ENERGY AND WATER, AND RELATED AGENCIES APPROPRIATIONS FOR FISCAL YEAR 2007

THURSDAY, MARCH 2, 2006

U.S. SENATE,
SUBCOMMITTEE OF THE COMMITTEE ON APPROPRIATIONS,
Washington, DC.

The subcommittee met at 2:33 p.m., in room SD–124, Dirksen Senate Office Building, Hon. Pete V. Domenici (chairman) presiding.

Present: Senators Domenici, Craig, Allard, and Murray.

DEPARTMENT OF ENERGY

STATEMENT OF HON. CLAY SELL, DEPUTY SECRETARY

OPENING STATEMENT OF SENATOR PETE V. DOMENICI

Senator DOMENICI. The hearing will please come to order.

Senator Reid has indicated that I should start. He may or may not be able to come, but we're going to proceed.

Good morning to you, Mr. Secretary.

First of all, as many of you may know, Clay is returning to this subcommittee, where he served as clerk for 4 years. I'm not sure that he wanted me to brag or comment about that, but it's a reality, so we might as well say it. I'm very pleased to have you here today, and to have you where you are. I'm sure you're going to do an excellent job in this very difficult arena. And I compliment you on the subject matter that you're going to present to us today.

This one of many of the President's new programs to break America's dependence on foreign oil and build America's competitive edge. And DOE is the focal point for these initiatives.

Good afternoon, Senator Craig.

First, I commend the Secretary and the Deputy Secretary for setting forth a comprehensive global nuclear strategy that promotes nuclear nonproliferation, and the goals of that, and helps to resolve our nuclear waste issues at the same time.

In the 1970's, the United States decided to abandon its leadership on nuclear recycling and let the rest of the world pass us by. With the creation of this new global nuclear energy program, we're going to get back into the ball game.

Now, it's not so easy to play catch-up from such a far long distance behind. It means you've got a lot of hard work. It means you've got to have a big vision. It means you've got to be willing to put up some resources. And then you've got to decide that what

you're trying to do is really worth it, that it has the potential for solving some big, big problems in the future.

So, based on the current projections, global energy demand is expected to double by the year 2050. We must act now to ensure that we have a reliable energy source, without increasing air pollution and without increasing greenhouse gases.

Passage of the Energy bill last year created a new future for nuclear power in this country, and it's interesting to note that the rest of the world is aware of the same thing we are aware of. We finally changed our policy, the rest of the world has finally decided to change their modus operandi, and they are also moving rather quickly into nuclear power reactors as source of energy for their countries. And that's China and many others, Larry, as we know.

In the year 2006 Energy Outlook, the Energy Information Agency has included in its estimates, believe it or not, a growth in nuclear power as part of the domestic energy picture. Now, that's a simple statement to make. And for many, it doesn't mean much. But when the Energy Information Agency looks out there and assesses what's going on, they usually come up with some pretty objective findings. And they have made a decision, a determination that nuclear power is going to come onboard in the United States by way of nuclear power plants. With the GNEP, we began to close the cycle on nuclear waste in ways that prevent proliferation and reduce both the volume and the toxicity of waste. By recycling of spent nuclear fuel, we can reuse the uranium, which is 96 percent of the spent fuel. We can separate the most toxic radioactive material to be burned in advanced burner reactors.

By reusing the fuel and burning the transuranic material, we can reduce the amount of waste that would be placed in a Yucca Mountain by 100 times. In other words, a Yucca Mountain will hold the waste from 100 times as much nuclear power as it will today, putting the spent fuel rods in, as we would put them in under current law and current policy.

So, I am pleased that President has focused on the importance of solving the energy needs. I don't want to lose sight of the importance of implementing the Energy Policy Act, which contains many important incentives that will support the deployment of clean coal technology, advanced nuclear power plants, biomass, and other renewable projects.

Mr. Secretary, it's my pleasure to welcome you back, and then, after yielding to Senator Craig, I'd ask you to summarize your statement, and it'll be made a part of the record.

Senator Craig.

STATEMENT OF SENATOR LARRY E. CRAIG

Senator CRAIG. Well, Mr. Chairman, thank you very much. Clay, welcome before the committee.

I'm sitting here listening to you, Mr. Chairman, and saying, gee whiz, a year ago, this time, we didn't know if we were going to get an Energy bill. There were no incentives for new nuclear plants, no risk insurance, no tax credits, no loan guarantees. A year ago, there were no real plans for any new nuclear plants to be built in the United States. A lot of need, a lot of concern. The utility industry was looking, in the out years, to baseload, wanting to do nu-

clear. But today we believe there are 19 new reactors on the drawing boards of America's industries.

So, it is a phenomenal transition, Mr. Chairman, from where we were to where we are. And how we keep that going is going to be awfully important, not only for the future of our country, but literally for the future of the world. The President, with his India nuclear deal of 14 reactors, just in the last 24 hours, is a big deal. It's an important deal as it relates to proliferation and our ability to get our collective, and the world's collective, arms around spent fuels and all of that type of thing. And I applaud you, Clay, for the work you've done on GNEP, or the Global Nuclear Energy Partnership. It is a very important component in where we head as a world into resolving the waste stream issue and a concern that may exist still by some, as there is legitimacy to it, of proliferation.

As you know, I and others have worked awfully close on—and with you—on a new-generation concept beyond GNEP. And we actually legislated it into the policy. And these are policies that fit well together, and should be looked at in that context, I would hope. And I say that, because clearly the technology is there, not only for nuclear, but the President's initiative. His bold step, very early on in the administration, to link hydrogen to the ability of the nuclear industry, led me, this past week, to go downtown to NEI R&D summit and challenge them, and say, "Why don't you get outside this big new box you're in. It's an exciting box, building new reactors, building new baseload, bringing in the efficiencies of clean, non-emitting energy. At the same time, you're still thinking of it in the context of nuclear generation alone. Maybe we ought to think beyond that, to not only nuclear generation, but hydrogen production, not unlike what the folks in the coal industry are doing with Future Gen." And so, it's not that I coin a phrase, but I said, "Why don't we talk about Freedom Gen? Why don't we get this country up off its knees and start running?" You know, I was one of those—and Pete and I—the problem we've got in this committee is that we think we know so much about energy—and we, collectively, do, thanks to people like you, who used to be with us, and other great staff people—and when somebody says, "You know, this Nation could be energy independent," we all step back and say, "Whoa, whoa, whoa. I don't think we could ever get there."

I think how exciting it is for this President—and we almost got him there in the State of the Union—to challenge this country to get well beyond where it ever thought it could go. It's those kinds of challenges that really have made this country great. It is not impossible, from an electric standpoint, with coal new technology, nuclear new technology, to be independent there, that's for sure, and then to start adding other components to it. The Energy bill that we passed in July, that was signed in August, does just that. And because many of us were concerned about where we went with other world initiatives out there that related to climate change, we challenged this President. You all met the challenge. He went out and started talking about an Asia-Pacific initiative that makes an awful lot of sense and fits into the GNEP concept beautifully well.

So, there are an awful lot of exciting things happening out there. And I think this committee is—has done what oftentimes in Congress we really don't get done, we've actually created, thanks to

your leadership, Mr. Chairman, a significant and powerful new national policy that is now moving and driving. And we need to strengthen it where we can. We need to add new to it where we will. Your leadership at the Department of Energy with this Secretary will help us a great deal.

So, I'm anxious to hear your presentation as it relates to the Global Nuclear Energy Partnership. And then let's see how we can blend it with other initiatives underway to see if there is an economy of scale and a value that can be created by all of these things converging together into our budgets and into the technology and capability of America's mindset.

Thank you, Mr. Chairman.

Senator DOMENICI. Thank you, Senator.

Senator Allard, first of all, let me say I'm very pleased that you're with us. You're not brand new; I didn't mean that. But, you know, we haven't had you around very long. And you're going to find this is a very fun subcommittee with lots of work to do. And some of the things that you've been working on are here, and you'll have a lot more opportunity to work on them, because you'll fund them here. So, if you'd like to make a few opening remarks, we'll let you——

Senator ALLARD. Well, I'd love to, Mr. Chairman.

Senator DOMENICI. If you'll make them as brief as you can, because of the 3 o'clock vote?

Senator ALLARD. Oh, I'll do that, Mr. Chairman.

STATEMENT OF SENATOR WAYNE ALLARD

Senator ALLARD. First of all, I'm absolutely thrilled to be a part of this committee, and was glad I had the opportunity to serve on it, because you've been such a leader on meeting our energy needs in this country, and I want to join you in that effort.

You know, there's no doubt in my mind that we need to have an ample source of energy—to meet the security needs of this country, primarily, but also just to meet consumer needs, and for us to be competitive throughout the world.

PREPARED STATEMENT

I have a couple of pages here of comments. I'm just going to ask that they be inserted into the record, in addition to what I've just stated.

And I look forward to working with you, Secretary Sell, because I do want to give my colleagues an opportunity to say a few remarks, also.

Thank you, Mr. Chairman.

[The statement follows:]

PREPARED STATEMENT OF SENATOR WAYNE ALLARD

Mr. Chairman, I am very pleased to be a member of this committee, and I thank you for holding this very important hearing today. I think that nuclear energy is one of the most promising energy sources before us. It promises large supplies of clean energy. I have long said that America must diversify its energy sources, and the option of using nuclear simply must be on the table.

Many people have been critical of the United States for not signing on to the Kyoto Protocol. Now, several years later when those countries that did join are being required to meet their first targets, many are not able to do so. France is one

of the few countries meeting its target, and they are doing so largely because they are heavily reliant on nuclear energy.

When we stopped reprocessing in the 1970's, England, France and Japan kept moving forward. They are now operating successful reprocessing facilities. Several years ago I visited sites in France and England where they are currently reprocessing spent nuclear fuel. The process is safe and efficient, and something that we should have been doing in this country years ago.

There is a large up-front investment that has to be made in order to reprocess spent fuel. But I would like to use an analogy that some people may find easier to understand. To build a house in an energy efficient manner is more expensive to build one to regular standards. You have to spend more on higher quality insulation, solar panels cost money, more efficient appliances cost a little more. But you save a lot of money down the road when you pay less in utility charges. Similarly, while the investment for a reprocessing facility is high, because 96 percent of the fuel can be reused, much less must be expended on storage down the road, and much less "new" fuel must be acquired.

I look forward to working with my colleagues and the administration on this very important issue.

Senator DOMENICI. Before I call on Senator Murray, let me say to the Senators that are here, I understand we have two votes at 3 o'clock. And the Energy Committee, which is the two of us, we have a 3:30 meeting.

Senator Allard, is there any—by any chance, could you use part of your afternoon to wrap up these hearings, if we have to?

Senator ALLARD. I believe I can, but let me check my schedule, please, and I'll get back to you in just a minute.

Senator DOMENICI. Senator Murray, would you like to make a few opening remarks?

STATEMENT OF SENATOR PATTY MURRAY

Senator MURRAY. I would, Mr. Chairman, thank you.

And I understand the time limitations, but I did want to say, Secretary Sell, first, thank you, and good afternoon. It's good to see you back on the Hill.

I do have significant reservations, I have to say, about the Department's GNEP proposal. Energy security in our Nation is a top priority for me, like everyone, and we have to do more to wean ourselves off foreign imports of energy sources and replace them with some secure domestic sources. But I strongly question whether GNEP is the answer. I'm not opposed to nuclear energy. All sources of energy have to be explored and utilized if we're to find the best mix for the United States to achieve energy independence. But that requires taking a very hard look at possible sources, and considering several factors, including availability, technical feasibility, environmental impact, and the economics of developing that new resource. And we also have to look for solutions to our energy problems now in using those criteria. That's why I think this proposal falls short.

From what I can tell, it has not gone through the necessary peer review, it's without strong economic cost analysis, and it does nothing to address our energy needs in the near-or mid-term.

But before we go further, I have to point out that this proposal seems to gloss over the difficulty this country has in managing our nuclear waste. And I want to revisit quickly another proposal on cleanup offered by DOE. Accelerated cleanup was sold as a plan to focus on one contaminated site, and once that site was cleaned up and closed, the funds would then be redirected to other sites to ac-

celerate cleanup. The good news, of course, is Rocky Flats was closed this year. But the bad news is, is the EM budget request is cut by $762 million in 2007. DOE broke that deal with the sites, the States, and the Congress. And rather than addressing the nuclear waste legacy, DOE has shifted focus to other areas and left our communities holding the bag.

I'm particularly disturbed by comments made by Under Secretary Garman, when he spoke to the Energy Facility Contractors Group last month. He called for us to get honest about the cleanup projects left around the country. The context of those comments is, the cleanup agreements between the Government and the States. The Government is failing to meet milestones. Funding is being cut back. And DOE officials are telling our States to get honest. DOE signed these agreements and should not be looking to break them.

It's another example of the mixed messages that DOE sends on its cleanup responsibilities. Last year, I had to fight very hard for funding for the vit plant on the Hanford site. I was told by Secretary Bodman, and by you, that DOE stood behind the project. I found that hard to believe, when the only DOE funds offered up for rescission was the $100 million from the vit plant.

In the President's 2007 budget proposal, there is $690 million for the vit plant, and I'm relieved. The budget request is finally where it should be. But the funds for the tank farm activities are down by $52 million, which includes a zeroing out of bulk vit plant. That was proposed by the administration as a way to get the tank waste treated faster, and now the request is zero.

So, let's get honest. DOE has a poor record when it comes to managing nuclear waste. GNEP will add the waste inventory, while doing nothing in the near term to help achieve energy independence. Today there is no place to permanently store spent nuclear fuel. The request for GNEP is $250 million, while the request for EM funds is down. It's striking to me that DOE has proposed a project that would create the same kind of waste that we are struggling to retrieve and treat at the Hanford Tank Farm. I have many concerns, and I'm eager to hear your presentation and to address them during the appropriations cycle.

Thank you, Mr. Chairman.

PREPARED STATEMENT OF SENATOR THAD COCHRAN

Senator DOMENICI. Thank you very much. Senator Cochran has submitted a statement which we will also include for the record.

[The statement follows:]

PREPARED STATEMENT OF SENATOR THAD COCHRAN

Mr. Chairman, I am pleased to join you in welcoming Deputy Secretary Sell to the subcommittee, and I look forward to his testimony about the fiscal year 2007 Budget Proposal for the Global Nuclear Energy Partnership.

