. Investment strategies are designed and managed to provide sufficient access to liquid assets for the near term while maximizing returns on long-term investments. The Nuclear Waste Fund is invested in Treasury bills for very short-term Program needs, Treasury notes and bonds for short and intermediate Program needs, and Treasury zero-coupon bonds for long-term Program requirements. Treasury Inflation Protected Securities (TIPS) are also used for intermediate-term needs.

The Program's investment strategy is designed to protect against fluctuations in interest rates and program costs. By matching the values of Program net spending with investment maturities, the effects of interest rate changes can be minimized. It is anticipated that the Program will need funds from the Nuclear Waste Fund for more than 100 years, through the end of the repository operations and eventual closure.

Enclosed for your information is the 2006 investment portfolio report which is sorted by investment type and maturity date.

Department of Energy

Consolidated Accounting & Investment System

Investment Portfolio Report

Nuclear Waste Fund

Sorted By: Investment Type, Maturity Date, Investment Id (Price Per Hundred)

Report Date : 9/2006

Invest Date	Invest ID	Remaining Face Amount	Book Value	Market Value(ZCB) /eCDs	Unamortized Discount Bal.	Unamortized Premium Bal.	Prepaid Interest	6 Month Collection Amt.	Int/Inv Rate	PPH/Bid Price	Interest Dates	Maturity Date	Call Date
Bills													
Bills Totals:		**0**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**					
Notes													
03/01/2002	N020301A	21,046,000	22,063,098.21	0.00	0.00	1,017,098.21	0.00	683,995.00	0.065000	110.234375000	02/15 - 08/15	02/15/2010	
08/01/2003	N030801A	26,019,000	28,193,658.29	0.00	0.00	2,174,658.29	0.00	845,617.50	0.065000	115.265625000	02/15 - 08/15	02/15/2010	
08/15/2003	N030815A	255,000,000	275,997,316.12	0.00	0.00	20,997,316.12	0.00	8,287,500.00	0.065000	114.953125000	02/15 - 08/15	02/15/2010	
04/04/2001	N010404A	278,272,000	285,178,824.22	0.00	0.00	6,906,824.22	0.00	8,000,320.00	0.057500	105.265625000	02/15 - 08/15	08/15/2010	
09/04/2001	N010904A	396,357,000	406,611,780.44	0.00	0.00	10,254,780.44	0.00	11,395,263.75	0.057500	105.296875000	02/15 - 08/15	08/15/2010	
09/05/2001	N010905A	10,122,000	10,374,816.10	0.00	0.00	252,816.10	0.00	291,007.50	0.057500	105.109375000	02/15 - 08/15	08/15/2010	
02/01/2002	N020201B	62,935,000	64,653,432.26	0.00	0.00	1,718,432.26	0.00	1,809,381.25	0.057500	105.390625000	02/15 - 08/15	08/15/2010	
05/01/2002	N020501A	79,134,000	78,990,483.40	0.00	143,516.60	0.00	0.00	1,978,350.00	0.050000	99.671875000	02/15 - 08/15	02/15/2011	
06/03/2002	N020603A	453,332,000	452,292,394.10	0.00	1,039,605.90	0.00	0.00	11,333,300.00	0.050000	99.809375000	02/15 - 08/15	08/15/2011	
08/01/2002	N020801A	286,000,000	293,804,089.28	0.00	0.00	7,804,089.28	0.00	7,150,000.00	0.050000	104.640625000	02/15 - 08/15	08/15/2011	
11/15/2002	N021115A	68,000,000	71,102,212.66	0.00	0.00	3,102,212.66	0.00	1,700,000.00	0.050000	107.609375000	02/15 - 08/15	08/15/2011	
08/01/2001	N010801A	34,000,000	40,422,430.49	0.00	0.00	6,422,430.49	0.00	1,997,500.00	0.117500	144.125000000	05/15 - 11/15	11/15/2014	11/15/2009
11/01/2001	N011101A	83,974,000	122,383,979.42	0.00	0.00	38,409,979.42	0.00	4,723,537.50	0.112500	165.375000000	02/15 - 08/15	02/15/2015	
02/15/2002	N020215A	69,906,000	97,605,893.45	0.00	0.00	27,699,893.45	0.00	3,932,212.50	0.112500	154.984375000	02/15 - 08/15	02/15/2015	
11/02/1998	N981102A	78,518,000	110,626,825.05	0.00	0.00	32,108,825.05	0.00	4,416,637.50	0.112500	166.156250000	02/15 - 08/15	02/15/2015	
11/16/1998	N981116A	43,266,000	60,712,389.79	0.00	0.00	17,446,389.79	0.00	2,433,712.50	0.112500	165.000000000	02/15 - 08/15	02/15/2015	
05/02/2002	N020502A	40,800,000	51,730,480.47	0.00	0.00	10,930,480.47	0.00	1,887,000.00	0.092500	135.312500000	02/15 - 08/15	02/15/2018	
03/01/1996	N960301C	18,000,000	18,913,190.78	0.00	0.00	913,190.78	0.00	652,500.00	0.072500	107.968750000	05/15 - 11/15	05/15/2016	
04/03/1996	N960403A	172,500,000	181,111,609.33	0.00	0.00	8,611,609.33	0.00	6,468,750.00	0.075000	107.562500000	05/15 - 11/15	11/15/2016	
03/01/1996	N960301B	53,100,000	62,620,401.30	0.00	0.00	9,520,401.30	0.00	2,356,312.50	0.088750	126.562500000	02/15 - 08/15	08/15/2017	

Invest Date	Invest ID	Remaining Face Amount	Book Value	Market Value(ZCB) /#CDs	Unamortized Discount Bal.	Unamortized Premium Bal.	Prepaid Interest	6 Month Collection Amt.	Int/Inv Rate	PPH/Bid Price	Interest Dates	Maturity Date	Call Date
05/15/2002	N020515B	23,549,000	29,746,170.03	0.00	0.00	6,197,170.03	0.00	1,044,986.88	0.088750	131.906250000	02/15 - 08/15	02/15/2019	
Notes Totals:		**2,553,930,000**	**2,766,135,475.19**	**0.00**	**1,183,122.50**	**212,488,597.69**	**0.00**	**43,387,884.38**					
Overnights													
09/29/2006	D20060929	51,737,000	51,737,000.00	0.00	0.00	0.00	0.00	0.00	0.000060			10/02/2006	
Overnights Totals:		**51,737,000**	**51,737,000.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**					
TIPs													
11/03/2004	T041103A	56,127,760	58,458,036.40			2,330,276.40	0.00	617,500.00	0.023750	104.626125000	01/15 - 07/15	01/15/2025	
02/01/2005	T050201A	25,905,120	27,537,693.09			1,632,573.09	0.00	285,000.00	0.023750	107.203125000	01/15 - 07/15	01/15/2025	
08/01/2005	T050801A	313,020,200	326,738,556.72			13,718,356.72	0.00	3,443,750.00	0.023750	104.812500000	01/15 - 07/15	01/15/2025	
11/03/2004	T041103B	106,924,900	132,986,932.93			26,062,032.93	0.00	1,540,625.00	0.036250	127.500000000	04/15 - 10/15	04/15/2028	
02/01/2005	T050201B	47,801,720	61,159,767.56			13,358,047.56	0.00	688,750.00	0.036250	131.125000000	04/15 - 10/15	04/15/2028	
08/02/2005	T050802A	314,988,176	395,631,486.63			80,643,310.63	0.00	4,536,500.00	0.036250	127.609375000	04/15 - 10/15	04/15/2028	
11/03/2004	T041103C	133,865,120	173,077,008.97			39,411,888.97	0.00	2,092,500.00	0.038750	133.218750000	04/15 - 10/15	04/15/2029	
02/01/2005	T050201C	49,505,600	66,055,381.55			16,549,781.55	0.00	775,000.00	0.038750	137.187500000	04/15 - 10/15	04/15/2029	
08/02/2005	T050802B	315,598,200	413,540,863.88			97,942,663.88	0.00	4,940,625.00	0.038750	133.437500000	04/15 - 10/15	04/15/2029	
11/04/2004	T041104A	41,265,000	51,727,852.42			10,462,852.42	0.00	607,500.00	0.033750	128.562500000	04/15 - 10/15	04/15/2032	
11/15/2004	T041115A	37,253,125	46,118,766.00			8,865,641.00	0.00	548,437.50	0.033750	126.750000000	04/15 - 10/15	04/15/2032	
02/16/2005	T050216A	80,237,500	105,890,492.99			25,652,992.99	0.00	1,181,250.00	0.033750	135.625000000	04/15 - 10/15	04/15/2032	
08/02/2005	T050802C	166,206,250	209,966,781.93			43,760,531.93	0.00	2,446,875.00	0.033750	128.359375000	04/15 - 10/15	04/15/2032	
TIPs Totals:		**1,888,498,671**	**2,068,599,621.07**			**380,390,658.07**	**0.00**	**23,706,312.50**					
ZCBs													
10/18/1997	Z971016B	250,000,000	199,097,775.65	219,936,938.41	80,902,224.35	0.00	0.00	0.00	0.054450	40.28431		02/15/2012	

Department of Energy

Consolidated Accounting & Investment System

Investment Portfolio Report

Nuclear Waste Fund

Sorted By: Investment Type, Maturity Date, Investment Id (Price Per Hundred)

Report Date : 9/2006

Invest Date	Invest ID	Remaining Face Amount	Book Value	Market Value(ZCB) /#CDs	Unamortized Discount Bal.	Unamortized Premium Bal.	Prepaid Interest	6 Month Collection Amt.	Int/Inv Rate	PPH/Bid Price	Interest Dates	Maturity Date	Call Date
11/17/1997	Z971117A	180,000,000	125,487,143.10	138,391,492.83	54,512,856.90	0.00	0.00	0.00	0.062350	40.43791		08/15/2012	
08/01/2002	Z020801A	340,000,000	251,783,074.53	257,710,195.21	88,216,925.47	0.00	0.00	0.00	0.049640	60.37851		11/15/2012	
05/15/1998	Z980515A	120,000,000	80,618,525.53	88,864,846.55	39,381,474.47	0.00	0.00	0.00	0.069500	40.53275		05/15/2013	
12/11/1997	Z971211A	300,000,000	197,874,090.30	220,131,736.68	102,125,909.70	0.00	0.00	0.00	0.061450	38.70907		08/15/2013	
04/02/1998	Z980402A	610,000,000	394,001,705.37	435,591,867.09	215,998,294.63	0.00	0.00	0.00	0.060150	39.03296		02/15/2014	
05/01/2002	Z020501A	170,000,000	110,728,989.18	119,820,000.77	59,271,010.82	0.00	0.00	0.00	0.050000	50.82050		05/15/2014	
07/23/1998	Z980723A	135,000,000	87,196,032.53	95,151,177.08	47,803,967.47	0.00	0.00	0.00	0.058150	40.39439		05/15/2014	
09/04/2002	Z020904A	620,000,000	422,029,359.34	426,573,763.52	197,970,640.66	0.00	0.00	0.00	0.047900	56.13825		11/15/2014	
06/25/1998	Z980625A	600,000,000	366,259,510.82	403,525,685.30	233,740,489.18	0.00	0.00	0.00	0.058050	38.04142		05/15/2015	
11/05/2002	Z021105A	480,000,000	303,125,027.41	314,976,334.08	176,874,972.59	0.00	0.00	0.00	0.051010	51.88193		11/15/2015	
02/16/1999	Z990216A	576,000,000	337,310,553.11	373,737,457.33	238,689,446.89	0.00	0.00	0.00	0.057900	37.90201		02/15/2016	
08/03/1998	Z980803A	265,000,000	149,736,851.35	166,989,770.34	115,263,148.65	0.00	0.00	0.00	0.058650	35.25865		08/15/2016	
08/17/1998	Z980817A	275,000,000	157,037,890.26	173,291,271.10	117,962,109.74	0.00	0.00	0.00	0.057550	36.02447		08/15/2016	
09/05/2002	Z020905A	645,000,000	390,255,799.70	402,558,546.05	254,744,200.30	0.00	0.00	0.00	0.050240	49.44460		11/15/2016	
04/01/1999	Z990401A	915,000,000	468,395,339.04	540,375,937.84	446,604,660.96	0.00	0.00	0.00	0.061100	32.60101		11/15/2017	
06/01/1999	Z990601A	275,000,000	133,556,718.67	158,537,349.18	141,441,281.33	0.00	0.00	0.00	0.063100	30.80337		05/15/2018	
11/04/2002	Z021104A	1,125,000,000	585,998,892.26	632,031,026.13	539,001,107.74	0.00	0.00	0.00	0.054520	42.22024		11/15/2018	
01/15/1998	Z980115A	940,000,000	443,506,010.14	507,549,480.89	496,493,989.86	0.00	0.00	0.00	0.058200	28.38524		08/15/2019	
02/01/1999	Z990201A	300,000,000	142,388,242.37	157,658,456.42	157,611,757.63	0.00	0.00	0.00	0.056500	30.96858		02/15/2020	
07/01/1999	Z990701A	570,000,000	236,857,064.02	291,642,005.30	333,142,935.98	0.00	0.00	0.00	0.064300	26.26299		08/15/2020	
05/17/2000	Z000517A	940,000,000	380,015,268.85	469,018,424.55	559,984,731.15	0.00	0.00	0.00	0.064000	27.05913		02/15/2021	
05/18/2000	Z000518A	75,000,000	30,026,162.08	37,421,682.81	44,973,837.92	0.00	0.00	0.00	0.064700	26.68566		02/15/2021	
11/01/2000	Z001101A	430,000,000	174,765,046.34	206,511,687.75	255,234,953.66	0.00	0.00	0.00	0.060420	28.58386		11/15/2021	
11/15/2000	Z001115A	500,000,000	203,159,717.42	240,129,969.48	296,840,282.58	0.00	0.00	0.00	0.060440	28.63789		11/15/2021	