Secretary Sell, welcome back to the subcommittee where you worked as clerk for 4 years. Your service on this important subcommittee gives you a solid background to execute our national global nuclear strategy. I am pleased that the Department of Energy is working on a long term strategy to address the nuclear needs of our Nation, from the execution of our nuclear security to the deployment of new nuclear power plants. There is a great need for nuclear power in this country, and as we look to the future, there is going to be an increased need for energy production. Nuclear must be a significant part of that production.

My State is home to the Grand Gulf nuclear power facility in Port Gibson, Mississippi. In addition, we are a leading site to host a new commercial nuclear power plant, which will not only provide jobs and stimulate economic development, but could also provide future rate relief to my State's electricity customers. The support of this new facility would relieve the burden of high cost natural gas currently used to generate electricity.

Lastly, in order to support the exiting fleet of nuclear power plants, as well as support the building of new nuclear facilities, we must recognize the nuclear spent fuel situation. Customers have been contributing to the nuclear waste fund for many years and have seen little benefit from their investment. Utilities have been in litigation with the government spending millions of dollars in legal fees over the issues surrounding spent fuel. I hope that we will work to address these problems so that this country can build a clean and reliable fleet of new nuclear plants.

We will continue to discuss the details of this program over the next few months. I look forward to working with you and my colleagues on the Appropriations Committee to analyze this new initiative and make the best decisions for fiscal year 2007. Thank you for your good assistance in our efforts to make wise decisions.

Senator DOMENICI. Mr. Secretary, please proceed.

Mr. SELL. Thank you very much, Mr.—

Senator DOMENICI. Don't worry about that.

STATEMENT OF HON. CLAY SELL

Mr. SELL. Well, I don't want to lose my audience too quickly.

Mr. Chairman, Ranking Member Reid, Senator Craig, Senator Allard, Senator Murray, it is truly an honor and a great pleasure for me to have this opportunity to come back before this subcommittee to discuss the administration's proposed Global Nuclear Energy Partnership, or what we call GNEP.

Thank you for allowing my written statement to go into the record, and I would like to make some summary comments. And I will try to do that in 5 or 7 minutes.

In many respects, I believe it is appropriate that the first public hearing on GNEP occur here before this subcommittee. From Chairman Domenici's 1997 Harvard speech calling for a broad reconsideration of nuclear policy and reprocessing, to this committee's role in funding plutonium disposition, to this committee's role in funding a great breadth of nonproliferation initiatives, to the creation of the Advanced Fuel Cycle Initiative under the chairmanship of then-Chairman Reid in 2002, this committee, along with your counterparts in the House, has always provided great bipartisan leadership on nuclear matters within our government. So, it is a pleasure to be here today to discuss GNEP.

I would like to tell you today why we are proposing GNEP. I'd like to elaborate on what it exactly is and how we propose, with the support of this subcommittee, to get started.

The President has stated a policy goal of promoting a great expansion of nuclear power here in the United States and around the world. The reasons for this are obvious. As the chairman said, the Department of Energy projects that total world energy demand will increase—will double by 2050. And looking only at electricity, projections indicate an increase of over 75 percent in the next 20 years—75 percent increase in electricity demand over the next 20 years.

Nuclear power——

Senator DOMENICI. Now, that's worldwide.

Mr. SELL. That's worldwide.

Senator DOMENICI. Worldwide.

Mr. SELL. Nuclear power is the only mature technology of significant potential to provide large amounts of completely emissions-free baseload power to meet this need. It will result in significant benefits for clean development around the globe, reduced world greenhouse gas intensities, pollution abatement, and the security that comes from greater energy diversity.

But nuclear power, with all of its potential for mankind, carries with it two significant challenges. The first: What do we do with the nuclear waste? And the second one: How can we prevent the proliferation of fuel-cycle technologies that lead to weaponization?

GNEP seeks to address and minimize these two challenges by developing technologies to recycle the spent fuel in a proliferation-resistant manner and support a reordering of the global nuclear enterprise to encourage the leasing of fuel from what we'll call "fuel-cycle states" in a way that presents strong commercial incentives against new states building their own enrichment and reprocessing capabilities.

Regarding our own policy on spent nuclear fuel, the United States stopped the old form of reprocessing in the 1970's, principally because it could be used to produce plutonium. But the rest of the major nuclear economies, in France, in Great Britain, in Russia, in Japan, and in others, continued on without us. The world today has a buildup of nearly 250 metric tons of separated civilian plutonium. It has vast amounts of spent fuel. And we risk the continued spread of fuel-cycle technologies.

If we look only for a moment at the United States, we are on the verge of a U.S. nuclear renaissance. In many respects, due to the provisions enacted in the Energy Policy Act of 2005, new plants will be built. But if we want many more built—and we need them—I believe the United States must rethink the wisdom of our once-through spent-fuel policy. We must move to recycling.

This administration remains confident that Yucca Mountain is the best location for the United States—for a permanent geologic repository. And getting that facility licensed and opened remains a top priority. Whether we recycle or not, we must have Yucca Mountain. But the capacity of Yucca Mountain, as currently configured, will be oversubscribed by 2010. If nuclear power remains only at 20 percent for the balance of this century, we will have to build the equivalent of nine Yucca Mountains to contain once-through spent fuel.

The administration believes——

Senator DOMENICI. Would you make that statement again?

Mr. SELL. If we continue to have nuclear generation at 20 percent for the balance of this century, because of our once-through spent-fuel policy, we will have to build the equivalent of nine Yucca Mountains.

The administration believes that the wiser course is to recycle the used fuel coming out of the reactors, reducing its quantity and its radiotoxicity so that only one Yucca Mountain will be required for the balance of this century.

So, what exactly is, then, GNEP? GNEP really is——

Senator DOMENICI. Can I interrupt you?

Mr. SELL. Yes, sir.

Senator DOMENICI. And that one Yucca Mountain, under that scenario, would not be filled with the kind of waste we plan on putting in it now, right?

Mr. SELL. It would be filled—we still have a significant amount of Defense waste, in Senator Murray's home State, in Senator Craig's home State, that will go to Yucca Mountain. And there——

Senator DOMENICI. I'm speaking of the domestic side.

Mr. SELL. And on the commercial spent fuel, we believe that up to 90 percent of commercial spent fuel could be recycled before going to Yucca Mountain.

Senator DOMENICI. Which means it would be a different spent fuel.

Mr. SELL. It would be—it would be in a condition with a very low—with a peak dose occurring in year one thousand versus year one million. It would be in a more stable glass form. And it's the radiotoxicity of the waste which really drives capacity size. And by reducing the radiotoxicity, you could fill Yucca Mountain with this glacious stable waste. And that would—we think, would be enough for this century.

Senator DOMENICI. Excuse me for interrupting. Thank you.

Mr. SELL. GNEP is really about identifying the policies, developing the technologies, and building the international regimes that would manage and promote such a growth in nuclear generation in a way that enhances our waste management and nonproliferation objectives.

The program and its full detail is laid out in my prepared statement. But I would like to focus on a few of the key engineering and development efforts that are key to GNEP's success.

First, the Department of Energy seeks to greatly accelerate its work in the demonstration of advanced recycling. This effort builds on the Advanced Fuel Cycle Initiative initiated by this—or by Congress, and specifically this committee, several years ago. We have developed, in the laboratory, recycling technology that does not separate plutonium like the current reprocessing technologies that are used around the globe. Rather, it keeps the actinides together, including plutonium, so that they can be made into fuel to be consumed in fast reactors that will also produce electricity. By not separating plutonium and building in the most advanced safeguard technologies, recycling can be done in a way that greatly reduces proliferation concerns.

Another key objective of GNEP would be to demonstrate, at engineering scale, an advanced burner reactor that can be used to consume plutonium and other actinides, extract the energy potential out of recycled fuel, reducing the radiotoxicity of the waste in repeating cycles so that the waste that comes out of the reactor requires dramatically less geologic repository space.

These technologies come together in the reliable fuel services framework. GNEP will build and strengthen a reliable international fuel services consortium under which fuel supplier nations would choose to operate both nuclear power plants and fuel production and handling facilities while providing reliable fuel services to user nations that choose to only operate nuclear power plants. This international consortium is a critical component of the nonproliferation benefits of the GNEP initiative.

The notion is as indicated on the first chart over here—in exchange for assured fuel supply, on attractive commercial terms, user nations that are interested in bringing the benefits of nuclear power to their economies would suspend any investments in enrichment and recycling. Under the Non-Proliferation Treaty, they have a right to do that. They have a sovereign right. And what we are trying to provide is attractive commercial incentives that would discourage them from acting on those rights.

There are two other key elements of GNEP, from a technology development standpoint. We would hope to work in partnership with other nations to develop small proliferation-resistant, perhaps modular or factory-built reactors that are appropriate for the grids of the developing world. And, in fact, many of the technologies, Senator Craig, being developed as part of the next-generation nuclear plant are appropriate—particularly the gas reactor technology—are appropriate candidates for these types of small-scale reactors.

And, in all cases, we will work to develop and incorporate in the most advanced safeguards technologies and ensure and emphasize best practices for handling of nuclear materials worldwide.

So, how do we hope to begin? In fiscal year 2006 and 2007, the Department proposes to concentrate its efforts on technology development to support a 2008 decision on whether to proceed with these demonstrations. In general terms, our $250 million request for 2007 funding is to initiate work on separations and advanced fuels technology development, transmutation engineering, systems analyses, and planning functions to support the demonstration of a UREX+ recycling plant and to support, over a 10-year period, the demonstration of an advanced burner reactor.

In conclusion, we need to pursue all energy technologies to address the anticipated growth in demand for energy. But, clearly, the growth of nuclear energy is vitally important for the United States and for the world.

Our country can choose to continue down the current path, or we can lead the transformation to a new, safer, and more secure approach to nuclear energy, an approach that brings the benefits of nuclear energy to the world while reducing vulnerabilities from proliferation and from nuclear waste. We believe that we are in a stronger position to shape the future if we are part of it and if we are leading it. And, in many respects as it relates to the fuel cycle, the United States has yielded our leadership position over the last 30 years. We think we need to reclaim it.

Challenges remain in demonstrating the GNEP technologies. But without GNEP, there will be more plutonium throughout the world for generations to come. There will be more spent fuel. There will be greater proliferation risk. There will be more greenhouse gases emitted into the environment, and less energy here at home and abroad. The Global Nuclear Energy Partnership is not a silver bullet, but it is part of a broad strategy, that, when combined with advancements in renewables, clean coal, and other technology developments, can, and will, make a difference in the security, environmental, and energy challenges that we face.

PREPARED STATEMENT

I ask, and I seek, the committee's support of this initiative. I look forward to your questions. And I look forward to working with you as the year progresses.

I'm pleased to take any questions you have.

[The statement follows:]

PREPARED STATEMENT OF HON. CLAY SELL

Mr. Chairman, Senator Reid, and members of the subcommittee, it is a pleasure to be here today to discuss the Department of Energy's fiscal year 2007 budget request of $250 million, to begin investments in the Global Nuclear Energy Partnership (GNEP). This new initiative, which is part of President Bush's Advanced Energy Initiative, is based on a simple principle: that energy and security can go hand in hand.

It is a comprehensive strategy that would 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 address proliferation concerns. GNEP seeks to encourage the future leasing of fuel from fuel cycle states in a way that allows new states 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 alleviate proliferation concerns.

The Department of Energy recently estimated that the global demand for energy may increase as much as 50 percent by 2025, with more than half of that growth coming from the world's emerging economies. Specifically, regarding electricity, the growth is projected to be particularly steep, increasing over 75 percent over the next two decades. To begin addressing that challenge today, the President has stated a policy goal that includes world-wide expansion of nuclear power.

The reasons for this are clear. Nuclear power is a mature technology of significant potential to provide large amounts of emissions free base load power. Benefits from nuclear power include the abatement of greenhouse gas emissions, air pollution, and energy diversity. Other nations have reached a similar conclusion. With 24 new nuclear plants under construction world wide and additional plants planned or under consideration, it is important that nuclear energy expand in a way that supports safety, security, and the environment.

All of these factors point to the need for a widespread expansion in the use of nuclear energy. To encourage and support such an expansion, the Department is advocating a new approach to the fuel cycle which we believe will significantly enhance our management of used nuclear fuel. This approach should allow us to make more efficient use of our uranium resources. Based on technological advancements that would be made through GNEP, the volume and radiotoxicity of waste requiring permanent disposal will be greatly reduced, delaying the need for an additional repository through the end of the century.

To meet the goals of GNEP, the Department has developed a broad implementation strategy comprised of seven elements.

First, we must sustain and expand the use of nuclear power in the United States. Action is needed to ensure that there are successor plants to those that supply nearly 20 percent of our electricity. Efficiency gains to existing reactors over the past decade have added the equivalent of 25 additional reactors to the grid, but such gains are approaching a limit. We must build on advances made by the President and Congress to stimulate new nuclear plant construction.

In 2002, the administration announced the Nuclear Power 2010 program, a cost-shared initiative with industry aimed at demonstrating the streamlined regulations for siting and constructing new nuclear plants. Much progress has been made since this program was first announced and today the Department is sponsoring two demonstrations aimed at submitting and obtaining approval of the first combined Construction and Operating License (COL) applications.

DOE is currently working with two consortia of nuclear generating companies and vendors to prepare and submit these COL applications to the NRC by 2007 and 2008, respectively. This, together with the incentives enacted through the Energy Policy Act of 2005 (EPACT 2005) will enable generating companies to proceed with new nuclear plant projects.

The Department is responsible for implementing the Standby Support for Certain Nuclear Plant Delays provisions of EPACT, which is a form of Federal risk insurance to encourage investment in advanced nuclear power facilities by providing coverage for certain costs resulting from certain regulatory or litigation delays. Addi-

tionally, EPACT 2005 contains provisions for production tax credits for advanced nuclear facilities, and a loan guarantee program for low-emission energy production technologies, such as nuclear power plants. We are confident we will see new plants under construction within the next 10 years.

Second, we must address the issue of nuclear waste. A geologic repository is a necessity under all fuel management scenarios, and the 2007 budget request provides $544.5 million to maintain steady progress toward opening the Yucca Mountain repository.

Under GNEP, commercial spent nuclear fuel would be recycled so that transuranic elements would be consumed, not disposed of as waste. Residual waste fission products would be reconfigured for disposal at a geologic repository. In addition, direct disposal will be the only option for a small portion of older commercial spent fuel and certain specialized fuels for which separations processes have not been developed.