Department of Energy

Consolidated Accounting & Investment System

Investment Portfolio Report

Nuclear Waste Fund

Sorted By: Investment Type, Maturity Date, Investment Id (Price Per Hundred)

Report Date : 9/2006

Invest Date	Invest ID	Remaining Face Amount	Book Value	Market Value(ZCB) w/CDs	Unamortized Discount Bal.	Unamortized Premium Bal.	Prepaid Interest	6 Month Collection Amt.	Int/Inv Rate	PPH/Bid Price	Interest Dates	Maturity Date	Call Date
08/02/2002	Z020802A	383,000,000	152,572,771.70	174,334,285.24	210,427,228.30	0.00	0.00	0.00	0.058130	33.11534		11/15/2021	
08/01/2000	Z000801A	400,000,000	154,517,423.04	183,097,925.04	245,482,576.96	0.00	0.00	0.00	0.059860	26.85570		11/15/2022	
08/15/2000	Z000815A	520,000,000	241,271,438.41	283,801,783.82	378,728,561.59	0.00	0.00	0.00	0.059390	27.19072		11/15/2022	
09/02/2003	Z030902A	73,000,000	28,567,816.00	32,986,641.00	44,432,184.00	0.00	0.00	0.00	0.058120	32.81060		02/15/2023	
08/15/2003	Z030815A	101,000,000	37,891,237.62	44,618,901.52	63,108,762.38	0.00	0.00	0.00	0.058950	31.28728		08/15/2023	
11/03/1997	Z971103A	400,000,000	139,736,290.34	176,708,520.88	260,263,709.66	0.00	0.00	0.00	0.063300	20.05155		08/15/2023	
10/16/1997	Z971016A	610,000,000	201,409,979.81	262,100,900.92	408,590,020.19	0.00	0.00	0.00	0.064800	18.64976		02/15/2024	
12/11/1997	Z971211B	500,000,000	170,203,624.68	209,494,844.22	329,796,375.32	0.00	0.00	0.00	0.061200	20.02082		08/15/2024	
02/15/2001	Z010215A	855,000,000	295,993,175.36	350,503,953.26	559,006,824.64	0.00	0.00	0.00	0.058570	25.02010		02/15/2025	
05/01/2001	Z010501A	450,000,000	145,786,550.69	180,485,445.47	304,213,449.31	0.00	0.00	0.00	0.060100	23.44235		08/15/2025	
05/15/2001	Z010515A	95,000,000	30,030,951.88	38,102,482.93	64,969,048.12	0.00	0.00	0.00	0.061950	22.76697		08/15/2025	
08/18/2003	Z030818A	120,000,000	39,831,426.51	48,129,452.13	80,168,573.39	0.00	0.00	0.00	0.059290	27.96644		08/15/2025	
02/01/2001	Z010201A	490,000,000	165,479,503.94	192,192,905.12	324,520,496.06	0.00	0.00	0.00	0.058820	24.58939		02/15/2026	
05/15/2001	Z010515B	555,000,000	195,327,066.87	250,343,054.91	459,672,933.13	0.00	0.00	0.00	0.061810	21.49308		08/15/2026	
05/03/2004	Z040503A	639,000,000	208,328,555.39	244,227,904.71	430,671,444.61	0.00	0.00	0.00	0.057190	28.45817		08/15/2026	
08/02/2002	Z020802B	740,000,000	233,545,833.93	278,826,081.16	506,454,166.07	0.00	0.00	0.00	0.058130	24.86572		11/15/2026	
08/15/2002	Z020815A	450,000,000	150,964,925.36	169,556,400.70	299,035,074.64	0.00	0.00	0.00	0.055010	26.81876		11/15/2026	
05/17/2004	Z040517A	161,000,000	48,144,101.61	58,807,436.08	112,855,898.39	0.00	0.00	0.00	0.056670	26.06965		08/15/2027	
05/19/2004	Z040519A	328,000,000	97,368,874.93	119,805,453.64	230,631,125.07	0.00	0.00	0.00	0.059030	25.86680		08/15/2027	
02/13/2003	Z030213A	81,000,000	26,703,701.66	29,243,703.34	54,296,296.34	0.00	0.00	0.00	0.053220	27.24955		11/15/2027	
02/19/2003	Z030219A	1,495,000,000	492,966,951.66	539,744,894.92	1,002,033,948.34	0.00	0.00	0.00	0.053210	27.27986		11/15/2027	
02/02/2004	Z040202A	513,000,000	156,608,896.48	177,139,796.33	356,391,103.52	0.00	0.00	0.00	0.054350	26.47245		11/15/2028	
09/22/2004	Z040922A	143,000,000	46,431,854.68	49,378,149.85	96,568,145.32	0.00	0.00	0.00	0.051490	29.29809		11/15/2028	
02/02/2006	Z060202A	563,000,000	195,990,892.36	192,671,659.63	367,009,107.64	0.00	0.00	0.00	0.047720	33.74442		02/15/2029	

Department of Energy

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Nuclear Waste Fund

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02/16/2006	Z060216A	265,000,000	92,656,961.93	90,313,492.88	172,343,038.07	0.00	0.00	0.00	4.752000	33.95787		02/15/2029	
04/30/2004	Z040430A	1,134,000,000	311,230,892.82	373,536,248.05	822,769,107.18	0.00	0.00	0.00	0.056700	23.97717		11/15/2029	
02/17/2004	Z040217A	364,000,000	105,642,786.44	119,038,996.33	258,357,213.56	0.00	0.00	0.00	0.053630	25.26562		02/15/2030	
08/02/2004	Z040802A	542,000,000	150,610,677.00	177,250,373.66	391,389,323.00	0.00	0.00	0.00	0.055400	24.68577		02/15/2030	
08/16/2004	Z040816A	380,000,000	108,543,415.79	124,271,479.69	271,456,584.21	0.00	0.00	0.00	0.054330	25.49245		02/15/2030	
09/01/2005	Z050901B	1,515,000,000	549,497,504.34	495,450,767.71	965,502,495.66	0.00	0.00	0.00	0.043960	34.61192		02/15/2030	
03/06/2006	Z060306A	87,000,000	28,628,313.06	28,451,628.24	58,371,686.94	0.00	0.00	0.00	0.048120	32.02234		02/15/2030	
11/03/2003	Z031103A	669,000,000	186,118,219.21	208,966,008.78	482,881,780.79	0.00	0.00	0.00	0.053180	23.88262		02/15/2031	
11/17/2003	Z031117A	150,000,000	43,131,428.30	46,853,365.19	106,868,571.70	0.00	0.00	0.00	0.051790	24.82968		02/15/2031	
05/02/2005	Z050502A	495,000,000	168,980,550.97	154,619,105.14	328,019,449.03	0.00	0.00	0.00	0.045080	31.67105		02/15/2031	
05/16/2005	Z050516A	132,000,000	44,581,255.73	41,230,961.37	87,418,744.27	0.00	0.00	0.00	0.045030	31.76563		02/15/2031	
08/15/2005	Z050815A	253,000,000	87,077,104.77	79,026,009.29	165,922,895.23	0.00	0.00	0.00	0.044240	32.76452		02/15/2031	
09/01/2005	Z050901A	1,625,000,000	577,170,285.23	507,578,122.92	1,047,829,714.77	0.00	0.00	0.00	0.042920	33.92768		02/15/2031	
10/04/2005	Z051004A	56,000,000	18,560,635.52	17,491,923.01	37,439,364.48	0.00	0.00	0.00	0.045820	31.69149		02/15/2031	
11/02/2005	Z051102A	489,000,000	156,494,665.43	152,741,970.53	332,505,314.57	0.00	0.00	0.00	0.047290	30.68979		02/15/2031	
05/03/2006	Z060503A	781,000,000	209,402,262.38	233,617,996.22	571,597,737.62	0.00	0.00	0.00	5.255000	26.24467		02/15/2032	
08/03/2006	Z060803A	519,000,000	140,974,745.17	148,112,358.88	378,025,254.83	0.00	0.00	0.00	5.003000	26.95123		02/15/2033	
08/16/2006	Z060816A	221,000,000	60,309,339.84	63,069,039.14	160,690,660.16	0.00	0.00	0.00	4.985000	27.12544		02/15/2033	
ZCBs Totals:		**32,188,000,000**	**13,064,496,798.31**	**14,426,047,126.52**	**19,123,803,201.68**	**0.00**	**0.00**	**0.00**					
Grand Totals:		**36,482,068,671**	**17,950,259,894.57**	**14,426,047,126.52**	**19,124,586,324.19**	**592,679,547.76**	**0.00**	**107,094,196.88**					

STATEMENT OF R. SHANE JOHNSON, PRINCIPAL DEPUTY ASSISTANT SECRETARY FOR NUCLEAR ENERGY, U.S. DEPARTMENT OF ENERGY

Chairman Voinovich, Senator Carper, and members of the subcommittee, it is a pleasure to be here today to discuss the Department's activities associated with building new nuclear capacity in the United States and expanding the use of nuclear energy around the world. As the next generation of nuclear powerplants is designed, licensed, and constructed, it is certain that these activities will have near- and long-term resource implications for the Nuclear Regulatory Commission (NRC). I will defer to Mr. Luis Reyes of the NRC who I understand is testifying before you today to present those specific impacts. However, I will present the status and projected progress of our nuclear programs that will likely form the basis of these resource requirements.

With dozens of new nuclear plants under construction, planned or under consideration world-wide, many countries around the world are clearly moving forward with new nuclear plants. In the United States, we are nearing completion of the initial phase of preparations for a new generation of nuclear plants. Through the Nuclear Power 2010 program and incentives contained in the Energy Policy Act of 2005 (EPACT 2005), Government and industry are working together to address regulatory and financial impediments that the first purchasers of new plants face.

In addition, the Department is committed to addressing the fundamental research and development issues necessary to establish the viability of next-generation nuclear energy system concepts. Successfully addressing the fundamental research and development issues of Generation IV system concepts that excel in safety, sustainability, cost-effectiveness and proliferation-resistance will allow these advanced systems to be considered for future commercial development and deployment by the private sector. Expectations for the development, demonstration and design, construction and operation of the Next Generation Nuclear Plant or NGNP, are clearly outlined in EPACT 2005. A decision on whether to proceed beyond the current R&D phase will be made in 2011.

Finally, we are implementing the Global Nuclear Energy Partnership, or GNEP, an initiative launched by the Department of Energy in February of this year. GNEP is a comprehensive approach to increase global energy security. It will seek the expanded use of nuclear power as a clean energy resource, while reducing the risk of nuclear proliferation.

NUCLEAR POWER 2010

The Nuclear Power 2010 program, launched in 2002, addresses the regulatory and financial uncertainties associated with siting and building new nuclear plants by working in cost-shared cooperation with industry to identify sites for new nuclear powerplants, by developing and bringing advanced standardized plant designs to the market, and by demonstrating untested regulatory processes. Nuclear Power 2010 is focused on Generation III+ reactor technologies, which are advanced, light water reactor designs, offering advancements in safety, security, and economics over the Generation III designs certified by the NRC in the 1990s.

The Department is currently sponsoring cooperative projects for preparation of Early Site Permits (ESP) for three commercial sites. The ESP process includes resolution of site safety, environmental, and emergency planning issues in advance of a power company's decision to build a new nuclear plant. The three ESP applications are currently in various stages of NRC review, and licensing decisions are expected by the end of 2007.

In fiscal year 2005, the Department established competitively selected, cost-shared cooperative agreements with two power company-led consortia to obtain combined Construction and Operating Licenses (COL). The Department selected Dominion Energy and NuStart, a consortium of ten electric generating companies, to conduct the licensing demonstration projects to obtain NRC licenses and operate a total of two new nuclear powerplants in the U.S. Dominion is preparing an application for the North Anna site in Virginia, and NuStart is preparing an application which will use DOE funding to move a COL forward on either the Bellefonte site in Alabama or the Grand Gulf site in Mississippi. The two project teams involved in these two licensing demonstration projects represent power generation companies that operate more than two-thirds of all the U.S. nuclear powerplants producing electricity today. Both consortia are on track to submit COL applications to the NRC in late 2007. Joint efforts will continue to complete the necessary design certification steps to support two COL applications. Industry is planning for issuance of the NRC licenses by the end of 2010. It is possible that a utility decision to build a new plant could be announced as early as 2008, with construction starting in 2010, and a new plant operational by 2014.

Already this approach has encouraged power companies from these consortia to apply for COLs. Several have specifically stated that they are building on work being done in the Nuclear Power 2010 program as the basis for their applications. In addition, UniStar, a consortium of Constellation, AREVA and Bechtel Power, announced plans to pursue new nuclear plants. In June, NRG Energy, Inc. also announced plans to pursue construction of two additional reactors at their two-unit South Texas Project nuclear power station. Earlier last month, the NRC indicated that it expects 19 new combined COL applications for 27 new reactors.

FEDERAL GOVERNMENT RISK MANAGEMENT ACTIONS

Last year, the President proposed and Congress established the Standby Support provisions of EPACT 2005 (section 638) to encourage the construction of new advanced nuclear powerplants in the United States by addressing regulatory and litigation risks to first "movers" of these new plants. Under section 638, the Secretary can enter into contracts to insure project sponsors against certain delays that are outside the control of the sponsors and to provide coverage for up to six reactors, but for no more than three different advanced reactor designs. The level of coverage is distinguished between the first "initial two reactors," for which the Secretary will pay 100 percent of covered costs up to $500 million per contract and "subsequent four reactors," for which the Secretary will pay 50 percent of covered costs up to $250 million per contract after an initial 180-day delay.

I am pleased to report that last month, prior to the first year anniversary of EPACT's enactment, the Department issued the final rule for the Standby Support program.

EPACT 2005 contains other key provisions aimed at providing incentives to build new nuclear plants. One of these is the creation of a production tax credit program for new advanced nuclear generation. EPACT 2005 (section 1306) permits a taxpayer producing electricity at a qualified advanced nuclear power facility to claim a credit equal to 1.8 cents per kilowatt-hour of electricity produced for 8 years. The provision also specifies a national megawatt capacity limitation of 6,000 megawatts for which tax credits could be given. The tax credit is administered by the Department of Treasury, in consultation with the Department of Energy. The Treasury Department recently published guidelines for approving these tax credits, allowing us to move ahead in this process.

Lastly, EPACT 2005 (Title 17) authorizes the Secretary of Energy to enter into loan guarantees for projects that avoid, reduce, or sequester air pollutants or emissions of greenhouse gases and that use new and significantly advanced energy technologies, including advanced nuclear powerplants. In August 2006, the DOE published Guidelines for the Loan Guarantee Program in the Federal Register that specify the process by which DOE will solicit and review project proposals. Also in August 2006, DOE issued the first of multiple solicitation announcements inviting interested parties to submit project proposals. Although the first solicitation does not address nuclear projects, utilities interested in building new nuclear powerplants will be eligible for future loan guarantee solicitations, which will help them lower the cost of borrowing the substantial up-front capital associated with these major projects. Combined with delay risk insurance, loan guarantees will reduce uncertainty and thereby reduce costs of obtaining investment capital for initial sponsors of new nuclear plants.

NEXT GENERATION NUCLEAR PLANT

EPACT 2005 (sections 641 through 645) establishes expectations for research, development, design, construction, and operation of a prototype nuclear plant which will provide electricity and/or hydrogen.

These EPACT provisions establish two distinct phases for the project. In Phase I, to be completed by 2011, DOE is directed to select the hydrogen production technology, develop initial reactor design parameters, and, jointly with the NRC, develop a licensing strategy for the NGNP. Phase I is the research and planning part of the initiative and it is the phase in which the Department is currently engaged. EPACT 2005 also directs the Department to complete, as part of Phase II, the design, licensing and construction of the NGNP by 2021.

This year, we will begin working in earnest with the NRC to develop a licensing strategy for the technology, which pursuant to EPACT 2005 must be submitted to Congress by August 8, 2008. We have allocated $2 million of our Fiscal Year 2007 budget towards this interagency collaboration. Licensing a prototype reactor by the NRC and obtaining certification of the nuclear system design will present a significant challenge and may be very difficult to accomplish in the timeframe contemplated. In developing a licensing strategy, DOE and NRC will examine mecha-

nisms that are best suited for making information available to support a license application and for evaluating that information. In addition, the strategy will address staffing resources needed to support the licensing of both NGNP and new commercial reactors.

GLOBAL NUCLEAR ENERGY PARTNERSHIP

Partnerships between the U.S. Government, industry, and other nations can help to increase the use of nuclear power throughout the world. Cooperation and cost-sharing with other countries is also vital to ensure that other nations use nuclear power safely and securely. That is the basis of GNEP launched earlier this year by the Department and included in President Bush's Advanced Energy Initiative. This new initiative is based on a simple principle: energy and security can go hand in hand.

GNEP is a comprehensive strategy to lay the foundation for expanded use of nuclear energy in the United States and the world by demonstrating and deploying new technologies that recycle nuclear fuel, significantly reduce waste, and help to address proliferation concerns.

In addition to developing separations, fuel fabrication, and reactor technologies, we also propose to create an approach which provides fuel and reactors that are appropriately sized for the energy requirements of countries in need of nuclear energy. We also seek to encourage the future provision of fuel from fuel cycle nations in a way that allows new nations to enjoy the benefits of abundant sources of clean, safe nuclear energy in exchange for their commitment to forgo enrichment and reprocessing activities, to help address nuclear proliferation concerns. We have been working with other advanced nuclear nations to build consensus on productive approaches, incentives and safeguards. If we expect countries to forgo fuel cycle activities, they should be assured a reliable access to fuel which could be backed by designated supplies, governmental entities, and international bodies such as the International Atomic Energy Agency (IAEA).

Along with promoting the benefits of nuclear energy, one of GNEP's goals is to develop and demonstrate advanced technologies with enhanced proliferation-resistance that are incorporated into the processing of spent nuclear fuel and also to reduce the amount of nuclear wastes requiring permanent geological disposal.

As you know, the Department is pursuing the development and deployment of integrated spent fuel recycling facilities in the United States. These are technologies that do not result in a separated plutonium stream. Specifically, the Department proposes to develop and deploy the uranium extraction plus (UREX+) technology to separate the usable materials contained in spent fuel from the waste products. We also propose to deploy a fast reactor capable of consuming those usable products from the spent fuel while producing electricity.

Based on international and private sector response to GNEP, we believe there may be advanced technologies available to recycle used nuclear fuel ready for deployment in conjunction with those currently under development by DOE. In light of this information, DOE is investigating the feasibility of these advanced recycling technologies by proceeding with commercial demonstrations of these technologies. The technology, the scale and the pace of the technology demonstrations will depend in part on industry's response, including the business aspects of how to bring technology to full scale implementation.

Last month, DOE issued two requests for Expressions of Interest from domestic and international industry, seeking to investigate the interest and capacity of industry to deploy an integrated spent fuel recycling capability consisting of two facilities:

- A Consolidated Fuel Treatment Center, capable of separating the usable components contained in light water spent fuel from the waste products;
- An Advanced Burner Reactor, capable of consuming those usable products from the spent fuel while generating electricity;

The Department asked industry to provide input on the scale at which the technologies should be proven. Ultimately, as in the initial plan reported to the Congress in May, the Department ultimately seeks the full commercial-scale operations of these advanced technologies. It is premature, however, to say exactly what form or size the recycling facility will take until we analyze important feedback recently received from industry.

The integrated recycling facilities would include process storage of spent fuel prior to its recycling, on a scale proportionate to the scale of recycling operations. A third facility, the Advanced Fuel Cycle Facility, would be designed and directed through the Department's national laboratories and would be a modern state-of-the-art fuels laboratory designed to serve the fuels research needs to support GNEP.

We are now in the process of reviewing industry's response to last month's request for Expressions of Interest. Based on our limited review thus far, I can tell you that industry has responded positively and we look forward to working with industry.

In addition, last month the Department issued a Financial Assistance Funding Opportunities Announcement, seeking applications by September 7, 2006, from private and/or public entities interested in hosting GNEP facilities. Specifically, the Department will award grants later this fall for site evaluation studies. Congress made $20 million available [PL 109–474, FY 2006 Energy and Water Development Appropriations Bill], with a maximum of $5 million available per site. The information generated from these site evaluation studies may be used in the preparation of National Environmental Policy Act (NEPA) documentation that will evaluate potential environmental impacts from each proposed GNEP facility.

Except for those facilities specifically identified in section 202 of the Energy Reorganization Act, DOE regulates facilities which it operates or that are operated by contractors on DOE's behalf. DOE would expect that any GNEP facilities be designed, constructed, and operated in a manner suitable for NRC licensing and the application of IAEA safeguards, thereby facilitating the eventual commercialization of advanced recycling technologies.

We view GNEP and the Yucca Mountain repository as complementary endeavors. Under any scenario, the Yucca Mountain repository will be needed for legacy commercial spent fuel (that is, spent fuel already generated or generated in the future for which recycling capacity is not reasonably available), waste material resulting from recycling, and DOE spent fuel and defense high level waste.

If successful, GNEP will greatly expand the supply of affordable nuclear power around the world, while enhancing safeguards that help to enhance proliferation-resistance and assuring the availability of Yucca Mountain for generations to come.

CONCLUSION

As I describe in my testimony, the Department has numerous ambitious and concurrent initiatives underway which pave the way for the resurgence of nuclear power in the United States and the world. Each of these initiatives carries with it its own set of licensing issues and requirements, albeit on varying implementation schedules. NRC's ability to fulfill their licensing role in a timely and effective manner is a critical requirement for the successful resurgence of nuclear power in the United States and around the world.

Thank you. This concludes my formal statement. I would be pleased to answer any questions you may have at this time.

STATEMENT OF LUIS A. REYES, EXECUTIVE DIRECTOR OF OPERATIONS, U. S. NUCLEAR REGULATORY COMMISSION

INTRODUCTION

Mr. Chairman and Members of the Committee, it is a pleasure to appear before you today to discuss the U.S. Nuclear Regulatory Commission's (NRC's) capability to regulate long-term and short-term spent nuclear fuel storage and disposal. Specifically, I plan to address some of the national spent fuel management strategies that are being considered in S. 2589, the "Nuclear Fuel Management and Disposal Act;" S. 2610, a bill "to enhance the management and disposal of spent nuclear fuel and high-level radioactive waste, and for other purposes;" and section 313 of H.R. 5427, the "Energy and Water Development Appropriations Act, 2007." I also plan to discuss some of the implications of the Global Nuclear Energy Partnership.