GNEP would provide three improvements to spent fuel disposal at a repository by significantly reducing the volume of nuclear waste, enhancing thermal management by reducing the waste form heat load, and reducing the amount of long-lived radionuclides requiring disposal eliminating the need for an additional repository through the end of the century.

Third, we propose to demonstrate recycling technology that would enhance the proliferation-resistance of the fuel cycle compared to existing reprocessing technologies called Plutonium-Uranium Extraction or PUREX. To accomplish this, the Department would accelerate through the Office of Nuclear Energy, Science and Technology's Advanced Fuel Cycle Initiative (AFCI), the development, demonstration, and deployment of new technologies to recycle spent fuel—these are technologies that would not result in separated plutonium—a key proliferation concern presented by current generation reprocessing technologies. Moreover, this technology would only be deployed in partnership with other fuel supplier nations.

The AFCI program legislated by the Congress has over the years identified promising advanced nuclear technology options that are sufficiently developed to allow for a demonstration program to proceed. Acting now will enable us to help shape the global fuel cycle and prepare to accommodate growth in emission-free nuclear power.

In support of this effort, the United States would propose to work with international partners to conduct an engineering-scale demonstration of advanced recycling technologies (e.g., a process called Uranium Extraction Plus or UREX+), that would separate the usable components in used commercial fuel from its waste components, without separating pure plutonium.

Fourth, the United States would develop and demonstrate Advanced Burner Reactors (or ABRs). These "fast neutron" reactors would be designed to consume transuranic elements in used fuel from nuclear power plants, avoiding the need to accommodate this radioactive, radiotoxic, and heat-producing material in a geologic repository for hundreds of thousands of years while it decays. The Department would also propose a new facility that could potentially serve the fuel testing needs of the Nation for the next 50 years, and be used to develop and test the fuels for the advanced burner reactor made from the transuranic product from the UREX+ process.

Fifth, GNEP would build and strengthen a reliable international fuel services consortium of nations with advanced nuclear technologies to enable developing nations to acquire nuclear energy while minimizing nuclear risk. Under a cradle-to-grave fuel leasing approach, fuel supplier nations would provide fresh fuel to conventional nuclear power plants, including small scale reactors, located in user nations that agree to refrain from enrichment and reprocessing.

Used fuel would then be returned to the fuel supplier nations and recycled using a process that does not result in separated plutonium. The recycled fuel would then be used in an ABR in fuel supplier nations. Arrangements would be available to assure secure supply to user nations. Such an approach would allow user nations to receive the benefit of having a reliable supply of reactor fuel without having to make the significant infrastructure investments required for enriching, recycling and disposal facilities.

This approach builds on and goes beyond current International Atomic Energy Agency (IAEA) obligations—user nations would consent to refrain from enrichment and reprocessing for an agreed period, based on economic interest. States choosing to stay outside the GNEP framework and develop their own fuel cycle facilities would receive increased scrutiny. We recognize that there are responsible states that have partial fuel cycles, that do not fit the basic conceptual model, but whose interests can be accommodated in the GNEP framework.

Sixth, the United States would work with the international community to pursue development and deployment of small-scale reactors designed to be cost-effective, in-

herently secure and well-suited to conditions in developing nations. The United States would also encourage developing and deploying a small scale reactor that utilizes the same nuclear fuel for the lifetime of the reactor, eliminating the need for fuel replacement. As world population increases by 3 billion people by 2050, energy demands and world cities will expand, making it all the more important to provide the option of meeting some of that increased energy demand without increased greenhouse gas emissions or pollution.

Finally, under GNEP, an international safeguards program is an integral part of the global expansion of nuclear energy and the development of future fuel cycle technologies with enhanced proliferation-resistance. In order for the IAEA to effectively and efficiently monitor and verify nuclear materials, the United States would propose to design advanced safeguards approaches directly into the planning and building of new, advanced nuclear facilities and small-scale reactors. Over the next year, we will work with other elements of the Department to establish GNEP, paying special attention to developing advanced safeguards and developing the parameters for international cooperation. We will also continue to work closely with IAEA and our international partners to ensure that civilian nuclear facilities are used only for peaceful purposes.

The Department has proposed $250 million in the fiscal year 2007 budget as an initial step of a plan to accelerate the development of technology as part of GNEP. With these funds, the Department would focus its AFCI research and development on preparing for an engineering-scale demonstration of the most promising recycling technologies, such as the UREX+ separations technology, advanced burner reactors and an advanced fuel cycle facility, used to fabricate and test the fuels for advanced burner reactors.

This request represents the Department's best assessment of the GNEP program technical development priorities and sequencing toward demonstration facilities. The fiscal year 2007 request shows that significant growth in funding over the fiscal year 2007 request is necessary for the planning of the three integrated demonstration facilities.

In fiscal year 2006, mission need would be established for these facilities and the Department would begin work on an Environmental Impact Statement for the three facilities, which would continue through fiscal year 2007. In parallel with this, in both fiscal year 2006 and fiscal year 2007, the Department would continue research and development to refine the UREX+ technology, begin work on a conceptual design report, acquisition strategy, functions and operating requirements and other analyses leading to the development of baseline costs and schedules for the UREX+ demonstration, the advanced burner reactor, and the advanced fuel cycle facility by the end of 2007.

The Department would propose to invest $25 million on the advanced burner reactor technology in fiscal year 2007, to complete pre-conceptual design and complete a series of extensive studies to establish cost and schedule baselines and determine the scope, safety, and health risks associated with fuel design, siting and acquisition options. Last month, the United States signed a systems arrangement agreement with France's atomic energy commission and the Japan Atomic Energy Agency to cooperate on the development of sodium fast reactors. It is anticipated that this agreement will establish the foundation for further collaborations on fast reactors with these countries, and others that are expected to join the agreement in the future, in support of GNEP.

The Department's goal is to continue research, development and experiments on the key technologies, complete technical and economic feasibility studies and develop a more detailed costs and schedules for these demonstration facilities to inform decisions by early 2008 on whether to proceed to the next phase, building these demonstration facilities. Appropriate pilot scale research and development for the demonstration projects would proceed to develop an improved planning basis for these facilities.

More accurate estimates of the demonstration phase will be available as the conceptual design phase is completed. As noted earlier, the Department has already started to engage other countries and we will be looking for a sizeable portion of GNEP costs to be shared by our partners and industry starting in fiscal year 2008.

In summary, nuclear energy by itself is not a silver bullet for energy supply, in the world or for the United States and we need all technologies to address the anticipated growth in demand for energy. Regardless of the steps the United States takes, nuclear energy is expected to continue to expand around the globe.

We can continue down the same path that we have been on for the last 30 years or we can lead a transformation to a new, safer, and more secure approach to nuclear energy, an approach that brings the benefits of nuclear energy to the world while reducing vulnerabilities from proliferation and nuclear waste. We are in a

much stronger position to shape the nuclear future if we are part of it and hence, GNEP. GNEP is a program that that looks at the energy challenges of today and tomorrow and envisions a safer and more secure future, encouraging cooperation between nations to permit peaceful expansion of nuclear technology while helping to address the challenges of energy supply, proliferation, and global climate change.

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

RECYCLING SPENT FUEL TECHNOLOGY

Senator DOMENICI. Thank you very much, Mr. Secretary. That's a very succinct and understandable presentation.

We're going to have to learn to use some words that I'm going to start with today and see if I can get them fixed in my own mind.

Europe recycles or reprocesses now, do they not?

Mr. SELL. That's correct.

Senator DOMENICI. And they use a rather well known process called PUREX?

Mr. SELL. They do.

Senator DOMENICI. Tell me—or let me ask. That process—we're going to go one step further, or one step better—if this program is adopted and carried out, because the PUREX process does not—separates out plutonium in a liquid form as it proceeds through its process. Is that correct?

Mr. SELL. Yes, that is correct.

Senator DOMENICI. Therefore, it is—go ahead and get some water—therefore, it has some proliferation problems that are pretty obvious, is that not correct?

Mr. SELL. That's correct.

Senator DOMENICI. Now, the President, in his proposal, has chosen to go to a next-technology, which is UREX+. And I think you've stated to us the difference, but let me just put it in the context of the difference between what's going in the world now and what we would be doing. In our process, as the—as it proceeded, what would come out when you run the spent fuel through would not be pure plutonium, it would never separate out. It would come out in a compound attached, and never be liquid and never be separate. Is that correct?

Mr. SELL. That's correct.

Senator DOMENICI. And then, that—what you get as a result of that is reused—is that correct?—and reburned, so that you make more energy and use up the energy that we were going to throw away when we were going to lock it up in Yucca Mountain?

Mr. SELL. The product streams out of the UREX+ process produce uranium, they produce an actinide stream, which is plutonium bound with the other actinides, and then a fission product stream. The fission product stream would be disposed of. The actinides would be made into fuel that would be burned in the advanced burner reactor. And the uranium could be either re-enriched for use in a lightwater reactor, or it could be disposed of as low-level waste.

Senator DOMENICI. Now, where are these processes, at this point? And what will the $250-plus-million that you're asking for from this committee be used for?

Mr. SELL. The UREX+ technology has been demonstrated at a laboratory scale.

Senator DOMENICI. Where?

Mr. SELL. At Argonne National Lab.

Senator DOMENICI. Right.

Mr. SELL. And it is our intent—and we think it is important—to move to demonstrate that technology on an engineering scale. It is our hope, and it is our expectation, that—in order for an approach like GNEP to work, that these technologies need to be commercialized. But there is significant engineering and development work that needs to be done. And so, a great majority of the amount of money that we are requesting for fiscal year 2007 would be used to support the design work, the environmental work, and other development work that needs to be done to support a decision to construct a demonstration facility in 2008.

And if I can go back, you mentioned PUREX. You know, PUREX was actually developed here in the United States——

Senator DOMENICI. Correct.

Mr. SELL [continuing]. As part of our weapons program, so that we could produce plutonium for use in nuclear weapons. And it was—we used it here in the United States on the commercial side, and it was in the mid-1970's that we decided, for proliferation reasons—and I think perhaps correctly, we decided that we should stop doing that. And we hoped, when we made that decision—when President Carter made that decision in 1977, that the rest of the world would follow. But they did not. And the rest of the world has deployed PUREX on a commercial scale, resulting in 250 metric tons of plutonium that is now in commerce around the world today. And that presents, in our judgment, a significant generational proliferation concern. And we want to develop technologies that will stop the production of plutonium, and also technologies that can be used to burn down plutonium stockpiles, plutonium inventories, over the coming decades.

Senator DOMENICI. Thank you for that explanation. That—I failed to mention, that is our technology. We did do it. We did use it. I mean, it was commercialized.

I'm going to yield now to Senator Craig. And the vote's not yet up, incidentally.

Senator CRAIG. Mr. Chairman, let me go for a few moments. But my guess is that we probably ought to get out of here in 5, hadn't we, if we're going to——

Senator DOMENICI. Go to our meeting?

Senator CRAIG [continuing]. Catch that vote?

Senator DOMENICI. Yes. Is it up now, the vote?

Senator CRAIG. The vote is on now.

Senator DOMENICI. I'm very sorry. I didn't see it.

Senator CRAIG. Yeah, the vote is——

Senator DOMENICI. I guess we should.

Senator CRAIG [continuing]. The vote is on now.

Senator DOMENICI. Senator, why don't you proceed, and then—Senator Allard, do you want to go vote and come back?

Senator ALLARD. Yeah, that's what my plan would be.

Senator DOMENICI. Please do that.

Senator ALLARD. We have two votes on, Mr. Chairman.

Senator DOMENICI. All right. We'll just remind the Secretary to wait just a while, while we have two votes. He's going to come back

and complete the meeting. I'm going to wait until the last minute here.

DEPARTMENT'S GNEP TECHNOLOGY OBJECTIVES

Senator CRAIG. Okay.

Mr. Secretary, in GNEP, the initial phase that you're talking about, the engineering scale demonstration phase, proliferation-resistant spent-fuel processing, how long—you said construction by 2008. When do you think that plays out? And we're looking at a price tag for totality of that of upwards of——

Mr. SELL. The—just for the UREX+ demonstration facility, we would anticipate—even though it would be sized somewhere probably in the 10 to 25 metric-ton-per-year size, so relatively small—but, on order, we would expect that facility—our best estimates on the costs would be between $700 million and $1.5 billion. And we would hope to begin construction in 2008, and have construction complete 3 to 4 years thereafter, to go into operations.

Senator CRAIG. And then the next phase is what, the advanced fuel cycle?

Mr. SELL. The next phase would be the—within 10 years, we would like to build a demonstration advanced burner reactor.

Senator CRAIG. Burner reactor.

Mr. SELL. There are a number of potential technologies that could be used for that. And we want to do a substantial amount of work in conjunction with our international partners, in determining the appropriate technology. But we would hope to build and—to construct and operate that within 10 years.

The key R&D challenge—the biggest R&D challenge—we've done UREX+ in the lab. We've built, certainly, fast reactors that can be modified for a burner role. The biggest challenge is in developing and qualifying an actinide-based fuel. And so, that will require significant laboratory work to develop that fuel.

As you know, today we are doing small-scale actinide fuel tests, in partnership with France, in their fast reactor, as well as in partnership with Japan. But that's going to require a significant amount of development work over the next 5 to 10 years.

Senator CRAIG. Then in this whole concept, the exportable modular reactor is the last phase—is that where the effort to contain—to offer up, but contain——

Mr. SELL. Under Secretary Bob Joseph and I, we went to a number of capitals in the United Kingdom, France—we saw Dr. El Baradei in Vienna—Moscow, Beijing, and Tokyo, to talk about this idea. And the ideas were well received, and the objectives of GNEP were well received. But there was a tremendous amount of interest in not just those countries, but other counties—South Korea and others, Canada perhaps—joining together with us in developing advanced reactors for deployment in the developing world.

And so, that is something that we would seek to move, in parallel with these other technology development efforts. And it is something that we would hope to have significant international participation in, as well.

Senator CRAIG. Okay. I suspect, Mr. Chairman, that we ought to——

Senator DOMENICI. Could I just follow up on your very last one, and you wait on it?

Senator CRAIG. Yes.

Senator DOMENICI. The one thing that I keep hearing—and I want to stress it a little bit, in context of Larry's last question—we talk about the internationalization of this issue and the partnership. And I hope that as you talk about the costs for these various demonstrations and moving from a small one to the next level, that you are talking about the possibility, or even the probability, that we can get our partnership countries to come into that ball game, too, of helping develop those kinds of experimental projects. Because they will be costly. I'm not sitting up here saying I'm against things of this type because they're costly. I'm excited that America might be a considering a major new program of this type. This is what we used to be about; but we've gotten so fearful, we won't do anything like this. So, I'm on board. But it seems to me the benefits are not going to be just to us, right?