It is important to make clear at the outset that, because of the NRC's role in the regulation of spent nuclear fuel and the potential application for a high-level radioactive waste repository at Yucca Mountain, Nevada, the Commission has not taken a position on most of the provisions in these legislative proposals. Therefore, I would like to focus on the impact the following proposals would have on the NRC.

INTERIM STORAGE

Spent fuel storage and transportation are and can be accomplished both safely and securely, consistent with the current regulatory framework, regardless of the number of sites and their locations. The NRC has stated in its Waste Confidence Decision that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impact in its spent fuel storage pool or at either on-site or off-site interim storage facilities for at least 30 years beyond the licensed operational life of the reactor. In general, the Commission concluded that, if stored properly, spent fuel presents a low risk to the public during normal oper-

ation or under potential credible accident conditions and can be stored safely in either wet or dry storage systems without significant environmental impact for at least 100 years.

It is important to note that the threat of sabotage has always been a factor in the design and licensing of spent fuel storage facilities. Following the September 11, 2001 terrorist attacks, the NRC issued Orders to licensees to implement additional security measures, and undertook a comprehensive reassessment of the security of commercial nuclear facilities including those for spent fuel storage. Since 9/11, NRC has issued Orders to licensees to implement additional security measures. Dry spent fuel storage casks are robust structures, which are highly resistant to significant damage, and we are confident that storage of spent fuel in dry casks remains a safe and secure spent fuel management strategy. Spent fuel pools are strong structures constructed of very thick steel-reinforced concrete walls with stainless steel liners located inside protected areas. The NRC's domestic safeguards program is focused on physically protecting and controlling spent nuclear fuel against sabotage, theft, and diversion.

The NRC supports efforts to address interim storage issues in a timely manner. Nuclear power plants need to increase their spent fuel storage capacity to support plant operations. In order to maintain operational capability in the spent fuel pool, including full core off-load capability, spent fuel must periodically be moved to dry cask storage. There are currently 43 licensed independent spent fuel storage installations (ISFSIs), and we expect in the next few years that this number will grow to over 50, as more power plants contend with filled spent fuel pools. The 43 current sites have successfully loaded and stored over 800 casks. An exceptional safety record has been achieved using dry cask storage technology.

Safety and security are the key elements in a comprehensive spent fuel management strategy. We must also be cognizant of the need for efficiency and effectiveness in every element of spent fuel handling, storage, and transport systems. The NRC believes that instituting canister and infrastructure standards will make storage and transportation both safer and easier, facilitating interoperability among handling and loading activities at different reactors and ISFSIs. Standards will also improve the ease with which these activities can be licensed. Canister and infrastructure standards should be developed with input from industry, taking advantage of lessons learned from previous designs.

The legislative proposal in H.R. 5427, as approved by the Senate Committee on Appropriations, includes new consolidation and preparation (CAP) facilities as part of a new national spent fuel management strategy. This proposal would significantly affect the NRC's spent fuel storage oversight program and resource needs. Specifically, H.R. 5427 calls for a high number of new storage facilities to be reviewed and licensed by NRC in a very short time span. Currently, the NRC has neither the monetary resources nor the necessary employee resources to support the technical review and adjudication of a large number of concurrent storage license applications as considered in H.R. 5427. Also, the timeframes in the draft legislation, which must allow for license preparation by the applicant, environmental and safety reviews by NRC and completion of associated hearings before the Atomic Safety and Licensing Board Panel, are very short and likely not achievable.

The NRC has reviewed the proposed legislation and believes that the existing regulatory infrastructure could accommodate the alternative approaches outlined in H.R. 5427. Although the NRC believes that it may be able to review and license a large number of new facilities anticipated in H.R. 5427 concurrently, the following items would be necessary prerequisites for success: sufficient funding; receipt of complete, high-quality license applications; and considerably more time to review and adjudicate the applications. NRC believes that centralized storage or storage at multiple sites in different locations can be achieved safely, consistent with our regulatory system. One must approach spent fuel management as an integrated system, balancing the very small risks associated with storage and transportation components. The Commission is open to working with our stakeholders in support of a systematic and integrated approach that is safe, timely, and efficient.

TRANSPORTATION

The NRC believes that the current, well-established transportation regulatory system is protective of public health and safety. Spent nuclear fuel has been safely transported in the United States for more than 30 years. There has never been an accident involving the transportation of spent fuel resulting in a radiological release or death or injury from radiation. The National Academy of Sciences recently completed a 3-year study that concluded that the radiological risks of spent fuel trans-

portation are low and well understood and that the existing regulations are adequate to ensure safety.

Any of the changes to a national spent fuel management strategy that are being considered (such as in S. 2589, S. 2610, and H.R. 5427) will involve shipping spent fuel. Federal regulation of spent fuel transportation is shared by the U.S. Department of Transportation (DOT) and the NRC. Generally, NRC does not regulate the U.S. Department of Energy's (DOE's) shipments of radioactive material; however, the Nuclear Waste Policy Act requires DOE to utilize NRC-certified casks for spent fuel shipments to a repository and to follow NRC's advance notification requirements. The Commission has reviewed and certified a number of package designs which could be used to transport spent fuel. Provisions of S. 2589, S. 2610, and H.R. 5427 may affect the transportation roles of DOE and DOT, but do not appear to affect the NRC role to certify casks as specified in the Nuclear Waste Policy Act. Section 313(c) of H.R. 5427 calls for licensing of DOE's spent fuel shipments by NRC and DOT. This means that NRC's physical protection requirements would be applicable to all of the DOE's shipments of spent nuclear fuel, and to this extent H.R. 5427 will increase NRC's responsibilities.

The NRC believes that the existing transportation regulatory infrastructure can accommodate the various legislative actions being considered. The transportation aspects of the various options and facilities do not present new or inherently different technical challenges. New transportation packages will need to be designed and certified to address: DOE initiatives on transport, aging, and disposal canisters; new types of spent fuel; or existing spent fuel that is not covered by current designs. As with the other topics addressed in this testimony, the NRC's ability to complete this work will depend upon sufficient appropriations and the submittal of complete, high quality applications.

DISPOSAL

The NRC understands the importance of addressing disposal of high-level radioactive waste in a manner that is both safe and timely. The NRC has a record of moving responsibly and promptly to meet its obligations under the Nuclear Waste Policy Act. To prepare for conducting an independent safety review of a Yucca Mountain application, the Commission continues to conduct pre-license application activities aimed at providing guidance so that DOE can provide a high quality application. NRC is confident that we will be ready to receive an application if submitted in 2008 as is currently proposed by DOE. We are also confident that we will reach a timely decision on the application provided that the application is complete and of high-quality.

The NRC offers the following comments on provisions in the proposed legislation, S. 2610, that could affect the timing of the NRC's review of a DOE application for an authorization to receive and possess spent nuclear fuel and high-level radioactive waste at Yucca Mountain. The proposed legislation would require the NRC to reach a final decision on receipt and possession within one year (with the possibility of a 6-month extension). This proposed requirement does not give the NRC sufficient time to complete its necessary proceedings. First, the NRC cannot complete both its safety review and the adjudicatory proceeding in 1 year. In particular, NRC will need to conduct a hearing. Even under the informal hearing process proposed in S. 2610, the NRC would need to adjudicate issues raised by participants that are admitted as contentious by the licensing board. It is difficult to predict the amount of time it will take to complete the review and adjudicate issues in controversy without knowing the scope and number of issues that will require adjudication as well as the number of parties involved. Second, the proposed legislation's provision regarding surface facilities could be read to provide for staged consideration of surface facilities. In this case, the NRC would review certain facilities during the construction authorization phase and other facilities during the later receipt and possession phase. Facilities that otherwise could have been reviewed in the construction authorization phase might be shifted to the receipt and possession phase, increasing the scope of review for that phase despite the reduced time allowed for that review.

S. 2589 and S. 2610 also contain a provision requiring the NRC, in deciding whether to permit the construction or operation of a nuclear reactor or any related facilities, to deem, without further consideration, that sufficient capacity will be available in a timely manner to dispose of spent nuclear fuel and high-level radioactive waste. H.R. 5427 contains a similar provision. The NRC does not object to these provisions of the legislation.

THE GLOBAL NUCLEAR ENERGY PARTNERSHIP

I would like to turn now to another facet of integrated high-level radioactive waste management, the Global Nuclear Energy Partnership (GNEP). The NRC has been meeting regularly with DOE to keep informed of and discern the NRC's role in the GNEP program as it unfolds. The DOE recently announced its interest in partnering with private industry in the development and deployment of a spent fuel separations/fuel fabrication facility (called the Consolidated Fuel Treatment Center (Center)) and an Advanced Burner Reactor (ABR). The DOE has indicated that its goals are to have the Center operational in 2018 and the ABR operational in 2020.

If the Center is considered to be a commercial facility, rather than a DOE facility, and if the ABR is a commercial facility or a demonstration reactor of the type described in section 202(2) of the Energy Reorganization Act, it will require the NRC to be involved in GNEP much sooner than originally expected. DOE had previously planned to operate smaller scale demonstration facilities prior to developing commercial scale facilities. If the NRC is to have licensing responsibilities, and the Center and ABR are to be completed and ready for operation according to DOE's schedule, the NRC could receive a Center application as early as 2009 or 2010. To that end, the NRC must make changes now to ensure that our regulations and guidance documents provide appropriate stability and predictability in our regulatory reviews.

Existing NRC regulations have been tailored over the years to be efficient for licensing the technologies commonly used in the United States (e.g., light-water reactors, uranium fuel facilities). Although these regulations could be used to license both the Center and the ABR, both reprocessing and advanced burner technologies (such as liquid metal-cooled reactors) have significantly different safety and technical considerations than light-water reactors. To facilitate the technical review and ensure a timely licensing process for these new technologies, NRC will need to revise existing regulations or develop new regulations and associated guidance documents.

In preparing to license these facilities and new technologies, NRC would need to begin recruiting for new employees, while developing expertise among existing staff in separations and advanced reactor technologies. This is no small task given the limited number of qualified individuals in this field and the significant hiring efforts already being undertaken by the NRC to meet its obligations related to new reactor applications.

Sufficient funding is needed to support regulatory infrastructure activities and increased staffing for GNEP. Funding for the NRC to develop the regulatory infrastructure for the Center and ABR in FY 2007 should be provided from the General Fund, because currently there are no licensees to support fee-recovery of the funds and because the NRC cannot be reimbursed for licensing activities that it is required to do by statute.

CONCLUSION

The NRC fully understands the importance of addressing the storage, transportation and disposal of high-level radioactive waste in a systematic and integrated manner that is safe, timely, and efficient. We would urge the Congress to assure that sufficient appropriations be made available to adequately fund regulatory infrastructure activities and increased staffing prior to the receipt of license applications initiating licensing activities. Provided sufficient resources and staffing levels are maintained and appropriate time is given to the Agency to conduct the necessary technical reviews and adjudications, we believe that we can reach decisions on the relevant applications in a timely fashion, assuming high-quality license applications are received.

On behalf of the Commission, I appreciate the opportunity to testify today and look forward to working with you on this legislation.

RESPONSE BY LUIS A. REYES TO AN ADDITIONAL QUESTION FROM SENATOR INHOFE

Question. Mr. Reyes stated that the NRC is prepared to receive 19 Combined Construction and Operation License (COLs) applications between 2007 and 2009. The projected number of COL applications has increased from about 12 to 19 in the space of 6 months. As of June, 2006 NRC staff informed my staff that the NRC planned on reviewing 2 COL applications, completing one design certification and completing five Early Site Permits (ESPs) in Fiscal year 2007 (this includes the $40 million expected in the Fiscal year 2007 Appropriation Bill). Given the already ambitious schedule for Fiscal Year 2007, could you please provide us with your budget

projects for Fiscal Year 2008 and Fiscal Year 2009 addressing any additional resources that might be needed to address the increase in COL applications?

Response. Currently, the nuclear industry has indicated that it expects to submit at least 20 combined license applications to the NRC during FY 2008 and FY 2009. Our budget was developed with the assumption that the first 13 of these applications will arrive in FY 2008. In addition to beginning the review of these 13 COL applications in FY 2008, the NRC expects to review three early site permit applications and two standard design certification applications. The NRC's FY 2007 appropriation, as approved by the House of Representatives in H.R. 5427, includes $133 million for new reactor licensing activities. Our preliminary estimate for new reactor licensing activities in FY 2008 is $230–$250 million. At this time the FY 2009 resource estimate for new reactor licensing activities is expected to remain relatively level with the FY 2008 resource estimate, or increase slightly depending on the timing and the number of new applications submitted for review.

RESPONSES BY LUIS A. REYES TO ADDITIONAL QUESTIONS FROM SENATOR JEFFORDS

Question 1. Several pending pieces of legislation include waste confidence provisions. In your testimony you state that the NRC would not object if Congress acted to deem that sufficient capacity would exist in a timely fashion to store nuclear waste at Yucca Mountain, or other proposed sites. Is it correct that the NRC has made this determination before in other cases, such as the proposed private fuel storage facility in Utah?

Response. The NRC made its current waste confidence determination by rule in 1990, and confirmed the rule in 1999. The determination, which is codified in 10 CFR 51.23, applies to licensing and license amendment determinations made with regard to reactors and initial licensing and license amendment determinations made with regard to independent spent fuel storage installations (ISFSIs). Therefore, it has been applied by the NRC to several licensing cases, including, for example, that for the ISFSI at the Humbolt Bay nuclear power plant. In the Private Fuel Storage (PFS) case, NRC cited the waste confidence rule in the final environmental impact statement and elsewhere, in considering whether spent fuel would remain at the PFS site indefinitely; in PFS, however, NRC did not need to rely on the waste confidence rule because utilities' contracts with PFS require them to take back their spent fuel before the PFS license is terminated.

NRC understands that several pending pieces of legislation would direct the NRC to deem, without further consideration, that sufficient capacity will be available in a timely manner to dispose of the spent fuel and high-level waste from the operation of new reactors and ISFSIs. As we stated in our response to Senator Bingaman's post-hearing question from the August 3, 2006, hearing before the Senate Committee on Energy and National Resources on "S. 2589, the Nuclear Fuel Management and Disposal Act," such legislation is consistent with the NRC's current position that it has confidence that spent fuel and high-level waste produced by nuclear facilities can be both safely disposed of and safely stored until a permanent geologic repository is available. Spent fuel is being managed safely today and the NRC has every expectation that it can be and will be managed safely in the future with at least the same level of protection. Therefore, given that Congress has the authority to impose limits on environmental reviews, and the Commission has confidence in the future safety of stored spent fuel, the NRC has no objection to such waste confidence provisions in pending legislation.

Question 2. If Congress acts to set waste confidence, I want to understand the effect on the Commission. The NRC has invested resources to make these decisions. If Congress acts to remove this NRC decision making responsibility, what is effect on NRC resources, personnel, and Commission's workload?

Response. If waste confidence were to be established by statute, the effect on the Commission's resources would depend upon whether there is any further need for the Commission to revisit its 1990 waste confidence findings. In 1999, the Commission stated that it would consider undertaking a comprehensive reevaluation of the waste confidence findings only when the impending repository development and regulatory activities run their course or if significant and pertinent unexpected events occur, raising substantial doubt about the continuing validity of the waste confidence findings. If Congress does not set waste confidence, this is a decision that the Commission could again address as it has before in 1984 and 1990. The agency has not budgeted resources to reevaluate its waste confidence decision. The resources needed for such an undertaking would likely be equivalent to those needed for a major rulemaking (approximately four full-time equivalent employees and $75,000 per year over a 2-year period).

Question 3. If Congress did not set waste confidence, is this a decision that the Commission could continue to make as it has before?

Response. If waste confidence were to be established by statute, the effect on the Commission's resources would depend upon whether there is any further need for the Commission to revisit its 1990 waste confidence findings. In 1999, the Commission stated that it would consider undertaking a comprehensive reevaluation of the waste confidence findings only when the impending repository development and regulatory activities run their course or if significant and pertinent unexpected events occur, raising substantial doubt about the continuing validity of the waste confidence findings. The resources needed for such an undertaking would likely be equivalent to those needed for a major rulemaking. If Congress does not set waste confidence, this is a decision that the Commission could again address as it has before in 1984 and 1990.

Question 4. I want to make certain I understood a point you made in your testimony. You stated that the NRC has reviewed the interim storage language in the 2007 Senate Energy and Water Appropriations bill. You also said that the existing regulatory infrastructure is sufficient to implement that language should it become law. So the rules don't need to be modified, but you would still need additional people, sufficient funds, and time to implement this change if it became law?

Response. The NRC has the trained staff, regulatory infrastructure, and guidance to review license applications for spent fuel stored away from reactors in an independent spent fuel storage installation (ISFSI). Currently, the NRC's approved budget for fiscal year 2007 does not provide the monetary resources or the necessary employee resources to support the technical review and adjudication of a large number of concurrent storage license applications as considered in H.R. 5427. Thus, a sudden influx of a large number of new applications for ISFSIs could not be handled without a supplemental appropriation for additional staff and resources. Additional time would also be necessary.

Question 5. Is it also the case that the NRC does not have capacity to evaluate commercial reprocessing plants and does not have an approved storage container for reprocessing waste?

Response. Yes, to conduct an efficient and effective licensing review of commercial reprocessing plants, the NRC would need to hire additional specialized staff and modify its regulations.

The NRC regulations that would apply to a reprocessing facility are the same regulations that were used for licensing reactors decades ago. They would not necessarily address all commercial reprocessing facility safety issues and, conversely, are likely to contain requirements that are not applicable to a reprocessing facility. Consequently, licensing of a commercial reprocessing facility under these regulations would present significant challenges to the applicant and to the NRC.

The NRC has a limited number of people who have experience in the licensing of reprocessing facilities, either with the NRC or based on previous work in industry. In addition, the NRC has recent applicable licensing experience with technologies that are similar to the types of recycling processes under consideration for Global Nuclear Energy Partnership (GNEP) (e.g., UREX+ or COEX processes). However, we still need additional expertise in several specialty fields in order to conduct an efficient review of these advanced technologies. For example, NRC needs chemical engineers with a detailed knowledge of reprocessing, actinide chemists, and nuclear engineers. The NRC has already started looking for this type of experience in making hiring decisions for open positions and have identified some strong candidates. In addition, the NRC has knowledge management efforts underway that will help transfer applicable knowledge from the experts we do have in these areas to the less experienced staff.

The NRC has not approved any storage containers for reprocessing waste. The NRC has approved storage containers for spent nuclear fuel and irradiated materials generated by operating nuclear power plants.

Response by Luis A. Reyes to an Additional Question from Senator Voinovich

Question. In his testimony, Mr. Sproat of DOE stated that he is highly confident that DOE will have a high-quality, docketable license application for Yucca Mountain repository submitted to the NRC no later than June 30, 2008. For the record, can you assure this Committee that the NRC is equally confident in meeting the statutory deadline for completing its licensing proceeding for Yucca Mountain?

Response. Provided adequate resources are available, NRC is highly confident that it can meet its statutory obligations concerning the length of time it has to review a license application. The licensing procedure's schedule, however, will rely heavily upon receiving a complete, high-quality application from DOE. Also, as in any license application review and associated hearings, unanticipated events could result in delays. For example, submission of additional information, changes to the license application, and the number and type of contentions admitted to the hearings could all impact the review and hearing schedule. A complete, high-quality application would minimize the impact of these types of issues on schedule and budget, and we would make every effort but there is no way to give assurance on how these issues will affect the ability for NRC to meet its statutory deadline.

STATEMENT OF ADMIRAL FRANK L. "SKIP" BOWMAN, U.S.N. (RETIRED), PRESIDENT AND CEO, NUCLEAR ENERGY INSTITUTE

Mr. Chairman, Ranking Member Carper, and members of the subcommittee, I am Admiral Frank L. "Skip" Bowman, U.S. Navy (retired). I serve as president and chief executive officer of the Nuclear Energy Institute. Thank you for this opportunity to express the nuclear energy industry's views on legislation to address the management of used nuclear fuel, and in particular the role of the Nuclear Regulatory Commission (NRC).

In his 2006 State of the Union address, President Bush affirmed the Nation's commitment to "safe, clean nuclear energy" as part of a diverse portfolio that will meet America's future electricity needs. A long-term commitment to nuclear energy will make the United States more energy independent and ensure the diversity of our energy sources. We appreciate the leadership of this subcommittee in continued strong oversight of the NRC and its key role in enacting the Energy Policy Act of 2005. This legislation encourages diversity of energy sources, including such emission-free sources of electricity as nuclear energy.

SUMMARY

I will focus my testimony on the following key issues:

- First, The Department of Energy (DOE) must make visible and measurable progress in implementing an integrated national used nuclear fuel management strategy. The Yucca Mountain, Nevada, repository is a critical component of any such integrated strategy. This progress will help ensure that the expanded use of nuclear energy will play a crucial role in our Nation's strategy for meeting growing electricity demand.
- Second, S. 2610 can play a key role in addressing the challenges facing the DOE and NRC on the Yucca Mountain project, as well as help set the stage for new nuclear plants.
- Third, Congress must take additional actions (beyond S. 2610) to support the removal of used fuel from commercial nuclear plant sites as soon as possible, together with steps to accelerate development of new technological approaches that would substantially benefit disposition strategies. In formulating this policy, the Administration and Congress must consider potential impacts on NRC in terms of resources and capability, and make sure they don't detract from the Agency's current effort in the new reactor licensing arena.

NUCLEAR ENERGY MUST PLAY A KEY ROLE IN OUR NATION'S ENERGY FUTURE

The Nation's energy portfolio must include clean, reliable and affordable energy sources available today, such as nuclear energy. Nuclear energy offers several unique advantages. It is the only expandable base load energy source that does not emit carbon or other greenhouse gases into the atmosphere during operation. Nuclear energy safely and reliably provides price stability for electricity customers as the prices for fossil fuels fluctuate. It also provides exciting new opportunities in areas such as hydrogen production and plug-in hybrid automobiles. Although our Nation must continue to employ a mix of fuel sources for generating electricity, we believe it is important that nuclear energy maintain at least its current 20 percent contribution to U.S. electricity production. Maintaining that level of production will require construction of a significant number of new nuclear plants beginning in the next decade. There is strong, bipartisan support for a continuing significant role for nuclear power. More than two thirds of the public supports keeping nuclear energy as a key component of our energy portfolio. Many in the environmental community recognize and endorse the role that nuclear energy can play in controlling greenhouse gas emissions.

Recently, a new coalition of organizations and individuals has been formed to educate the public on nuclear energy and participate in policy discussions on U.S. energy issues. The Clean and Safe Energy coalition—co-chaired by Greenpeace co-founder Patrick Moore and former Environmental Protection Agency Administrator and New Jersey Governor Christine Todd Whitman—includes business, environmental, labor, health and community leaders among its more than 200 members.

PROGRESS MUST BE MADE ON YUCCA MOUNTAIN

Although the industry shares the frustration of many members of Congress with the pace of progress on the Yucca Mountain repository program, we are encouraged by the leadership and management recently provided to the program by Energy Secretary Samuel Bodman, Deputy Secretary Clay Sell and new Director of the Office of Civilian Radioactive Waste Management Edward Sproat.

They are leading the transition from a purely scientific program, focused on site characterization and site approval at Yucca Mountain, to one that is preparing to enter a rigorous Nuclear Regulatory Commission licensing process. DOE is also adopting industry best practices to ensure that it will submit a high-quality application to the NRC. It plans to include in this application a revised surface facility design that will handle fuel in standardized multipurpose canisters. Using multipurpose transportation, aging and disposal (TAD) canisters in combination with associated surface facilities will reduce the need to handle used fuel at Yucca Mountain and increase safety. It is important that DOE complete these efforts, file a high-quality repository license application in a timely manner and, ultimately, complete the transition to a design, engineering and construction project.