Mr. SELL. That's correct. There is—when we think about it in the international context, I mean, on the first order, as I said earlier, we've—in some ways, we have yielded our leadership role in the fuel cycle. The French, the British, the Japanese, and the Russians have gone on without us for 30 years. And they have significant capabilities—in some cases, that are better than ours.

Senator DOMENICI. Right.

Mr. SELL. And so, we are seeking to work in partnership with them to accelerate, to take advantage of the advances we have each made to accelerate the development, the demonstration, and the deployment of these technologies as quickly as possible. So, they bring talent and expertise to the table.

But one of the other things that has been quite encouraging is that they also seek full partnership, which means in-kind contributions, and, we would expect, significant financial contributions. That is—we really seek to pursue these technologies in partnership. And that is, in addition to the benefits that I've laid out, we think it also has other significant benefits, in that it will allow us to accelerate, working in partnership with these other countries, the phase-out of the current PUREX technologies that are used around the world today, and the phase-in of more advanced proliferation-resistant recycling technologies.

Senator DOMENICI. That's why I asked. It would seem to me that the benefits are for them, too.

Mr. SELL. Indeed.

Senator DOMENICI. Because the benefit to the world is that we would—we might all be engaged in the most nonproliferation-active formulation of machinery, rather than what we've got now. And they ought to be beneficiaries, and we ought to help pay for it.

Mr. SELL. Mr. Chairman, we really believe that, through these technological advancements, we can make it commercially attractive to recover the economic value of spent fuel. And once we can do that, then that allows a international fuel leasing regime to work.

Senator DOMENICI. I'm going to just close by saying: When we talk about the dollar numbers, we have never talked about how much value added there is going to be in this process. That might

be the subject matter of maybe your doing some research and submitting to us: If this works, what is all that extra energy that we're going to have for sale? What is its value going to be? Because it's going to be somewhere, isn't it?

Mr. SELL. There will be a tremendous value of the electricity produced, and a tremendous savings by avoiding the cost of building nine Yucca Mountains over the course of the century. And, quite frankly, the engineering and the packaging required to dispose of hot spent fuel is much greater than that, that would be required to dispose of the more stable glacious waste form.

Senator DOMENICI. We'd get a whole lot more fuel to burn.

Mr. SELL. That's correct.

Senator DOMENICI. That's got a value added that this process is going to yield, right?

Mr. SELL. That's correct. And right now——

Senator DOMENICI. That would be very, very large. Huge amount.

Mr. SELL. It's a significant amount. And right now spent fuel that is headed towards Yucca Mountain still has over 90 percent of its energy value. And by developing recycling technologies, we think we can recover a great portion of that energy value and produce electricity with it.

Senator DOMENICI. We're going to be in recess. The Secretary's going to wait. Probably going to finish at 4 o'clock, or a little after 4 o'clock, if that's all right with you. But I won't be coming back, Mr. Secretary. But the Senator from Colorado will preside.

Thank you very much.

Mr. SELL. Thank you.

Senator ALLARD [presiding]. I'll call the committee to order. And, just for the record, I'm Senator Allard that's now presiding, at the request of the chairman, Senator Domenici. And I'd like to, again, welcome you, Mr. Secretary.

We were starting into the question part of the committee. I left early to go down and vote, and have now returned to wrap up our deliberations here on the committee.

GLOBAL NUCLEAR ENERGY PARTNERSHIP PROLIFERATION RISKS

I've had an opportunity to go and tour facilities in France, as well as in England, and what they do to reprocess nuclear fuel, which you indicated in your own remarks is—that it is technology that we had here in the United States, and then they adopted that technology. And, frankly, I am excited about the prospects of moving to UREX+ instead of PUREX. They use the PUREX technology. Am I correct on that?

Mr. SELL. That's correct.

Senator ALLARD. And so, I'm excited about the UREX+ policy. And it's my understanding, also, I just want to make sure that's on the record—is that it does take away the proliferation risks completely if we process that, or is there still some proliferation risk?

Mr. SELL. I think, from a public policy standpoint, Senator Allard, we must always be mindful of the proliferation risk anytime we are dealing with nuclear materials and nuclear technologies.

And so, I would be reluctant to suggest that any technology removes all risk, but we——

Senator ALLARD. But this lessens the risk, then, is that——

Mr. SELL. But the——

Senator ALLARD [continuing]. The plan?

Mr. SELL [continuing]. UREX+ technology prevents—it increases, substantially, the proliferation resistance of the material, to a point where this Government should be quite comfortable. And we would also build in the most sophisticated safeguards technologies into the UREX+ plant. So, not only do we have a much more proliferation-resistant stream of material coming out, but it would have the most advanced safeguards, and all of these plants would only be built, under our conception, in existing fuel-cycle states. So, we think this offers substantial nonproliferation benefits.

And there are two other nonproliferation benefits. By developing and deploying advanced burner reactors, and developing and deploying UREX+, we can begin to slow the accumulation worldwide of inventories of separated civilian plutonium, and we can build the capability that allows us to burn down and dispose of that plutonium. And then, thirdly, we can develop, we believe, an international regime, or we would seek to develop an international regime, that would discourage the investment and construction of enrichment and recycling facilities in countries that do not have them today.

Senator ALLARD. Now——

Mr. SELL. So, the——

Senator ALLARD. Go ahead.

Mr. SELL [continuing]. So, in sum, we think there are—from a systems standpoint, there are substantial nonproliferation benefits, and substantial nonproliferation enhancements, that would flow from the GNEP proposal.

Senator ALLARD. And I understand that right now, under UREX+ technology, we are working with two other countries. And that's France and Japan. Is that correct?

Mr. SELL. We have, through existing relationships that the United States has, we have been conducting tests and experiments and development work through funding provided by this committee. And we would seek to broaden the work to also include Russia, the United Kingdom, if they choose, Japan, and China. Those are the nations where well in excess—or around 70 percent of the world's nuclear reactors exist. Those are the nuclear economies of a sufficient scale to justify significant investments in advanced fuel-cycle technologies, and we would look to work with those countries in developing these technologies on an accelerated timescale.

INTERNATIONAL INTEREST IN ENRICHMENT SERVICES

Senator ALLARD. Now, Iran is on everybody's mind, because they've decided to build and operate a uranium enrichment plant, in direct violation, actually, of the Nuclear Proliferation Treaty. And with this capability, they could not only produce fuel for civilian purposes, but also weapons activity, as well. And you have a plan that calls for a uranium fuel leasing plan that would provide

fuel to countries interested in developing a civilian nuclear program.

Do you believe that other countries—we've already kind of—sounds like you've already begun to kind of form a coalition, but do you believe that these countries would be willing to contract for enrichment services instead of developing their own domestic capabilities?

Mr. SELL. We do, Senator Allard. And this is occurring now, on a smaller scale, around the globe. Many countries with significant nuclear power investments, like South Korea, have not made their own investments in enrichment and recycling. And the hope is—I mean, really, from a—from a world energy supply standpoint, and if we really want to address environmental concerns, pollution concerns with nuclear power, the world's going to need a significant expansion of nuclear power. And that's going to occur in many countries.

And we think a system could work, where states that have already made, or have economies that would justify significant investments in enrichment and reprocessing technologies, that we could lease fuel. So, a country like the United States could lease fuel to a country. And that fuel would then—would be burned in a reactor, but then taken back to be recycled and disposed of in the fuel-cycle country. We think that can be offered on attractive—we would propose that we could offer that on attractive commercial terms. So, there's a real incentive for a country, who is only interested in bringing the benefits of nuclear power to their economy, of leasing the fuel. And only those countries that are really seeking to—we would suggest that countries that chose not to go the more economic route, and, instead, choose to make investments in their own enrichment or recycling—or reprocessing capability, it would suggest that perhaps they have other motivations.

Senator ALLARD. And so, that's basically your plan. You're going to try and incentivize them with some economic alternatives. You hope that they'll not be able to refuse, because we would then have the original reprocessing plants constructed here. We'd do that them for them at a reasonable price, so that they'll use our facilities.

Mr. SELL. And it wouldn't just be here. It would also be in France or Japan or China or elsewhere. And it's—that diversity of suppliers to potential consumer nations would also give them the security, which I think countries would seek, in having a diversity of enrichment services suppliers.

Senator ALLARD. And have you gotten any firm commitments from any of the countries willing to come on with this program at this point? Or are you aware of real strong support for it? I'll put it that way.

Mr. SELL. When—a few weeks ago, I, with Under Secretary Bob Joseph from the State Department, traveled to London and to Paris, to Moscow, Beijing, Tokyo, and we also stopped to see Dr. El Baradei at the International Atomic Energy Agency, in Vienna. And we laid out our ideas and sought their consultation. And there was broad agreement on the objectives that the world needed a dramatic increase in nuclear power, that we should work together to develop advanced recycling technologies that did not separate

plutonium, that we should do this in international partnership, and that we should work to facilitate an international regime of fuel leasing so that we could discourage the proliferation of enrichment and reprocessing technologies.

There was broad agreement on all of those issues, and a great interest expressed by those governments in continuing to discuss with us how we could further the partnership.

NATIONAL NUCLEAR SECURITY ADMINISTRATION AND STATE DEPARTMENT PARTICIPATION IN GNEP

Senator ALLARD. Now, the GNEP program is a very comprehensive research and development program that includes work on advanced reactor technology, fuel recycling, waste reduction, and global nuclear fuel services, small reactors, and enhanced nuclear safeguards. And when we look at the budget, it seems to focus on large-scale engineering demonstrations of fuel recycling capability, with minimal involvement outside the Office of Nuclear Energy. And it's unclear, at least to me, from this budget, when the Department will undertake research, reliable fuel services, small-scale reactors, the enhanced nuclear safeguards, and basic research and development that could address a number of concerns related to our national security, particularly in the earlier phases of the program.

My question is: Why has the Department elected to minimize the direct and immediate engagement of the NNSA and the Department of State at the onset of GNEP?

Mr. SELL. With the greatest level of respect, Senator Allard, I have to disagree with the premise of your question. The National Nuclear Security Administration has been heavily involved, as has the State Department, as have other elements of the interagency policy formulating bureaus within the administration.

So, they have been involved. I think we have their—I know for a fact we have their strong support in moving forward on this.

There is an emphasis, in our budget request for 2007, on moving forward on the first key demonstration facility, which is the demonstration of the UREX+. That has been demonstrated at a laboratory scale. We think it is important, as quickly as possible, to demonstrate it on an engineering scale. And so, that does receive a significant portion of our—of the $250 million budget request for fiscal year 2007.

MIXED OXIDE (MOX) PROGRAM COST INCREASE

Senator ALLARD. I'd like to move on to the MOX Program. When I was chairman of the Strategic Subcommittee on Armed Services, we had some discussion with the MOX Program, where we have the recycling facilities at Savannah, Georgia. And, you know, it's—like was mentioned earlier, it's basically American technology that's been modified some, perhaps, by both the French and the Germans. But it's basically—was originally American technology.

I'm concerned about some reported overruns on the efforts down there. The IG did a report that said that cost increases may amount to $3.5 billion, where we were planning on $1 billion in the budget. Can you address that?

It seems to me we need to have somebody riding herd a little closer over the operation down there, and I'm wondering if perhaps maybe you could give us some insight on what's happening with the MOX facility in Savannah, Georgia.

Mr. SELL. Several years ago, after our country had made the agreement with the Russians to dispose of plutonium, we did make a decision to build facilities, MOX fuel fabrication facilities, as well as other processing facilities, at the Savannah River site. And, early on, it was suggested, at the time, that the cost of those facilities would be, in total, of—I may not have the numbers exactly right, but, on rough order, $2 billion.

That was not a very good number, obviously. And it is old. Commodity prices have increased significantly since that estimate was made. There was a failure by the Department and its contractor team to fully appreciate the costs that would be required to build that French MOX technology here in the United States. And there were other problems with the estimate. The Department is working to correct those.

I take seriously your counsel to keep a tighter rein on activities down there. But the plutonium disposition program remains an important U.S. objective, and we intend to move forward and accomplish that in as economically feasible a way as possible.

Senator ALLARD. Well, I do—I think that is very important. And, you know, you indicated cost of commodities was one of the factors. What other factors did we have that might have added to the cost of it?

And the rest of this question is: Did we have incentive-driven—did we have incentive-driven contracts with the contractor down there?

Mr. SELL. We—if I may, I would like to give a more complete answer on exactly what—the contract provisions that we have. I believe, as a general statement, that the contract does have significant incentives in it for contractor performance, but I would like to answer—give you a more complete answer on the record, if I may.

U.S. MIXED OXIDE FACILITY COSTS

Senator ALLARD. Yeah, that would be fine.

Mr. SELL. The other elements of the cost growth—and I—you know, part of it was commodity—the increased price of commodities. Part of it was simply that the $2 billion number was a 2000-year number, not a 2005 number. And there was also a failure, quite frankly, of the Department and our contractors to fully appreciate how costly it would be to build the French technology plant here in the United States. We made assumptions that we shouldn't have made, and those are costing us now.

Senator ALLARD. What specific assumptions—how did you—I mean, where were you wrong in your assumptions? I'm going to press you a little bit here.

Mr. SELL. I will—I can't—you know, unfortunately, I'm not prepared, today—or I don't have my mind today, Senator Allard, the exact things that we missed on this, but——

Senator ALLARD. Maybe you could get a memo to the committee on that, and we'll——

Mr. SELL [continuing]. But we will——

Senator ALLARD. Yeah.

Mr. SELL [continuing]. Follow up, in written detail, on that issue, if I may do that.

[The information follows:]

U.S. MIXED OXIDE FACILITY COSTS

The total project cost estimate for the U.S. MOX facility as reflected in the fiscal year 2007 budget request is $3.6 billion. However, the cost estimate and schedule will be formally validated prior to the start of construction as part of the Department's project management process, and reported to Congress. The reasons for the cost increase are: the 2½ year delay in the negotiation of the liability agreement with Russia resulting in the extension of the MOX construction schedule, further extension of the construction schedule to conform to the expectation of level funding in the outyears, unanticipated complexities in adapting French MOX technology to use weapon-grade plutonium, increases in the cost of construction materials since the original estimate was made, and the incorporation of more stringent regulatory and security requirements into the design of the facility. With regard to incentive driven contracts, DOE is negotiating multi-tiered performance incentives for the construction and operations phases of the MOX Project, which will contain a fee structure to control cost growth and schedule slippage.