The nuclear industry is encouraged by the ambitious schedule announced by the department on July 19 for submission of the license application by June 30, 2008, and the "best-achievable" construction schedule that could have the repository begin receipt of used fuel in March 2017. The industry encourages DOE to submit the application as soon as possible to facilitate an expeditious NRC review.

Although we welcome the department's determination to meet this "best-achievable" schedule, it is important to recognize that it depends on several factors, most of which are outside the department's direct control. These include:

- congressional appropriations consistent with administration requests;
- an NRC construction authorization decision consistent with the timelines contained in the Nuclear Waste Policy Act; NRC must be provided with the necessary resources and appropriate management focus to meet these timelines, while also considering license applications for new nuclear plants and potential fuel cycle facilities. We are confident that this Committee will provide the oversight and direction to see that this can be accomplished.
- the length and outcome of any derivative litigation;
- obtaining any necessary Federal or State authorizations or permits for the repository and the transportation system;
- the department's achieving a nuclear culture consistent with that required of any successful NRC licensee; and, critically,
- enactment of the Nuclear Fuel Management Disposal Act.

Failure to take legislative action will seriously jeopardize progress toward managing the country's used fuel. Delays in some cases will prevent the repository's operation by 2017.

S. 2610 SUPPORTS NUCLEAR POWER'S FUTURE ROLE IN OUR NATIONAL ENERGY STRATEGY

The industry strongly supports S. 2610, since it includes those provisions of the comprehensive legislative proposal submitted by the Administration that relate to issues within this committee's jurisdiction. These provisions should be enacted along with many of the additional provisions in S. 2589, which Chairman Inhofe introduced along with Chairman Domenici of the Energy and Natural Resources Committee. Industry representatives previously have testified in detail on the provisions of S. 2589, including land withdrawal, changes in the regulatory process and the budget treatment of the Nuclear Waste Fund. We also identified the need to address contract provisions related to used fuel for new nuclear plants.

Waste Confidence Is Affirmed

The Nation must be confident that policies are in place to ensure the safe, secure storage and disposal of used nuclear fuel byproducts. This waste confidence determination is reflected in NRC rules requiring an NRC finding of "waste confidence" to support various licensing actions. However, such an approach creates uncertainty

because NRC regulations and licensing decisions are subject to litigation, and the issue is one of public policy, not regulatory or technical determination.

Managing the Nation's used fuel is a firmly established Federal obligation and, as such, is a matter of broad national policy under the purview of the elected representatives of our country's people. There is solid scientific and technical justification to affirm waste confidence. In 2001, the National Academy of Sciences confirmed four decades of international scientific consensus that geologic disposal is the best method for managing used nuclear fuel. Congress approved a geologic disposal site at Yucca Mountain in 2002.

In the Energy Policy Act, Congress included provisions that encourage the construction of new nuclear power plants, demonstrating public policy confidence in the Nation's ability to manage used reactor fuel in the future. In addition, the Energy Department has safely operated a geologic disposal site for transuranic radioactive waste near Carlsbad, New Mexico, and 34 temporary dry-cask storage facilities for used nuclear fuel have been licensed at nuclear power plants. The first such facility has been operating since 1986. Congress should codify "waste confidence" as called for in S. 2589 so that the NRC need not address this broad public policy matter as a routine regulatory matter.

Artificial Constraints on Repository Operations Are Eliminated

Currently, there is an artificial limit of 70,000 metric tons (MT) on the amount of nuclear waste materials that can be accepted at Yucca Mountain. The Environmental Impact Statement for the project analyzed emplacement of up to 105,000 MT of commercial nuclear waste products in the repository. Additional scientific analyses suggest significantly higher capacity easily could be achieved with changes in the repository configuration that use only geology that already has been characterized and do not deviate from existing design parameters. Advanced nuclear fuel cycle technologies could provide significant additional capacity for disposing of waste products in Yucca Mountain.

Decisions on licensing and operation of a deep geologic repository at Yucca Mountain should be based on scientific and engineering considerations through DOE technical analyses and the NRC licensing process, not on artificial, political constraints. Given the decades of study and the billions of dollars invested in Yucca Mountain, it makes sense that we fully and safely utilize its full potential capacity, rather than developing multiple repositories when there is no technical reason to do so. S. 2610 will allow the Nation to do just that by lifting the artificial 70,000 MT capacity limit.

Clarity and Stability in the Licensing Process Are Enhanced

The NRC repository licensing process should be restructured to ensure that the proceedings are managed effectively, as called for in the legislation. First, there must be a reasonable, but finite, schedule for review of the authority to "receive and possess" fuel that would follow approval of the construction license. This would be consistent with an established schedule for the initial review of the construction license application and could avoid dilatory procedural challenges that would undermine the Government's ability to meet its contractual obligations and avoid the significant costs of delay.

Second, clarification must be provided as to what activities are authorized to develop used fuel management infrastructure prior to the NRC's granting a construction license, including the construction of a rail line to connect the Yucca Mountain site with the national rail network. Regulatory authority for the transportation system needs to be clarified as well.

Third, the hearing process for the authorization to receive and possess fuel should be simplified to provide for clear and concise decision making.

This disciplined approach to the licensing process is wholly consistent with the regulatory approach developed over the past several years by the NRC to license other nuclear facilities.

Environmental Reviews Are Appropriately Focused

The legislation takes into account the unprecedented scope and duration of environmental reviews that will accompany the construction licensing process for the Yucca Mountain facility. It appropriately separates those non-nuclear issues related to infrastructure support activities from repository licensing and operations.

The legislation also recognizes the stringent standards that will apply to the repository with respect to release of radioactive materials and the nature of the materials involved. These standards preclude the need to apply additional measures to protect public health and the environment. In effect, no compelling reason exists for imposing additional review requirements under the Resource Conservation and Recovery Act.

Finally, the legislation seeks to avoid the issuance of duplicative air-quality permits; it provides exclusive jurisdiction on this issue to the Environmental Protection Agency. It also affirms that the project is in the public interest and directs that the State of Nevada consider water permits on that basis.

ADDITIONAL ACTIONS BEYOND S. 2610 ARE NEEDED

In addition to S. 2610's provisions, we encourage Congress to direct DOE to incorporate features into its repository development plans that maintain flexibility for future generations to make informed decisions based on operational experience, changing energy economics and technological developments. It should be made clear that it is the intent that the repository design retains the ability to monitor and, if needed or desired, retrieve the used fuel.

The nuclear energy industry supports enhancements to the Yucca Mountain repository that would provide greater long-term assurance of safety and permit DOE to apply innovative technology at the repository as it is developed. These enhancements include:

• extensive monitoring of the used nuclear fuel placed in the repository and its effects on the surrounding geology for 300 or more years;

• the ability to retrieve used nuclear fuel from the facility for this extended period; and

• periodic future reviews of updates to the repository license that take into account monitoring results and ensure that the facility is operating as designed.

DOE already has committed to facilitate the use of these elements in its repository planning. According to the department's final Environmental Impact Statement, for a period of 50 to 300 years, the Federal Government will "collect, evaluate and report on data" to assess the performance of the repository and the ability to retrieve the used fuel within the facility, if desired. In addition to monitoring material within the facility, DOE will conduct tests and analyses to ensure that the repository is constructed and operated according to strict guidelines. Although DOE is pursuing these elements, congressional direction on the proposed enhancements would provide greater certainty on the scientific and regulatory oversight of long-term repository operation and the condition of the material stored there.

Doing so would require no modification to the existing Federal statutory or regulatory framework. The Energy Department could include these enhancements as part of its "receive and possess" application and the commitment to complete them should be incorporated as a condition of the NRC license.

This direction will offer greater assurance to the public that long-term stewardship of used fuel at Yucca Mountain will be carefully monitored throughout repository operation. It also would allow DOE to take advantage of future technological innovations to improve the repository or provide for the potential reuse of the energy that remains in the fuel.

DOE SHOULD MOVE USED NUCLEAR FUEL FROM REACTOR SITES AS SOON AS POSSIBLE

Let me now turn to the issue of potential interim storage of used nuclear fuel prior to, or in parallel with, licensing and operation of Yucca Mountain. A number of proposals have been put forward in the past several months on this issue including:

• Section 313 of the fiscal 2007 Energy and Water Development Appropriations Act, as reported by the Senate Energy and Natural Resources Committee, that would establish State or regional storage sites;

• report language included in the House-passed version of this legislation directing the secretary of energy to develop plans for interim storage potentially associated with nuclear fuel recycling facilities;

• S. 2099 introduced by Senator Reid and others that would indefinitely retain used nuclear fuel at reactor sites; and

• a Funding Availability Opportunity solicitation from DOE for localities interested in hosting recycling facilities that would include interim storage of used nuclear fuel.

The industry's top priority is for the Federal Government to meet its statutory and contractual obligation to move used fuel away from operating and decommissioned reactor sites. The Government already is 8 years in arrears in meeting this obligation, and it will be at least another decade before the repository is completed. That failure is the subject of more than 60 lawsuits. Three of these suits, representing only a fraction of the reactor sites, have resulted in settlements or judgments against the Federal Government totaling $340 million for costs incurred.

Further delays in Federal receipt and movement of used nuclear fuel and defense waste products could cost taxpayers more than $1 billion per year in life-cycle costs

for defense waste sites, operating costs at utilities and Yucca Mountain fixed costs, exclusive of litigation damages already incurred, according to DOE.

While DOE moves forward to license, construct and operate the Yucca Mountain repository, the Government must take title to used fuel and move it to secure Federal facilities as soon as practicable. The industry believes that consolidation and storage of used nuclear fuel on an interim basis can provide significant benefits in cost, system integration, synergy with recycling/reprocessing technology development and instill public confidence in the Federal waste management program.

CONGRESS SHOULD ENHANCE THE GOVERNMENT'S USED FUEL STEWARDSHIP

In order to fully realize the benefits of nuclear power, and to address legitimate questions in the Government's used fuel stewardship, the United States must have a credible, long-term program to manage used nuclear fuel. This program should integrate a number of essential components, including:

1. the centralized disposal facility at Yucca Mountain, NV;
2. advanced proliferation-proof, fuel processing and fuel fabrication facilities and advanced reactors designed to extract the maximum possible energy from used nuclear fuel, and reduce the radiotoxicity and volume of the waste by-products requiring permanent isolation in the repository, and
3. interim storage facilities until the centralized disposal facility is operational, colocated with the advanced fuel processing and recycling facilities.

Used nuclear fuel is stored safely today at nuclear plant sites, either in pool storage or in dry casks.

That said, however, it is absolutely essential to public and State policymaker confidence that the Federal Government identify and develop sites for centralized interim storage, ideally linked to future reprocessing facilities, and begin the process of moving used nuclear fuel to these interim storage facilities. Further delays in Federal receipt and movement of used nuclear fuel and defense waste products could cost taxpayers over $1 billion per year.

The industry believes that consolidation and storage of used nuclear fuel on a temporary basis can provide significant benefits in cost, system integration, synergy with recycling/reprocessing technology development and confidence in the Federal waste management program.

The nuclear energy industry believes that the best approach would be for the Federal Government to begin to move fuel to Nevada now, close to the planned repository.

In addition, we urge Congress to evaluate alternative interim storage proposals. We recommend the following principles:

- Minimize the number of interim storage sites to reduce costs and maximize efficiencies of consolidation.
- Provide host site benefits, ideally linking interim storage to recycling/reprocessing technology development, as an incentive for voluntary participation.
- Recognize that while the Nuclear Waste fund could be used to pay for this interim storage, it should not be used to develop the complementary technology development.
- NRC must be provided with the necessary resources and appropriate management focus.

It appears to us that one or two interim storage sites that provide benefits desired by the host State and community are the appropriate approach. We are encouraged that DOE has advised Congress, in its solicitation for prospective sites for nuclear fuel recycling facilities, that some interim storage of used nuclear fuel will be necessary. Several communities have expressed initial interest in participating in such a project. We believe Congress should work with DOE, industry and potential host sites to determine the steps needed to facilitate the movement of used fuel from utility sites and incorporate appropriate provisions into the proposed legislation.