Senator ALLARD. Yeah. We'd appreciate that so that we fully understand the issues down there.

And I'm one that would like to see these things carried in a timely manner, because I think when you start running into delay problems and accelerated costs, you tend to lose support within the Congress. And this is an important program, and I hate to lose that support. I——

Mr. SELL. The——

Senator ALLARD. Go ahead.

Mr. SELL. The delays—you know, even though this—the agreement was made to do this many years. It has taken a number of years, and—to get the appropriate agreements in place with the Russians. And when Secretary Bodman got to the Department, about a year ago, and realized that we still did not have the agreements that we'd been trying to get with the Russians that would allow this project to move forward, he and Secretary Rice engaged the Russians, and we were able to make significant progress on resolving issues as to liability which had prevented—which had really left this project in a stall for several years. So, we feel like we have finally made progress on that. The Department broke ground, finally, on the facility last fall. And we look forward to moving forward with it. But it, unfortunately, will be at a higher cost.

TRANSPORTATION FUELS

Senator ALLARD. Let me move on to our transportation fuels. I think we're all quite aware that the transportation sector is a huge consumer of energy in this country. And there's some concern about the high-temperature reactors that are effective in producing hydrogen for transportation. And where are we in the efforts by the Department to produce these kind of reactors that will allow for the production of hydrogen? Or is it just assuming that we're not far along on nuclear hydrogen research to—at this point in time, to be funding it? You have dropped—reduced your 2006 funding levels, and that's what's prompting this question.

Mr. SELL. It is our judgment at the Department that over the long term the President's Hydrogen Fuel Initiative that he laid out

in the—in his State of the Union of 3 years ago, offers significant promise for getting our transportation sector off of the internal combustion engine and onto electricity-based fuel cells. And we are—we have a broad program to develop those technologies, the storage technologies, the fuel-cell technologies, the automotive technologies, as well as the question of: How will we produce all of this hydrogen?

Today, the only economical way to produce hydrogen, or the principal economic way of producing it, is through reforming natural gas. But we think, in the future, as hydrogen demands increase significantly, we can produce it with coal, and we can also—and other technologies—and we think hydrogen will be—I mean, nuclear hydrogen will be a—nuclear power plants will be a significant technology producing hydrogen.

It is our judgment, I believe—and I will leave my statement to be revised by the technical experts—that the most promising nuclear technology for producing hydrogen is very high-temperature gas reactor. And a technology such as that, I believe, was authorized in the Energy Policy Act of 2005. It's referred to as the next-generation nuclear plant. And we have requested $23 million as part of our fiscal year 2007 budget to continue developing that reactor so that it can be demonstrated—built and demonstrated on a timescale consistent with that called for by the Energy Policy Act.

We think that technology can still be developed, and is moving along consistently with other portions of the Hydrogen Fuel Initiative.

Senator ALLARD. Well, why was there a reduction in your funding level for 2006?

Mr. SELL. If I may, I—that's another question I'll need to——

Senator ALLARD. Okay.

Mr. SELL [continuing]. Take for the record.

Senator ALLARD. Very good.

[The information follows:]

TRANSPORTATION FUELS

With an appropriation of $40 million in fiscal year 2006 and a $23.4 million budget request in fiscal year 2007, the Department has the level of funding needed to continue the progress necessary to inform a decision in 2011 on whether to proceed with construction of the NGNP. With these funds, the Department will continue the graphite particle fuels development effort, which is the critical path work for determining the feasibility of the technology for efficient electricity and hydrogen production. Sample fuel irradiation testing would begin in fiscal year 2007 as well as preparation for post-irradiation examination of the fuel.

ADDITIONAL COMMITTEE QUESTIONS

Senator ALLARD. I don't have any other questions. I have another committee meeting I've got to get to. And so, I'm going to request that the record remain open until close of business Friday for member statements and questions. And I also hope the Department will respond to these questions that are left open in a timely manner. Most committees I've been a part of have asked a response within 10 days. Is that about the time period that—if you can get your responses back to us within 10 days, we'd appreciate it——

Mr. SELL. We will do so.

[The following questions were not asked at the hearing, but were submitted to the Department for response subsequent to the hearing:]

QUESTIONS SUBMITTED BY SENATOR PETE V. DOMENICI

GLOBAL NUCLEAR ENERGY PARTNERSHIP (GNEP) PROLIFERATION CONTROLS

Question. The cornerstone of the GNEP is the development of a proliferation resistant fuel recycling plan that will reduce the amount of spent fuel that must be disposed of and recycle the uranium used in existing reactors.

Please explain to the committee what advantages this proposal has over existing fuel recycling programs and what steps the Department is taking to guard against the proliferation of separated plutonium.

Answer. Under study for the past 5 years, the Department believes that the Uranium Extraction Plus (UREX+) technology is the best known and proven. It provides for the group separation of transuranic elements (which include plutonium) contained in spent nuclear fuel and, therefore, would not result in a separated pure plutonium stream as is the case with current reprocessing technology. To impede diversion of material, this technology would use state-of-the-art safeguards approaches and advanced instrumentation to account for all the material used in the process. Incorporated early in the design, the combination of safeguards and the separation process ensures that material could not be easily diverted without being identified. Finally, an integrated set of fuel cycle facilities which include UREX+ would have the capability to manufacture fast reactor fuel and use an advanced burner reactor for permanent destruction of civilian inventories of pure plutonium. By demonstrating and deploying new technologies to recycle nuclear fuel, we would minimize waste, and improve our ability to keep nuclear technologies and materials out of the hands of terrorists.

GNEP—BUDGET SPECIFICS

Question. The GNEP program builds on the existing Advanced Fuel Cycle Initiative and provides $250 million in funding to initiate the research and development and to demonstrate the UREX Plus process, an advanced burner reactor, and an advanced fuel facility. This effort will not be easy and will require the support of our best scientific minds at all our national labs. However, this budget is not specific as to what activities will be funded and where this research will occur.

When will we know more about the specifics of the program?

Answer. The Spent Nuclear Fuel Recycling Program Plan is being provided to Congress by the end of May 2006 in response to fiscal year 2006 EWD Conference Report language and will provide additional specifics on the GNEP program. The report focuses on the plans for demonstration of the advanced recycling technologies on a scale sufficient to evaluate commercialization of the technologies.

Question. Will you be developing an R&D roadmap and develop a division of labor among the labs?

Answer. The Department has conducted an extensive amount of R&D under the Advanced Fuel Cycle Initiative program over the last several years to bring advanced technologies for enhancing the efficiency of the fuel cycle to a state of readiness for the engineering-scale demonstration. As previously discussed, the Department is currently preparing the Spent Nuclear Fuel Recycling Program Plan that will provide additional information. While Idaho National Laboratory is the lead laboratory for the GNEP Technology Demonstration Program, the participation by and capabilities of all of DOE's national laboratories are critical to the program's success. Nine national laboratories—Idaho, Argonne, Brookhaven, Lawrence Livermore, Los Alamos, Oak Ridge, Pacific Northwest, Savannah River and Sandia—have provided input into the Department's development of and vision for GNEP. These nine national laboratories are also currently involved in the preparation of work scope and funding requirements.

Question. I understand you will use funding provided in fiscal year 2006 to begin work on an Environmental Impact Statement for each of the three main facilities—where will they be located?

Answer. The Department has made no decisions with respect to locations for the engineering scale demonstrations of the advanced recycling technologies. The Department's fiscal year 2006 appropriation provided funding to initiate an Environmental Impact Statement (EIS) on recycling spent nuclear fuel. In March 2006, the Department initiated the National Environmental Policy Act (NEPA) activities with the issuance of an Advance Notice of Intent to prepare an EIS. The NEPA analyses

will inform a decision in fiscal year 2008 as to where the integrated recycling demonstration facilities would be located.

Question. How much will the GNEP program cost to implement and over what period of time?

Answer. A preliminary, order-of-magnitude cost estimate for the GNEP initiative ranges from $20 billion to $40 billion. This includes the cost of Nuclear Power 2010 and Yucca Mountain over the next 10 years as well as the cost of demonstrating integrated recycling technologies. Previously reported estimates for the cost of bringing the three technology demonstration facilities to initial operation range from $3 billion to $6 billion over the next 10 years. In 2008, the Department will have more refined estimates of the cost and schedule to complete the full 20-year demonstration effort. One of the primary purposes of the engineering scale technology demonstrations is to produce reliable estimates of the total life cycle cost of GNEP.

UREX+ RECYCLING PROCESS

Question. I traveled to France in December and received an update on the French spent nuclear fuel recycling program that is built on the U.S. developed "PUREX" process. The French separate Uranium which forms 95 percent of the volume of spent fuel. They also separate Plutonium which they recycle in a Mixed Oxide fuel that produces additional energy in their fleet of existing Light Water Reactors. I understand that although the volume of waste has been significantly reduced, the heat load would continue to drive the loading of a final repository. The Global Nuclear Energy Partnership initiative proposes additional research and development of a "Uranium Extraction plus (UREX+)" process to address the limitations of the PUREX process.

How would the UREX+ process address the limitations and provide a cost-effective, proliferation resistant alternative?

Answer. The transuranic product from the UREX+ process is more proliferation resistant than the product from current separations plants because there is no separated pure plutonium stream. The transuranic product provides a significantly higher radiation field than purified plutonium, and the TRU mixture is less attractive for diversion than pure plutonium.

A modern commercial UREX+ and fuel fabrication capability would be equipped with state-of-the-art monitoring and accountability systems specifically designed to prevent unauthorized access and diversion of materials. One of the advantages of an engineering scale demonstration of the UREX+ technology is the ability to demonstrate these monitoring and accountability systems.

Question. What are the milestones and costs associates with this research and development? What are the critical decision points?

Answer. The milestones and costs for various research and demonstration steps, including spent fuel separations process, are currently being developed. The Department's current efforts are aimed at conducting the applied research, engineering, and environmental studies that would be needed to inform a decision in 2008 on whether to proceed with detailed design and construction of the engineering scale demonstration facilities. The Department has set a goal of facility start-up between 2011 and 2015. A more detailed baseline cost and schedule are being developed as the project moves forward.

UREX CONSTRUCTION OPTIONS

Question. We notice that most of the UREX facility dollars in 2006 and 2007 (~$200 million) will be spent on "conceptual" designs, EIS studies, procurement orders, and other "paperwork" similar to that involved with constructing large-scale integrated nuclear facilities.

Are there any "medium" scale options available that could employ existing processing lab capabilities that could be utilized to free up funds for the other critical elements of the program? If not, how do you assure that the EIS process does not have to be repeated over and over for each component of the emerging fuel cycle?

Answer. The Department is looking at conducting additional laboratory research at increased throughput quantities in fiscal year 2007 in parallel with the conceptual design activities for the engineering-scale facility.

The EIS process will consider all reasonable alternative technologies and locations for three key elements of the GNEP Technology Demonstration Program: (1) demonstration of advanced spent fuel separations processes; (2) demonstration of a conversion of transuranics; and (3) demonstration of an advanced fuel cycle facility and advanced fuel fabrication.

IRAN—PURSUIT OF A COMPLETE FUEL CYCLE

Question. Iran has decided to build and operate a uranium enrichment plant in direct violation of Nuclear Non-Proliferation Treaty. Obviously, with this capability Iran could not only produce fuel for civilian purposes, but weapons activity as well. Your plan calls for a uranium fuel-leasing plan that would provide fuel to countries interested in developing a civilian nuclear program.

Do you believe countries would be willing to contract for enrichment services instead of developing their own domestic capability? How has this plan been received by other countries?

Answer. Today there are countries that rely on contracted enrichment services rather than developing their own domestic capability. Long-term contracts and enrichment facilities in over a half dozen countries provide alternative sources of supply. The United States itself contracts over half of its annual fuel services from Russia through the U.S./Russia HEU Purchase Agreement.

We recognize that some countries will be mindful of supply security under the GNEP approach. The United States has already committed 17 metric tons of HEU that will be blended down to LEU and used to establish a fuel reserve to back-up supply assurances. Russia has indicated support for such an approach. We are approaching other countries to establish interim supply arrangements to increase the confidence that critical energy supply would not be subject to near-term political tensions.

Question. What is the Department's plan to bring our international allies on board with the Global Nuclear Energy Partnership (GNEP)?

Answer. The United States has been meeting with potential international partners to discuss both policy and technical aspects of GNEP. We will continue our diplomatic and technical outreach with a broader group of prospective partners.

Question. What international commitments has the department obtained regarding GNEP?

Answer. The United States completed initial consultations with fuel cycle countries and the International Atomic Energy Agency on the key objectives of GNEP. From a technical perspective, France, Japan and Russia have expressed strong interest in cooperative R&D.

GNEP—NONPROLIFERATION

Question. The GNEP program is a comprehensive R&D program that includes work on advanced reactor technology, fuel recycling, waste reduction, a global nuclear fuel service, small reactors, and enhanced nuclear safeguards. However, the budget request focuses on large-scale engineering demonstrations of fuel recycling capability, with minimal involvement outside the Office of Nuclear Energy. It is unclear from this budget when the Department will undertake research reliable fuel services, small scale reactors, enhanced nuclear safeguards and basic R&D that could address a number of concerns related to our national security in the early phases of the program.

Why has the Department elected to minimize the direct and immediate engagement of the NNSA and the Department of State at the onset of GNEP?

Answer. Senator, as the principal official within the Department with responsibilities for advancing GNEP, I know that all appropriate elements of the Department were fully engaged during GNEP planning. In particular, Ambassador Brooks and the National Nuclear Security Administration (NNSA) staff played an integral role in the development of GNEP, in participation of addressing non-proliferation and the development of an advanced generation of safeguards technologies. This role will continue in the future.

The Department of State has also been engaged from the beginning of GNEP planning and involved in all aspects of developing our international partnership. As you may be aware, prior to the President's announcement of the Advanced Energy Initiative and GNEP, Under Secretary of State Robert Joseph and I led a delegation to several foreign capitals to present GNEP. This is but one example of our close cooperation with the Department of State in both the development of GNEP and corresponding diplomatic strategy. I can assure you that the Departments of Energy and State continue to be engaged in coordination of our activities to advance GNEP.

ADVANCED BURNER REACTORS

Question. The United States and the world have past experience with fast reactors that have led to questions about cost of operations and the potential proliferation threat. What will be the focus of advanced burner reactors and how will it address past concerns?

Answer. The focus of the advanced burner test reactor will be to demonstrate the capability of destroying transuranic elements (which include plutonium) with repeated recycle. The advanced burner test reactor will incorporate the very latest in safety and security features.

MOX PROGRAM

Question. Mr. Secretary, I am very concerned about the MOX program. This nonproliferation initiative uses the existing French recycling technology to fabricate nuclear fuel using a mixture of weapons grade plutonium (5 percent) and uranium (95 percent) to be burned in a civilian reactor. This program, when fully realized will destroy 68 tons of plutonium in the U.S. and Russian stockpiles. Can you please update the committee on the status of this program and the status of the liability agreement with Russia?

Answer. The Department of Energy has made significant progress in implementing the plutonium disposition program in the past year. The United States and Russia successfully completed negotiations of a liability protocol for the plutonium disposition program last summer. The protocol is currently under final review within the Russian Government. Senior officials from the Russian Ministry of Foreign Affairs and the Russian Atomic Energy Agency have assured us that there are no substantive issues with the agreed language and that it will be signed in the near future. In addition, the Department received authorization to begin construction of the MOX facility from the Nuclear Regulatory Commission, began irradiation of MOX fuel lead assemblies in a nuclear reactor, and began site preparation work at the Savannah River Site. Current plans call for construction of the U.S. MOX facility to start in 2006. To support this effort, the Department has been working on validating the U.S. MOX project cost and schedule baseline as part of our project management process and will have a validated baseline in place by the end of this year consistent with the requirements in the Defense Authorization Act for Fiscal Year 2006.

RISK INSURANCE—EPACT 2005

Question. The Energy Policy Act (EPACT) of 2005 authorized the Department to establish a risk insurance program that would compensate utilities if the Nuclear Regulatory Commission fails to comply with specific schedules or reviews or if litigation delays full operations. The Department has provided just $2 million to support the establishment of the program regulations.

What is the timing of standby support program? When will the regulations be finalized and the program become operational?

Answer. The Department is developing a rule for implementing the standby support or Federal risk insurance provisions of EPACT. The rulemaking is scheduled to be completed by August 2006 in accordance with the requirements of EPACT. The Department issued the interim final rule on May 8, 2006.

GLOBAL RISK LIABILITY PROTECTION

Question. Part of the GNEP plan is a global nuclear solution and international collaboration on new advanced reactors. The administration has negotiated the Convention on Supplemental Compensation for Nuclear Damages in 1997 and submitted it to the Senate in 2002. This program is an international liability standard similar to Price Anderson. The Senate Foreign Relations Committee held hearings in 2005, but no action has been taken. I am told that most U.S. nuclear companies are very reluctant to embark upon foreign work without such a liability agreement in place.

Has the administration considered the impact that a lack of an international regime on nuclear liability will have on their international nuclear initiatives, such as GNEP?

Answer. Nuclear liability comes up as an issue in connection with almost every nuclear project outside the United States—whether it is a commercial project in which a U.S. nuclear supplier wants to participate or a DOE activity undertaken by a contractor. The United States has sought since the early 1990's to address these concerns in a comprehensive manner through the establishment of a global nuclear liability regime that includes the United States. These efforts culminated in the adoption of the Convention on Supplementary Compensation for Nuclear Damage (CSC) in 1997 at a Diplomatic Conference under the auspices of the International Atomic Energy Agency (IAEA). The United States was the chief proponent of the CSC since it is designed to address U.S. concerns over nuclear liability in a manner that will not require the United States to make any substantive change in our domestic nuclear liability law (the Price-Anderson Act). Bringing the CSC into

effect will establish a well-defined legal framework for dealing with nuclear liability issues in a manner that facilitates participation by U.S. firms in nuclear projects (including those associated with GNEP) and, in the unlikely event of a nuclear incident, provides for assured, prompt and meaningful compensation with a minimum of litigation.

The administration strongly supports ratification of the CSC by the United States and other countries as soon as possible. The administration has submitted the CSC to the Senate for advice and consent and has indicated that favorable action early this year is a high priority. The administration also has been working with the IAEA to promote ratification of the CSC by other countries. In particular, the Department represents the United States on INLEX, the IAEA's group of nuclear experts, whose mission includes promoting broad adherence to the CSC. In addition, the Department participated last November in an IAEA forum in Australia to promote ratification of the UCS by Pacific Island and Asian countries and will participate in a similar forum for Latin American countries later this year.

UNIVERSITY R&D PROGRAM

Question. This budget proposes to eliminate the funding for University programs to support nuclear education and encourage students to focus on nuclear related disciplines which have civilian and defense capabilities. You might be interested to know that the Nuclear Regulatory Commission, following authorization of EPACT, did include funding in its budget to develop an academic capability needed to perform oversight responsibilities.

Why do you believe there is a policy disconnect between the NRC and the DOE when it comes to supporting nuclear education?

Answer. We do not believe there is a policy disconnect between NRC and DOE. The NRC's support to universities is for the purpose of attracting engineering students to the NRC for employment opportunities. The DOE objective was to address the issue of declining student enrollments in, and closure of, university programs during the 1980's and 1990's. Over the last few years, there has been a significant increase in student enrollments in nuclear engineering programs, achieving the Department's goal of enrollments of 1,500 students. During the same time, the number of nuclear engineering programs in the United States has increased as well. We believe that a strong nuclear engineering education infrastructure is in place and that the efforts of the universities and industry as well as continued demand for nuclear engineers will sustain enrollments and nuclear engineering programs.

While the Department of Energy has not requested specific funding for the University Reactor Infrastructure and Education Support Program, we will continue to fund research at nuclear engineering schools through our directed research programs and awarded through the Nuclear Energy Research Initiative. In May 2006, the Department anticipates issuing a solicitation to universities requesting proposals for participation in the Office of Nuclear Energy's research and development. In addition, we anticipate continuing fellowships to graduate students pursuing advanced degrees in transmutation and other highly specialized fields associated with the fuel cycle.

NUCLEAR POWER FOR TRANSPORTATION FUELS

Question. GNEP is focused on enabling nuclear power for electricity generation. However the transportation sector is the largest consumer of energy in the country. With GNEP's emphasis on fuel recycling and fast-neutron burner reactor development, I am concerned support for high temperature reactors that are effective in producing hydrogen for transportation will be overlooked or forgotten entirely. For example funding for nuclear hydrogen research has been reduced from fiscal year 2006 levels.

How do we ensure that we don't abandon the research needed to produce transportation fuels with nuclear energy and support a balanced approach to solving our dependence on foreign oil?

Answer. The Department has not abandoned research needed to produce transportation fuels with nuclear energy. Authorized by the Energy Policy Act of 2005, the Next Generation Nuclear Plant program is on track to meet the 2011 date to select a technology best suited to apply heat and/or electricity to produce hydrogen at a cost competitive with other transportation fuels.

GNEP REGULATION

Question. I understand the DOE plans to "self-regulate" the facilities that will be developed to conduct research and development. Ultimately a commercial-scale facil-

ity will be developed, assuming the research is proven, and the NRC will need to perform the ultimate licensing of such a facility.

As you may know, the NRC has not requested any funding to support the GNEP program—has an agreement been reached with the NRC that defines their involvement?

Answer. DOE would conduct the GNEP technology demonstration program under authority granted by the Atomic Energy Act. However, DOE would propose to engage the Nuclear Regulatory Commission (NRC) throughout the technology demonstration phase to ensure that the technologies are licensable by NRC when they are deployed commercially.

YUCCA MOUNTAIN OPTIONS

Question. Because of the large volume of spent nuclear fuel already produced and the large infrastructure of treatment facilities and burner reactors needed to deal with it, the GNEP program will take several decades to have any impact on our high level waste problem. There are a variety of opinions on Yucca arguing for delay in licensing Yucca Mountain, even though a repository for high level waste will be needed with or without GNEP. Others say that Yucca Mountain is needed right away for Navy fuels and to dispose of high level waste now stored at many DOE facilities from our cold war weapons program. Still others say that GNEP may fail and so the United States must actively pursue Yucca Mountain for spent nuclear fuel to ensure that we do not foreclose that disposal option.

What is your view on this and the approach we should take with Yucca Mountain?

Answer. The country needs Yucca Mountain under any fuel cycle scenario and this administration is committed to the successful licensing and operation of the site. Even with a fully successful GNEP development and implementation, the residues from the recycling process will still need geologic disposal. In addition, approximately 13,000 metric tons of Department of Energy (DOE) vitrified high-level waste and DOE spent nuclear fuel could not be recycled and still requires a repository. Moreover, the applicability of GNEP technologies for commercial spent fuel over 15 years old is still uncertain. The government has the obligation to take and dispose of the Nation's waste, and our mission is to provide permanent geologic disposal under the Nuclear Waste Policy Act of 1982. We need to start fulfilling that responsibility now with respect to the 50,000 metric tons of commercial spent fuel already generated and the additional 2,000 metric tons being generated annually.

While the potential waste minimization benefits of GNEP on Yucca Mountain would be profoundly positive, any changes to the operation of the Yucca Mountain repository would occur only after GNEP technologies have been adequately demonstrated. Today, there will be no changes in the license application under development and we will proceed with our current plan for the existing waste inventory as well as the waste being generated.

LEGISLATIVE REFORMS

Question. The administration is preparing a package of legislative reforms modifying the authorization for Yucca Mountain. Among the many modifications, the proposal seeks to stage the emplacement of spent fuel to allow it to cool.

How will this strategy impact long-term storage and how will it be coordinated with the GNEP recycling efforts?

Answer. Repository designs have consistently included aging capability needed to allow the spent fuel received from the utility sites to cool until it is suitable for permanent underground disposal. These aging facilities are an integral part of our disposal operations. Although GNEP offers the promise for a more efficient fuel cycle in the future because it generates a lower volume of waste, there are no current plans to store existing spent fuel for the possibility of recycling it in the future.

Question. Can you please explain why the Department has decided to make these modifications to the Yucca Mountain project now and what impact this will have on schedule and budget estimates?

Answer. Since the Department had always intended to have spent fuel aging capability deployed at the repository, the availability of early spent fuel aging facilities would not impact current repository planning. Cost and schedule development is currently underway for the clean-canistered approach to repository waste receipt announced last October, and will be available later this year.

WASTE CONUNDRUM

Question. As you are probably aware the construction of 19 new reactor projects are under discussion and this will add to the existing large volume of waste waiting

final disposal. By 2010, the amount of spent fuel stored at reactor sites across the country will exceed the statutory limit of 70,000 tons of spent fuel that can be placed in Yucca Mountain. If the NRC agrees to extend the license of all existing reactors this will generate up to 120,000 tons of spent fuel, which is the "technical" capacity of the mountain. This doesn't begin to address spent fuel generated from new reactors.

If we do not address the large growing volume of spent fuel through a waste reduction strategy proposed through GNEP, how will we deal with all the spent fuel?

Answer. If the volume reduction benefits of GNEP are not realized, it will be necessary for the Department to develop additional repositories to deal with all the spent fuel that is expected to be generated by the current fleet of reactors as well as the additional new reactors currently being considered. Removing the statutory limit of 70,000 metric tons currently imposed on disposal at Yucca Mountain will temporarily delay the need for the next repository. The combination of waste minimization and removing the 70,000 metric ton limit could delay the need for another repository until the next century.

INTERIM STORAGE

Question. Some have proposed that we move our spent fuel to a central interim location, or locations, until it can be processed in a recycle facility. Others fear that once moved, the fuel will remain there forever, especially if recycling proves to be technically impossible or commercially unviable.

What assurances could be provided to a host community for temporary storage that it won't be stuck with the fuel from a hundred reactors forever?

Answer. The Department has made no decisions regarding the timing for receiving spent fuel for recycling, or the locations at a recycling site where the spent fuel would be recycled. It is anticipated that the approach to receiving spent fuel will be examined as part of the project definition and conceptual design phase that will occur over the next 2 years.

Question. In the fiscal year 2006 Conference Report Congress directed the Department to develop an interim storage plan and provide grant funding to communities interested in locating such a facility in their area. There are communities in my State that are very eager to work with the Department and to initiate the siting process. When will the Department complete its plan for the interim storage facilities and when do you expect to release the funds to interested communities? What direction will you give these communities on the expenditure of these funds?

Answer. The fiscal year 2006 Conference Report directed the Department to address the development of an integrated spent fuel recycling facilities. The Department received over 30 responses from public and private sector interests in response to a Request for Expressions of Interest issued in March 2006 for hosting advanced recycling facility demonstrations. The Department expects to issue a Request for Proposals later this spring and award contracts this year to conduct site evaluation studies. The Department has initiated an Environmental Impact Statement for the GNEP Technology Demonstration Program that will consider locations for siting the integrated recycling demonstration facilities. The results of the site evaluation studies will help inform the evaluation of potential locations. At this time, the GNEP Technology Demonstration Program does not contemplate a dedicated interim storage facility for spent fuel.

GNEP—ENGINEERING DEMONSTRATION

Question. GNEP is focused on a near-term visible demonstration of the closed fuel cycle and has chosen the Engineering Scale Demonstration (ESD) at the Savannah River Site in South Carolina (SRS). However, before the Department proceeds with the construction of the UREX+ demonstration to recycle fuel it is important that the Department is able to confirm that the fuel itself can be manufactured and qualified in a reactor.

Before the Department undertakes a complicated construction project, are you absolutely confident that this technology will deliver a product that can be used and safely disposed in a fast reactor?

Answer. No decision has been made regarding the location or locations for the GNEP technology demonstration projects. Technical challenges do exist in the areas of the separation of spent nuclear fuel, manufacture of new fuel from recycled products, and the destruction of the long-lived radioactive materials in a nuclear reactor. These challenges will be addressed both through continued applied research and the new demonstration facilities.

Question. Without a fast reactor available in this country, how will you test and qualify the fuel to determine whether or not you have a viable product?

Answer. The transmutation fuels could be tested and qualified in existing fast reactor facilities which are available internationally in Japan, France, and Russia.

DOE—COLLABORATIVE R&D

Question. Traditionally, the Department hasn't always been successful in fostering cooperative research among the offices within the Department. There are relevant projects across the different repository, nuclear energy, science, and non-proliferation programs that can be integrated to take advantage of complimentary assets and related developments. For example, the NNSA has started constructing new MOX fuel production and fabrication facilities.