The industry does not believe that the approach suggested in S. 2099 by any measure meets the Government's statutory obligation to dispose of used nuclear fuel. In reality, S. 2099 provides no benefit; it dictates immediate movement of all used fuel at reactor sites into dry storage a move that could add as much as $800 million a year over 5 years to the cost of producing nuclear energy. In effect, no used fuel moves off nuclear plant sites.

NEW CONTRACTS FOR DISPOSAL OF SPENT FUEL ARE REQUIRED

As utilities prepare to license and build new nuclear power plants, it is essential that appropriate new contracts for disposal of spent nuclear fuel between utilities and DOE be in place, reflecting developments since these contracts were originally drafted in the 1980s. For example, the 1998 acceptance date in the existing con-

tracts must be revised in contracts executed for new plants to account for the future dates of operation of new plants.

CONGRESS SHOULD LEGISLATE AN APPROPRIATE DISPOSAL STANDARD FOR YUCCA MOUNTAIN

The previously issued EPA disposal standard of 10,000 years was appropriately protective of public health and safety and was consistent with other hazardous material regulation in the United States. This standard was remanded by court finding on a technicality. Congress should legislate the appropriate 10,000 year standard.

USED NUCLEAR FUEL RECYCLING

Finally, let me address the Global Nuclear Energy Partnership program. The nuclear energy industry strongly supports research and development of advanced fuel cycle technologies incorporated in the Advanced Fuel Cycle Initiative (AFCI). In anticipation of a major expansion of nuclear power in the United States and globally, it is appropriate to accelerate activities in this program. However, regardless of the success of AFCI technology, a repository will be necessary to handle defense wastes and commercial used nuclear fuel and waste byproducts. This will be the case regardless of any new fuel cycle ultimately developed.

President Bush has presented a compelling vision for a global nuclear renaissance through the Global Nuclear Energy Partnership (GNEP). This initiative provides an important framework to satisfy U.S. and world needs for an abundant source of clean, safe nuclear energy while addressing challenges related to fuel supply, long-term radioactive waste management and proliferation concerns. As recently introduced by DOE, it may be possible that currently available technologies could be used creatively to jump-start the development of the needed advanced nuclear fuel cycle technologies.

We appreciate the steps that DOE has taken to solicit industry views on the timing, direction and defining roles of interested parties in GNEP. The expressions of interest that DOE received last week will help the department and Congress make more informed decisions on the best way to proceed with research and development of these technologies. NEI, in its expression of interest, said it fully supports the technologies underlying GNEP and encourages the department to proceed with research, development and deployment of the consolidated fuel treatment center and the advanced burner reactor.

We recognize that Congress has important questions regarding this program. In particular, special attention needs to be given to how facilities would be licensed and the potential impact this could have on the NRC's resources for major licensing actions on new plants and Yucca Mountain in parallel time periods.

DOE's near-term focus for GNEP is to determine, by 2008, how to proceed with demonstration of advanced recycling technologies and other technological challenges. Consequently, the industry fully supports increased funding for AFCI in fiscal 2007. However, monies collected for the Nuclear Waste Fund should not be used, and it must be recognized that neither AFCI nor GNEP reduces the near-term imperative to develop the Yucca Mountain repository.

CONCLUSION

We must never lose sight of the Federal Government's statutory responsibility for civilian used nuclear fuel disposal, as stated by Congress in the Atomic Energy Act of 1954 and the Nuclear Waste Policy Act of 1982. The industry fully supports the fundamental need for a repository so used nuclear fuel and the byproducts of the Nation's nuclear weapons program are safely and securely managed in a specially designed, underground facility. World-class science has demonstrated that Yucca Mountain is an eminently suitable site for such a facility.

A viable used fuel management strategy is necessary to retain long-term public confidence in operating existing nuclear power plants and to build new nuclear power plants to meet our Nation's growing electricity needs and fuel our economic growth. The public confidence necessary to support construction of new nuclear plants is linked to successful implementation of an integrated national used fuel policy, which includes a continued commitment for the long-term disposition of used nuclear fuel. This requires a commitment from the Administration, Congress and other stakeholders to ensure that DOE makes an effective transition from a scientific program to a licensing and construction program, with the same commitment to safety. New waste management approaches, including interim storage and nuclear fuel recycling, are consistent with timely development of Yucca Mountain.

Enactment of S. 2610 is a critical prerequisite to implementing our national policy for used fuel management.

Additional Costs of S2099
Above and beyond what industry already plans on spending on dry cask storage
2006-2011

Total Additional Dry Storage Systems Required	4575	$3,300,000,000
New Transfer Casks Required	24	$14,400,000
New ISFSIs required but not now planned before 2011	24	$480,000,000
Loading Labor		$46,000,000
Operating costs of 24 additional ISFSIs		$36,000,000
License Transfer costs at 36 pre-2011 ISFSIs		$28,350,000
Total 2006 - 2011		$3,904,750,000
Cost per year for first 5 years		**$ 780,950,000 or ~ $800 million/yr.**

STATEMENT OF VICTOR GILINSKY, INDEPENDENT ENERGY CONSULTANT

Mr. Chairman, Members of the Committee:

Thank you for inviting me to comment on the bills before you that deal with spent fuel. I've been involved with nuclear waste issues from 1971 when I was on the staff of the Atomic Energy Commission. I later served two terms on the Nuclear Regulatory Commission—nominated first by President Ford and later by President Carter. Since then I've been an independent consultant. In the past few years I have assisted the State of Nevada on Yucca Mountain issues.

I would like to address briefly three NRC-related items—interim spent fuel storage, the NRC's Waste Confidence Rule, and the Administration's Global Nuclear Energy Partnership:

INTERIM STORAGE

No matter what you think about Yucca Mountain's future, it seems inescapable that we are going to need a lot of spent fuel storage. The generating companies are preparing themselves by building installations at their sites to store spent fuel in dry casks. The technology is straightforward and the licensing of these sites does not appear to strain the NRC very much.

It would be good to also have regional storage sites for overflow capacity, to collect the spent fuel from shut down reactors, and eventually to collect all the spent fuel under a dedicated storage management. Senator Domenici's bill allows for such central facilities.

In the short run, for safety and security, we should move spent fuel from reactor pools into dry casks as soon as it cools sufficiently. Senator Reid's bill addresses this point.

All this would make sense even if you thought Yucca Mountain was on track. Experience, however, suggests it isn't. DOE's projected opening date has slipped 7 years since Congress voted on the Yucca Mountain Resolution four years ago. Last week the Interior Secretary vetoed the Private Fuel Storage facility in Utah in part because he concluded it was not prudent to rely on Yucca Mountain opening.

WASTE CONFIDENCE

This lead directly to the second item—the NRC's Waste Confidence Rule.

The current version of the rule, adopted in 1990, says the NRC is confident that a geologic repository will open by 2025. The function of the rule was to protects reactor licensing from challenges based on the waste issue, although as we approach 2025 that role becomes more doubtful.

There is a more serious problem. In 1990 the NRC said if Yucca Mountain failed to get licensed there would be time to find another site before 2025. Today that claim is no longer tenable. So, in effect, the rule now says NRC is confident Yucca Mountain will be licensed. In other words, NRC is prejudging the case.

Nevada petitioned NRC to eliminate the date, assuming it can do so responsibly. The Commission refused to act, even though a change would also benefit its power reactor licensees. In any event, Nevada appealed, and the case is being argued today before the Court of Appeals.

Some of the bill before you would have Congress make the change for the NRC. Because any such change implies a safety judgment, I believe the more responsible course is for the NRC itself to do it through rulemaking.

GLOBAL NUCLEAR ENERGY PARTNERSHIP

My third item concerns GNEP, the Administration's grand plan for developing technology to transform the future of nuclear power world-wide. It is not likely to demand much in the way of NRC resources for a long time.

That may change, however, if DOE pursues its latest idea to "fast track" the GNEP demonstration plants. DOE acts as if it is sure of success, but I have to say I don't know of any example of DOE developing a major technology to full scale and then transferring it successfully to industry. GNEP contains concepts that might be useful if they worked, but they are a long way from being practicable.

GNEP reminds me of the AEC's fast breeder program of the 1960s. In its eagerness to jump to the next stage the Commission neglected basic technical issues that were vital to nuclear power's success in the short run. That neglect led to the problems of the 1970s, and was a significant contributor to the Three Mile Island accident.

The nuclear industry learned from the accident to focus on running its plants safely and economically. It also learned that useful technology advances in careful incremental steps. DOE and the national laboratories haven't learned that lesson and are impatient to jump ahead to advanced reprocessing and fast breeders. At a minimum, DOE should have to pass NRC safety licensing for any substantial demonstration facilities. That will slow them down, but it will also help to keep DOE's feet on the ground.

RESPONSE BY VICTOR GILINSKY TO AN ADDITIONAL QUESTION FROM SENATOR INHOFE

Question. Would it not be more cost-effective and practical for the waste to be stored at one location in a retrievable manner for both reprocessing, reuse and final disposal?

Response. I think it would be cost-effective to store spent fuel in central locations. In any such calculations we have to take account of the existing dry cask storage facilities and those that are getting built. In any case, I support creating some central capacity to provide overflow capacity for the operating reactor, to collect storage from the shut down reactors, and eventually to collect the spent fuel under management that is solely concerned with waste storage. We would have been well-served if we had built central surface, or near-surface, spent fuel storage facilities some time ago. I have attached a speech I gave in 1983 when I was an NRC commissioner making this very point. I would be grateful if you would include it in the hearing record because it shows two things: that the problem is not a new one and that in the past important sectors of the nuclear community adopted ideological positions that undermined practical solutions to the waste problem. In the end the ideological goals turned out to be unrealistic.

I mention this last point because it is happening again in the form of the Global Nuclear Energy Partnership. I believe in your opening statement you expressed concern that GNEP would short-change important practical activities in support of current nuclear power plants. This brings me to the last part of your question, which mentions collocating storage with reprocessing, reuse, and final disposal.

Reprocessing and reuse make no economic sense for the foreseeable future. That is the clear message from the nuclear industry. And of course putting plutonium into commercial channels poses security risks. As for final disposal, the only site under consideration is Yucca Mountain. On the basis of my familiarity with the issues as a consultant for Nevada it is evident this is a poor site that could not pass a reasonable siting evaluation. The Energy Department is trying to muscle its way through despite this, but it remains an iffy proposition. In sum, at this point these three activities—reprocessing, reuse, and Yucca Mountain—are dubious propositions and it doesn't make sense to tie the practical requirement for spent fuel storage to these three bad ideas.

RESPONSE BY VICTOR GILINSKY TO AN ADDITIONAL QUESTION FROM SENATOR VOINOVICH

Question. Mr. Gilinsky, it appears from your testimony that you are advocating having dry cask storage at each nuclear power plant regardless of the Yucca Mountain's future. I am not sure if I understand your reasoning for this, especially when you agree with the other witnesses that spent fuels are safe in the spent fuel pools. Who pays for these dry casks? Won't the rate payers ultimately have to pay for them in addition to what they have paid already for Yucca Mountain?

Response. First, nearly all the nuclear operators are already building dry cask storage facilities on or near their reactor sites. Even if Yucca Mountain were more or less on schedule, it would take many years to collect the spent fuel and most of the reactor operators would have exceeded their spent fuel pool limits.

Dry cask storage is an option after the spent fuel has cooled for several years. At that point however it has many advantages both in terms of safety and security, as I think is intuitively obvious. The basic point is that the dry cask protection is passive and doesn't depend on hydraulic and electrical systems operating as do spent fuel pools. A recent National Academy of Science study stated that "Dry cask storage has intrinsic security advantages over spent fuel pool storage . . ."

The point I made in my testimony was that the Federal Government should encourage operators to move their spent fuel into dry casks as early as possible rather than do so only when they are out of spent fuel pool capacity. The industry resists this because of the expense. I think the safety and security advantages to the public are substantial enough to warrant the expense, which as you point out will ultimately be paid by the customer. But then the customer gets the benefit. I don't see that these safety and security arguments are affected by what has been spent on Yucca Mountain. How that money was used by the Energy Department is an important but separate issue.