How will these parallel efforts be used to accelerate the GNEP program?

Answer. The Office of Nuclear Energy is the lead office for managing the GNEP program. In this capacity, NE will work with all of the relevant program offices, including the Office of Civilian Radioactive Waste Management, which has primary responsibility for the geologic repository; the Office of Science, which will be involved in simulation, research and development; and the National Nuclear Security Administration, which will serve a key role in developing advanced safeguards for the advanced recycle facilities. The Department will seek to ensure that the lessons learned for the NNSA MOX program are appropriately applied to the GNEP program.

RELIABLE FUEL SUPPLY

Question. GNEP has proposed that the United States and several other countries should join together to supply nuclear reactors and fuel to the rest of the world. Late last year, the Secretary committed to down blend 17.4 tons of highly enriched uranium to establish the initial supply of available fuel. The budget documents are unclear as to how the cost of down blending the fuel will be paid and the timetable and terms of this activity. In addition, it is unclear if the Department has the authority to undertake this activity. Can you please provide for us a budget and schedule for the down blending activities and identify the existing authorities the Department will use to down blend this material in order to establish a Reliable Fuel Supply.

Answer. The HEU is to be down blended at a commercial facility in the United States that will be selected through a competitive procurement. The current schedule is to issue a request for proposals in April 2006, award a contract this summer, and begin shipments of HEU to the winning bidder by the end of the fiscal year. Shipments will continue through fiscal year 2008. Down blending of the HEU at the commercial facility is to be completed by the end of 2009.

Funding is needed to recast metal at Y–12 National Security Complex into a form suitable for shipment to the down blending contractor, package the HEU for shipment to the contractor, and develop and procure new shipping casks. The funding estimate for this work is approximately $9 million in fiscal year 2006, $15 million in fiscal year 2007, and $8 million in fiscal year 2008. However, the Department of Energy proposes that the cost of down blending, including chemical processing to remove non-uranium constituents and procurement in the market of natural uranium blend stock, be paid for by allowing the contractor to retain a fraction of the resulting LEU. It is estimated that it will take approximately 70 MT of LEU ($130 million at current prices), leaving approximately 220 MT available for the Reliable Fuel Supply.

The Secretary has authority under the Atomic Energy Act of 1954 (AEA) and the USEC Privatization Act to enter into barter transactions with regard to uranium. Under section 3(d) of the AEA, the Secretary is to effectuate programs that encourage the "widespread participation in the development and utilization of atomic energy for peaceful purposes." Under section 54 of the AEA the Secretary is authorized to export special nuclear material, including enriched uranium, under the terms of an agreement for cooperation arranged pursuant to section 123 of the Atomic Energy Act, consistent with the requirements of section 3112 of the USEC Privatization Act. Under section 55 of the AEA the Secretary is "authorized, to the extent [he] deems necessary to effectuate the provisions of this Act" to purchase or otherwise acquire special nuclear material. Section 3112(d) of the USEC Privatization Act authorizes the Secretary to "sell natural and low-enriched enriched uranium (including low-enriched uranium derived from highly enriched uranium) from the Department of Energy's stockpile" where determinations are made that the material is not necessary for national security needs and that the sale will not have an adverse material impact on the domestic uranium market, and where the price paid is not less than the fair market value of the material. The HEU in question was declared excess to national security in 1994. The Secretary signed a determination that this

activity would not have an adverse material impact on the domestic uranium industries on November 4, 2005.

QUESTIONS SUBMITTED BY SENATOR THAD COCHRAN

CONSTRUCTION OF NEW NUCLEAR POWER PLANTS

Question. Congress has consistently supported the administration's efforts to promote the use of safe and clean nuclear energy. In last year's appropriations bill, this committee provided even more funding than was requested by the Department. Also last year, the Senate, under the leadership of Chairman Domenici, passed landmark energy legislation, including a provision requested by the administration to provide additional incentives, including risk insurance, for new commercial nuclear power plants. My State is a leading site to host a new commercial nuclear power plant, which will not only provide jobs and stimulate economic development, but also could provide future rate relief to my State's electricity consumers, by relieving some of the burden of high cost natural gas currently used to generate electricity.

Within the context of the proposed Global Nuclear Energy Partnership, does the administration remain strongly committed to fostering the development of new commercial nuclear power plants in the United States?

Answer. The administration is and remains strongly committed to the development, licensing, and deployment of new nuclear power plants in the United States. GNEP will build on the recent advances made by the President and Congress to stimulate new nuclear plant construction in the United States. This will be accomplished by demonstrating the success of the streamlined regulations for siting, constructing, and operating new nuclear plants through the Nuclear Power 2010 program, and by implementing incentives enacted by the Energy Policy Act of 2005 (EPACT 2005). The Nuclear Power 2010 program is a high priority at the Department of Energy for the near-term deployment of new nuclear power plants. This key program is the joint industry and government collaborative effort to address the barriers to deployment of new nuclear power plants in the near-term.

NUCLEAR POWER 2010

Question. Why does the budget propose to reduce funding for Nuclear Power 2010 program, which is the principal DOE program to support the deployment of new commercial nuclear power plants on a fast track?

Answer. The proposed budget for the Nuclear Power 2010 program was reduced due to the projected uncosted fiscal year program carryover into fiscal year 2006 and fiscal year 2007. Uncosted carryover can be attributed to the delay in initiation of the two New Nuclear Plant Licensing Demonstration projects with NuStart Energy Development LLC and Dominion Energy, the slower than expected ramp-up by one reactor vendor and an additional $10 million fiscal year 2006 appropriations over the budget request.

Although we are optimistic that the industry will be able to move work forward and accelerate project spending; we believe that with these uncosted balances the work that needs to be done to keep these projects on schedule will be able to be accomplished.

Question. Isn't this posture inconsistent with the plans and the significant budget increase requested for GNEP?

Answer. The reduced fiscal year 2007 budget request for the Nuclear Power 2010 program is consistent with the originally planned work scope taking into consideration prior year carryover. The overall goals and outcomes of the Nuclear Power 2010 program will support the overall GNEP plan.

Question. If this committee decided to restore the proposed funding cutback for the NP2010 program, would this not enable the Department to work with industry nuclear power plants?

Answer. The President's budget request for the Nuclear Power 2010 program will support the project activities as originally planned considering the program carryover expected at the end of fiscal year 2006.

YUCCA MOUNTAIN

Question. Yucca Mountain is critical and the Global Nuclear Energy Partnership program must always keep Yucca Mountain as a critical component. Please elaborate on your testimony on the ways we need to move forward with the licensing and construction of the Yucca Mountain repository regardless of GNEP.

Answer. The administration is committed to the development of Yucca Mountain with or without the Global Nuclear Energy Partnership (GNEP). Under any fuel

cycle scenario, there will be a need for Yucca Mountain for the permanent disposal of waste.

The Department needs to move forward with the licensing and construction of Yucca Mountain that embodies the Secretary's direction for safer, simpler, and more reliable operations. We need to ensure that the license application process is based on sound science and that we demonstrate through our actions that we have met the quality assurance requirements of a nuclear licensee. In that regard, the Department is conducting additional work for the submittal of the license application to address the amended draft Environmental Protection Agency Radiation Protection Standards to extend the period of compliance from 10,000 to 1 million years as well as accommodate clean-canistered approach to spent fuel handling operations. Additionally, the Department is working with the Nuclear Regulatory Commission (NRC), industry and the utilities to develop the specifications for a canister that can be added to the license application materials.

In order for the Department to receive a license from the NRC, it must demonstrate that it can operate under nuclear standards and requirements. This involves the establishment of a culture of credibility and integrity that earns respect regarding how it operates. We will also be investing significant time and resources in developing this culture.

QUESTIONS SUBMITTED BY SENATOR HARRY REID

ECONOMICS

Question. DOE repeatedly has stated that it is premature to develop a cost estimate for the GNEP program. But the National Academy of Sciences presented cost estimates in 1996 based on several different fuel cycles, including one based on actinide-burning fast reactors, and DOE developed a very detailed cost estimate for the Accelerator Transmutation of Waste program in 1999. If DOE believes that these estimates are no longer appropriate, why can't it show exactly why that is the case?

Answer. In 1996, the National Academy of Sciences (NAS) published a study entitled "Nuclear Waste: Technologies for Separations and Transmutation." This study was technically very complete, and incorporated most technical knowledge available at the time. Cost studies used data available in the early 1990's, in particular for the cost of construction and operation of large separations plants, and focused mostly on data from then recently-built reprocessing plants in Europe. Data available in 2006 is significantly different due to two factors: first, operational experience developed within the French program since that report was written indicates several ways to very significantly reduce the cost of reprocessing; secondly, data available from research performed under the auspices of the Advanced Fuel Cycle Initiative point to new technologies that will significantly reduce the footprint—and therefore the cost—of reprocessing facilities.

Furthermore, the NAS report was developed at a time when the prospect for nuclear energy growth was low, and when cheap oil was plentiful. Under these conditions, its cost analysis ignored several benefits of implementing separations and transmutation strategy, namely the possibility of avoiding additional repositories beyond Yucca Mountain, and the global peace dividend associated with a stable, proliferation resistant global nuclear enterprise.

The Department of Energy (DOE) study on the cost of implementing an Accelerator Driven Transmutation of Waste infrastructure, published in 1999, indicated very high costs associated with using an accelerator approach, which has since been abandoned in the United States, and has been seriously scaled back in Europe and in Japan. Both France and Japan are now proposing long term approaches similar to the technical approach proposed by the Global Nuclear Energy Partnership (GNEP) initiative.

A full lifecycle economic analysis for the technologies proposed within the GNEP program is underway.

Question. Given a flat budget overall for DOE, what related programs are you giving up to pursue this program?

Answer. In fiscal year 2006, Congress appropriated $79.2 million (which includes the across-the-board rescissions) for the Advanced Fuel Cycle Initiative (AFCI). The Department is requesting $170.8 million in new funding to accelerate efforts to develop and demonstrate the advanced recycling technologies. The funding request is part of a broader prioritization of DOE program activities affecting not just AFCI but other programs within the Department.

Question. What are the estimate costs according to the GEN IV program for the design of fast neutron reactors?

Answer. The Generation IV program does not have a specific cost estimate for the design of fast reactors. These costs will be estimated over the next 2 years as the Department prepares the conceptual design of the advanced burner reactor and works to develop a baseline schedule and cost for demonstration of the technology. Under the Advanced Fuel Cycle Initiative, the Department would propose to invest $25 million on the advanced burner reactor technology in fiscal year 2007. However, as with the design of any complicated system, more definitive estimates will be developed as the design details are developed.

In February 2006, the United States signed a Generation IV systems arrangement agreement with the Commissariat a L'Energie Atomique of France and the Japan Atomic Energy Agency to cooperate on the development of sodium fast reactors. It is anticipated that this agreement will establish the foundation for further collaborations on fast reactors with these countries, and others that are expected to join the agreement in the future, in support of GNEP.

Question. How many existing reactors in the United States could use MOX fuel? How many would require costly retrofits?

Answer. About 25 percent of the current light water reactors in the United States could use MOX fuel, while another 50 percent would require retrofits. The Global Nuclear Energy Partnership initiative does not propose to use MOX fuel; but would propose to develop a more advanced and proliferation resistant fuel.

Question. How much of the $250 million requested for fiscal year 2007 is new money, and how much is re-categorized spending?

Answer. The Global Nuclear Energy Partnership is a new initiative that proposes to accelerate work underway within the Department's Advanced Fuel Cycle Initiative (AFCI) to develop more advanced proliferation resistant spent fuel recycling technology. In fiscal year 2006, Congress appropriated $79.2 million (which includes the across the board rescissions) for AFCI. In fiscal year 2007, the Department has requested $170.8 million in new funding to accelerate development and demonstration of the advanced recycling technologies that are part of GNEP.

Question. What are your key technical hurdles to implementing a system of reprocessing? How confident are you that you can develop reasonable cost estimates for overcoming these hurdles (given the Department's poor track record on costing out large, complicated projects)?

Answer. The major technical challenges are in the areas of the separation of spent nuclear fuel and the manufacture of new fuel from recycled products. Both of these challenges will be addressed through continued applied research and technology development. The Department will conduct engineering design and environmental studies over the next 2 years that will support the preparation of baseline costs and schedules for the demonstration of the separations of spent nuclear fuel, burning of the transuranics, and the development of a fast burner test reactor. We are confident that the work and efforts will provide the required information to support these baselines.

INTEGRATED INTERIM STORAGE/REPROCESSING

Question. In DOE's budget request for the GNEP program, the following statement is made under the heading of "Detailed Justification" for "Systems Analysis":

"In fiscal year 2006, the Department will focus its systems analysis efforts on evaluating the integrated fuel cycle system it has chosen to demonstrate at engineering scale. It will develop a plan for integrating a spent fuel recycle capability with interim storage of commercial spent nuclear fuel and complete an assessment of the proliferation resistance of certain aqueous separations technologies. This 'Spent Fuel Recycling Plan' will be submitted to Congress as requested in the fiscal year 2006 Appropriations language."

Can DOE explain what is meant by "interim storage" in this context?

Answer. Interim storage refers to the range of possibilities of storage of spent fuel from the time it is discharged from a reactor until it is separated. The Department has made no decisions regarding the timing for receiving and storing spent fuel that would be incidental to recycling or the locations for the spent fuel recycling demonstration facilities. It is anticipated that the approach to receiving and storing spent fuel incidental to recycling will be examined as part of the project definition and conceptual design phase that will occur over the next 2 years.

Question. What sites are under consideration for such interim storage?

Answer. The Department is not presently considering sites to be used solely for interim storage as part of a recycle strategy. Future site evaluation studies will identify the sites to be considered for recycling demonstration facilities and will con-

sider the extent to which such sites have the capability to provide storage related to the recycling process.

Question. What criteria will you use for identifying potential sites?

Answer. The Department has not yet developed criteria that would be used to identify potential sites for spent fuel recycling demonstration facilities.

Question. Are foreign sites under consideration?

Answer. We do not anticipate using foreign sites to store U.S. spent fuel.

Question. What analysis will be made about the costs of interim storage on-site as compared with interim storage at Yucca Mountain as compared with pool or dry-cask storage at potential reprocessing sites?