Remarks by Victor Gilinsky
Commissioner, U.S. Nuclear Regulatory Commission
before the
Waste Management '83 Symposium
Tucson, Arizona
February 28, 1983

THE FIRST STEP IN SOLVING THE NUCLEAR WASTE PROBLEM: PROVIDING ADEQUATE SPENT FUEL STORAGE

The nuclear waste problem has become almost synonymous with the problem of providing a repository for permanently isolating the highly-radioactive products of power reactor operation. That, indeed, is the main problem addressed by the recently enacted Nuclear Waste Policy Act of 1982, and it is the waste problem on which the Nuclear Regulatory Commission has concentrated most of its attention. You will hear a good deal more about these subjects during this meeting and I will only touch on them here.

I would like, instead, to use this occasion to take up with you a question which is preliminary to permanent waste isolation, one which is easier to deal with, but which has, at the same time, great practical importance. That question is: What are we going to do in the meantime about the spent fuel that is piling up at power plants around the country? The storage pools at the plants are filling up and there is, at this point, no other place for the spent fuel to go.

It is instructive to start with a look at the history of the subject because, among other things, it tells us something about the effect of putting all our waste eggs in one basket.

Of course, there wasn't supposed to be a spent fuel storage problem. The original idea was that spent uranium fuel would be reprocessed, a year or so after it was discharged, to extract plutonium formed during irradiation. The plutonium in turn was to fuel a new generation of reactors -- fast breeders. So strong was the belief in this breeder-dominated future that the current generation of U.S. reactors was designed with only enough spent fuel storage capacity for a few years of operation. (By contrast, Canadian reactors were provided with up to 20 years of storage capacity.)

The American utilities were happy with this arrangement because it kept them out of the waste storage business. However, a number of problems were obscured by the general optimism surrounding nuclear power.

First, there were no breeder reactors to take the plutonium. Second, there was no commercial reprocessing. Two small reprocessing plants were failures and a larger plant, at the Barnwell facility in South Carolina, was caught up in a new government safety requirement that prohibited the

transportation of liquid wastes. This meant that Barnwell would have to add a waste solidification plant, thereby doubling the overall cost. Such a plant was never built. Third, the government was getting nowhere in providing a repository to accept the highly-radioactive waste for permanent storage.

Then, in October 1976, for international security reasons, President Ford decided that commercial reprocessing should not proceed until we were confident we could prevent diversion of commercial plutonium to bomb use. To keep our domestic policy in line with our international policy, he decided against a government subsidy for Barnwell's waste solidification facility. This effectively put an end to commercial reprocessing in the United States.

By 1977 it was clear that the nuclear waste storage problem had become a spent fuel storage problem, but the utilities still thought they could count on the federal government. Indeed, in 1977, the Department of Energy announced that it planned to accept spent fuel for storage at future government central storage facilities.

But the proposed legislation was never enacted and in 1981, a new Administration withdrew the 1977 promise and left the utilities to their own devices. (The new waste legislation

contemplates government storage for only a tiny fraction of the projected spent fuel.)

In these circumstances it is natural to ask: Can plants expand their individual storage capacities sufficiently rapidly over the next few years to avoid curtailing reactor operation? And, to what extent can the industry count on the government's plans for permanent storage for the more distant future?

SPENT FUEL STORAGE AT REACTOR SITES

Realizing that they would have to provide for themselves, most utilities have found ways to expand spent fuel pool capacity, principally by installing new racks which permit closer spacing of spent fuel assemblies. This method, when fully exploited, usually allows about a three-fold increase in storage capacity. Just about every U.S. nuclear plant has reracked, some of them three and four times. Out of 97 applications for reracking, 84 have been approved so far by the Nuclear Regulatory Commission. In addition, two utilities that had run out of space at one reactor received permission to ship spent fuel to another reactor in their system.

The utilities have been able to exercise sufficient ingenuity and the NRC has been able to review and approve

applications for expansions sufficiently quickly, that no power plant has had to curtail operation because of inadequate spent fuel storage capacity.

At times this has meant dipping into the plant's full core reserve -- the storage capacity maintained to permit emptying the entire reactor core if necessary for inspection or repairs. Maintaining such a reserve is obviously good practice, but it is not an NRC safety requirement.

In any case, through application of these measures, almost all plants will get by until at least 1990.

NEW TECHNIQUES: ROD CONSOLIDATION AND DRY CASKS

To go beyond that, however, will require new storage techniques or construction of new facilities. In order of estimated cost, these include rod consolidation, dry cask storage, and construction of new spent fuel pools outside the reactor.

Rod consolidation involves dismantling or cutting apart the fuel assembly -- which in a pressurized water reactor contains two to three hundred fuel rods -- and putting the fuel rods closer together in about half the original space. The cost is relatively modest. However, this process involves a good deal of mechanical work on the fuel

underwater in the spent fuel pool, and reliability and safety need to be proved. Maine Yankee has submitted an application to NRC for permission to consolidate spent fuel, and several other utilities are considering it.

More expensive, but still cheaper than building a new pool, is putting spent fuel, which has cooled for 5 years or more, in large dry casks. A typical cask might hold 10 tons of spent fuel, weigh close to 100 tons, and cost about one million dollars. Cask capacity could be roughly doubled if the fuel were first consolidated. Ideally, such casks would also meet transportation requirements. Then, once the spent fuel was sealed inside the cask, it would not need to be opened before it reached a repository for permanent storage. In the meantime, the cask could remain at the reactor site or at some interim location. We have received an application from the Virginia Electric Power Company for such a storage scheme at Surry.

I am especially optimistic about this approach to our storage problems at reactors. If approved and adopted, it would essentially solve the problem of how to store spent fuel safely at reactor sites so as to avoid interrupting reactor operations. So far as I can tell, there would then be no practical limit to the amount of spent fuel that could be stored at most reactor sites.

LONG TERM WASTE DISPOSAL

.. is intended, of course, that the government will at some point accept the waste for permanent storage in a federal repository. The process by which this is to happen is covered in the new waste legislation which lays out a Congressionally-mandated timetable.

The trouble with relying entirely on this schedule is that the government's record in this field is not a good one. You are no doubt familiar with the plan in the 1960's for a repository in underground salt formations which was switched in the early 1970's to a plan for a surface repository, which in turn was abandoned in the next administration in favor of a return to the underground approach. Since then, the details have varied from administration to administration with the result that we are still not in sight of a repository.

Some progress has been made. The first, procedural, part of the NRC's regulations on repository licensing was published in final form in February, 1981. The other part, the set of technical performance standards to be met by the repository, was published for comment in July, 1981, and is now being put in final form by the Commission. The repository design has to be approved by the NRC from the point of view of public health and safety, and protection of the environment.

NRC requirements must be consistent with overall standards set by the Environmental Protection Agency.

The Department of Energy is of course charged by law with developing the needed technology and building a repository. Our rule calls for a detailed study of each site, including use of underground exploration. A minimum of three sites, including at least two kinds of underground media, must be studied. DOE intends to do this in basalt at Hanford, Washington; in tuff at the weapon test site in Nevada; and in salt at a location yet to be picked. DOE expects to sink shafts at these three sites in 1983 or 1984, and to select a repository location by 1987 or 1988. The schedule calls for a construction authorization by about 1990 and a repository ready for business in the late 1990's.

The new legislation essentially confirms the current DOE schedule for the first repository and sets up a mechanism for resolving state-federal differences over the placement of a repository. Needless to say, no state is particularly enthusiastic over the prospect of hosting such a repository. The states, having had some unpleasant experiences, simply don't trust the federal government on this issue.

Even if these plans are realized, it would take some years for a repository to absorb the spent fuel in temporary reactor storage. So, for at least the next twenty years,

the nuclear waste problem is the problem of where to store the spent fuel. The cumulative amount, to the year 2000, is estimated by DOE to be about 70,000 tons, or nearly ten times the amount already discharged. A typical reactor, by the way, discharges about 30 tons of fuel a year, so the hundred or more reactors expected to operate twenty years from now would add over 3000 tons per year to the DOE total.

In planning for the interim, how much confidence can we have in the government's plans for permanent storage of nuclear waste? Or, how long do we expect the spent fuel to remain in temporary storage?

I've had to give these questions a good deal of thought recently because the NRC Commissioners were asked by the Court of Appeals, in effect, whether we are confident that spent fuel will be removed from reactor sites by the expiration of their operating licenses?

The Commission is in the process of providing the Court with an answer. Let me tell you what I think.

Much as I hope that current plans will work out, there have been too many failures and delays in federal nuclear waste planning for me to be confident of any schedule. The recent legislation helps provide a mechanism for resolving state-federal disputes in a reasonable time. But we still

have a long way to go. Public attitudes on this subject are volatile, and many political accommodations remain to be reached. For example, if a State vetoes the President's repository site selection, both houses of Congress would have to override it to continue with that site. My conclusion is that we had better plan on providing interim spent fuel storage for several decades.

WHAT ABOUT THE INTERIM?

We have seen that there is essentially no practical limit to the amount of spent fuel that could be stored at most reactor sites. This doesn't mean, however, that it would be a good idea to leave it there, especially after the expiration of the site's operating license. The utilities are in the power business, not in the waste storage business, and we cannot depend on all of them to ensure adequate protection of the spent fuel when their sites are no longer producing power. Moreover, leaving spent fuel in a reactor storage pool after final shutdown complicates cleanup and decontamination.

I would say that it is better not to retain the spent fuel even at an operating reactor if there is a reasonable alternative. There are already enough things to distract station managers from their principal responsibility -- the safe and reliable operation of the reactor.

From the point of view of health and safety, I would prefer that the spent fuel be collected from the reactor sites, probably in dry storage casks, and stored at a central facility, where it would get better supervision and where it would not interfere with reactor operation.

The new legislation does contain some provisions for spent fuel storage away from reactors -- but only for about 3 percent of the expected inventory in the year 2000. This is a kind of "last resort" storage; I would make provision for central storage of the bulk of the spent fuel.

The argument is made that if such an interim storage facility is seen to be able to handle spent fuel storage for some time, all the steam will go out of the effort to build a federal repository for permanent storage. But such an observation could be made as well about extended storage at reactor sites. Another factor working against a central spent fuel storage facility is the strong opposition to moving spent fuel around and a consequent inclination to put this off as long as possible. Finally, no one seems to want to host a site for such a central storage location, any more than they want to host a site for a permanent repository. What worries people most, I think, is that waste dumps of all sorts are often neglected, and they fear this is also likely to be the case for nuclear waste, particularly in view of the frequent changes in policy in this field.

Which brings me to the latest policy switch that affects the provision of adequate spent fuel storage -- the government's renewed commitment to reprocessing and its encouragement of the commercial use of plutonium fuel in place of uranium. This amounts to a reversion to the policy of the 1960's.

REPROCESSING

Whatever may have been the case before, reprocessing no longer makes any commercial sense. Given the high cost of reprocessing, plutonium can only compete with uranium when uranium becomes very expensive. But there is much more uranium than anyone thought years ago, and the number of reactors expected to use it is much diminished. As a consequence, the price of uranium has in fact been falling. So much so, that Congress has talked about limiting imports. No commercial reprocessing plant will operate without massive federal subsidies.

The Administration's embrace of reprocessing complicates the perfectly straightforward problems of providing for spent fuel storage. For example, the Administration withdrew support for an interim storage facility because it "would detract from efforts to stimulate commercial reprocessing."

DOE insists that reprocessing is the solution to the spent fuel storage problem. They are talking about commercial reprocessing being available as early as 1992, even though they must know this can't happen because the subsidies required are not going to be forthcoming. All this is bound to introduce confusion in spent fuel storage planning by utilities.

Entangling spent fuel storage with reprocessing is how we got into trouble in the first place. We allowed the apparent inevitability of fast breeders to dictate the size of spent fuel pools in light water reactors. This time around, let's not permit spent fuel storage to be hostage to grandiose nuclear schemes. Whatever else we do, let's make sure we have adequate spent fuel storage.

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