Answer. The Department has not conducted analyses comparing costs of interim storage onsite to storage that is incidental to demonstration of advanced recycling technologies. The Department does not view process storage in connection with the GNEP Technology Demonstration Program as a means of fulfilling its existing responsibility to take and dispose of the spent fuel currently being stored at reactor sites.

SPENT FUEL RECYCLING PLAN

Question. What offices will lead on the production of this report in the DOE and what other offices within DOE or what agencies will be involved?

Answer. The spent fuel recycling plan will be developed by the Office of Nuclear Energy (NE). NE has the lead in developing and managing the Global Nuclear Energy Partnership initiative. NE is assisted by the Office of Civilian Radioactive Waste Management, which has primary responsibility for the geologic repository; the Office of Science, which is involved in simulation and basic research; and the National Nuclear Security Administration, which serves a key role in advancing non-proliferation, developing advanced safeguards for the recycling demonstration facilities, and in developing the fuel services component of GNEP.

Question. Will a "threat assessment" be a part of this plan?

Answer. The plan will identify what assessments must be done to enable recycling of spent fuel. Those assessments will cover safety, environmental, proliferation resistance, and physical protection of radioactive materials in accordance with laws, regulations, and DOE Orders.

Question. What opportunities for public involvement will be there in the drafting of this plan?

Answer. The Department anticipates delivering the spent fuel recycling plan to Congress by May 31, 2006. There will be extensive opportunities for public involvement in conjunction with the National Environmental Policy Act (NEPA) analyses of alternatives for facilities envisioned as part of the GNEP Technology Demonstration Program.

Question. In what ways will the DOE produce this report in order to ensure compliance with NEPA?

Answer. The Department remains committed to meeting the letter and the spirit of NEPA and will conduct a thorough review of the environmental impacts of appropriate alternatives. On March 22, 2006, the Department issued an Advance Notice of Intent (NOI) announcing its intent to prepare an Environmental Impact Statement for the GNEP Technology Demonstration Program. The Report to Congress is separate from this NEPA review and sets forth DOE's present vision for the GNEP Technology Demonstration Program.

Question. How will this assessment affect the continued preparations for opening Yucca Mountain?

Answer. The spent fuel recycling plan will articulate the Department's plan to demonstrate an integrated fuel cycle at a scale appropriate to determine the feasibility of full scale operations. The development and implementation of this plan does not affect the Department's continued preparation for licensing, construction and operation of Yucca Mountain. A geologic repository is a necessity under all fuel cycle scenarios, and the Department's budget request of $544 million relating to Yucca Mountain will allow us to make steady progress on Yucca Mountain. The administration is committed to begin operations at Yucca Mountain repository as soon as possible so that we can begin to fulfill our obligation to dispose of the approximate 55,000 metric tons of spent fuel already generated and the approximate 2,000 metric tons being generated annually. We have no plans to delay disposal of this spent fuel until full scale recycling facilities are available.

Question. To what extent will this report assess the economic implications of future fuel cycle activities?

Answer. The Spent Nuclear Fuel (SNF) Recycling Program Plan addresses the near-term costs of the GNEP Technology Demonstration Program. The report, which

is being provided to Congress in response to fiscal year 2006 Energy and Water Development (EWD) Conference Report language, does not assess the economic implications of the future fuel cycle activities or technologies. The report focuses on the demonstration of the advanced recycling technologies on a scale sufficient to evaluate potential commercialization of the technologies. System analyses are part of this plan as we go forward and will assess the full economic implications of advanced spent nuclear fuel recycling.

WASTE

Question. How much and what kind of waste would be produced by reprocessing? By transmutation?

Answer. The volume and quantities of waste from reprocessing and transmutation are not known in detail today, since they will depend not only on process design considerations but also on the results of tests performed with the GNEP demonstration facilities. For example, no one has operated a fast burner reactor with transuranic fuel and the technical results from engineering-scale treatment of that spent fuel for further recycle will be available for the first time in approximately 15 years. In the meantime, laboratory scale tests will be performed using irradiated specimens from foreign fast test reactors (PHENIX in France and JOYO in Japan). Regardless of the processes finally chosen, there will be no high level liquid waste products.

From the UREX+ separations plant, approximately 94 percent of the products will be highly purified uranium which will probably be stored for use as fuel in future fast power reactors. If it is judged to be surplus, it would be classified as a low level waste and disposed of by shallow burial. Approximately 25 percent by weight of the spent fuel going to a UREX+ plant is fuel cladding and end pieces. It will be compressed and disposed of as high level waste. A small amount of the cladding will be used to form an alloy with the fission product technetium for disposal in the same metal waste container.

The fission product iodine will be collected from the dissolver off-gas, placed in a stable waste form and placed in the repository. Cesium and strontium will be separated, converted to an alumino-silicate waste form and stored for approximately 200 years, by which time it will be a low level waste and disposed of by shallow burial. The remaining fission product, constituting approximately 5 percent of the spent fuel, will be mixed with borosilicate glass (with up to 50 percent of the final glass logs being fission products) and disposed of at Yucca Mountain.

The transuranics in the spent fuel, constituting approximately 1.1 percent by weight, will be blended with fresh make-up uranium and converted to fuel for the fast test reactor. Recycle through fast burner reactors will result in a small quantity of fission product and process losses being removed from the processing system each cycle. The material will be formed into an inert waste form for disposal. The total quantities will be a very small fraction of the quantity of spent fuel entering the UREX+ processing plant (which under the current once-through fuel cycle, would go directly to Yucca Mountain). Thus the overall quantities and heat loads of the final waste will be reduced greatly, allowing the technical capacity of the Yucca Mountain to be substantially increased.

Question. Does DOE envision inviting other countries that we don't want to reprocess to ship their spent fuel to the United States? Could DOE provide a list of the countries whose spent fuel we would be accepting and reprocessing?

Answer. We do not envision accepting spent fuel pursuant to the GNEP vision until there is sufficient advanced recycling capability available in the United States. At that time, we would have to consider the conditions under which the United States would reprocess another country's spent fuel. To meet nonproliferation objectives, the United States currently receives U.S.-origin Highly Enriched Uranium spent nuclear fuel from foreign research reactors. Additionally, the United States has from time-to-time received spent fuel from another country to achieve nonproliferation and other Departmental missions.

PAST REPROCESSING RECORD

Question. Given that the United States has built three commercial reprocessing plants and none of them have worked, would there not be a danger that the reprocessing site would be turned into an interim storage site? (Indeed, that is exactly what happened to the reprocessing plant that GE built but never operated in Illinois.)

Answer. Recycling of commercial spent fuel in the United States was ended in 1977 by Presidential order. Commercial reprocessing had been carried out from 1966 to 1972 at West Valley, New York, at which time the plant was shut down

for modifications based on increased Nuclear Regulatory Commission (NRC) safety requirements. The combination of the Presidential Order and modification costs resulted in a decision to end the plant's operations. Two other commercial reprocessing plants (Morris, Illinois and Barnwell, South Carolina) were built but never operated with radioactive materials. Decreasing costs of low-enriched uranium have discouraged private investments in spent fuel reprocessing, particularly since the Federal Government assumed full responsibility for spent fuel management with the passage of the Nuclear Waste Policy Act in 1982 (as amended in 1987).

The Department intends to carry out the GNEP initiative in an orderly manner over several decades with the goal of having in place an immensely more efficient fuel cycle in the future. The first phase is the demonstration of technical feasibility over the next decade. If the technologies are shown to be technically feasible, then the Department will seek to promote their deployment in a manner that is commercially viable.

The Nuclear Waste Policy Act constrains the extent to which the Department can undertake interim storage and the administration's recently proposed amendment to the Nuclear Waste Policy Act did not include provisions related to interim storage of commercial spent fuel. However, we understand there are some members of Congress who are interested in pursuing interim storage as a temporary means of managing spent fuel while Yucca Mountain and recycling technology are being developed. Regardless, two conditions must be met. We must continue to ensure that Yucca Mountain is available regardless of fuel cycle scenario and regardless of the way the Department proposes to manage spent fuel, pending its disposal.

FAST REACTOR RECORD AND SAFETY

Question. What are the safety risks of sodium-cooled reactor as opposed to a thermal water cooled reactor? Please describe the incidents that have occurred related to sodium cooled reactors.

Answer. Both technologies are extremely safe. This conclusion is based on decades of operating experience with light water reactors and from large-scale demonstrations of sodium-cooled reactors in several countries. With respect to sodium-cooled reactors, these include:

—More than 30 years experience with the French 560 MWt Phenix fast reactor;
—30 years experience in the United States with the EBR–II fast reactor;
—30 years experience with Japan's 100 MWt Joyo fast reactor;
—30 years experience with Russia's 1000 MWt BN 350 reactor;
—25 years experience with Russia's 1470 MWt BN 600 reactor;
—13 years experience in the United States with the 400 MWt Fast Flux Test Facility; and
—13 years experience with France's 2900 MWt Superphenix reactor.

Phenix and EBR–II have had issues involving such things as minor sodium leaks, but there have been no nuclear-related accidents at either of them.

In addition, the passively safe design features that have been demonstrated in sodium-cooled reactors will provide an added layer of safety to Advanced Burner Reactors (ABRs). ABRs will undergo a safety review and certification process to assure safe operation.

PROLIFERATION CONCERNS

Question. Would it be possible, and if so, how hard would it be, for a country or terrorist group to extract pure plutonium from the proposed transuranic radionuclide mix (for example, in a glove box)? Could a process such as pyroprocessing be adjusted to provide more pure plutonium?

Answer. A country and a terrorist group represent two very different proliferation threats. In the case of a state actor, it has long been understood that radiation barriers provide no significant protection against chemical separation. Significant radiation barriers may provide protection against theft by sub-state actors depending upon the dedication of the sub-state group and the strength of the radiation field.

From a state, or sub-state perspective, significant shielded glove box facilities and supporting equipment would be required to separate a weapon-significant quantity of plutonium from the UREX+ product. These facilities are commonly co-located with or adjacent to hot cell capabilities since typical small laboratory-scale radiochemical operations usually involve a variety of different radiation fields and contamination hazards. A PUREX facility is designed to produce and isolate plutonium in a readily usable form; a UREX+ facility is not. Further processing of the product of a UREX+ facility would require access to shielded radiochemical facilities and technical expertise to separate the plutonium into a more readily usable form. A sub-state actor would have to secure both long term access to these facilities

and the radiochemical expertise required to perform the operations. Obviously, the state actor risks are higher in either case, since the resources of a state actor are significant in comparison with non-state adversaries. This is why IAEA safeguards are required on all non weapon state nuclear materials and facilities—including laboratory scale facilities. Reengineering a UREX+ facility could be detected by IAEA safeguards that are designed to detect such process modifications.

Pyroprocessing, by design, is not capable of making clean separations of plutonium. It is also a much more difficult technology to master than basic aqueous processes since it involves specialized high temperature molten salt and dry box hot cell facilities. As such, it is expected that proliferators will use simpler, less costly and proven aqueous technology, such as PUREX, to separate plutonium.

Question. It is vital to ensure that plutonium already separated by reprocessing is adequately secured against terrorist theft. What more should the U.S. Government be doing to ensure that nuclear stockpiles around the world are secure and accounted for and cannot fall into terrorist hands?

Answer. I share your concern that separated plutonium and other nuclear weapons usable materials currently available in civil nuclear programs around the world could fall into the hands of terrorists. For this reason, as part of NNSA's Global Threat Reduction Initiation (GTRI), NNSA has been working on an accelerated basis to ensure that highly enriched uranium and separated plutonium currently used in civilian applications around the world are subject to effective physical protection. Furthermore, GTRI is developing a path forward for recovering and dispositioning these nuclear weapons-usable materials to high security sites within the United States or within another GTRI partner country with excellent nonproliferation and nuclear security credentials. To that end, NNSA currently is negotiating with several countries that possess these vulnerable, high-risk materials to develop a plan for recovery and disposition that will reduce or eliminate the risk of theft or diversion of these so-called "gap materials" that pose a security concern to the United States and the international community.

Question. Dr. Finck of Argonne National Laboratories stated in his presentation before the Advanced Fuel Cycle Initiative's Semi-Annual Review Meeting in August of 2003, "Expect that proposed dual tier fuel cycle cannot be made intrinsically proliferation resistant." Why is UREX+ not considered proliferation-resistant? What are the issues here?

Answer. Dr. Finck's statement refers to "intrinsic" proliferation resistance. Intrinsic resistance is understood to mean the proliferation resistance of a system in the absence of any institutional, legal, or technical verification measures. The term "proliferation resistance" should not be confused with being "proliferation-proof." A system that is truly intrinsically proliferation proof would not require safeguards.

UREX+ is an aqueous separation method, and therefore it is possible to reengineer facilities and systems to separate plutonium. However, IAEA safeguards and other legal and institutional measures are significant "extrinsic" proliferation resistant features and would provide for the timely detection of tampering and re-engineering.

We do not anticipate technical characteristics alone make the UREX+ process immune to exploitation by would-be proliferators. That is why we are proposing as part of our GNEP proposal to consider future recycling only in a limited number of fuel cycle states that already possess reprocessing technology.

INTERNATIONAL CONCERNS

Question. Secretary Bodman, in a speech he gave on November 7, 2005, at the 2005 Carnegie International Nonproliferation Conference, said: "It is important to note that in addressing reprocessing—or recycling—technologies for dealing with spent fuel, we are guided by one overarching goal: to seek a global norm of no separated plutonium." and, "Regardless of whether one believes reprocessing has worked well in those nations where it is practiced, I think everyone would agree that the stores of plutonium that have built up as a consequence of conventional reprocessing technologies pose a growing proliferation risk that requires vigilant attention." Given these statements, is it correct to say that the United States will not support the reprocessing of U.S. origin and controlled spent fuel in any of the foreign reprocessing plants, other than those already in place, such as with Japan? Should the U.S. reconsider that agreement? Given these statements, can you explain why the French plutonium company AREVA has reportedly stated that it hopes to sign new reprocessing contracts covering U.S. spent fuel?

Answer. We have made no decisions regarding reprocessing of U.S.-origin spent fuel in foreign reprocessing plants. It is an issue that needs to be examined in more depth as we establish partner nations under the GNEP vision.

Question. Secretary Bodman has expressed doubt in the U.S. being able to afford to fulfill the GNEP vision by itself. Yet, for the near term the U.S. DOE strategy is to go it alone. What will be the schedule and pathway for intellectually and financially engaging international partners?

Answer. Earlier this year, the Deputy Secretary of Energy and Under Secretary of State consulted government officials in a number of countries including the United Kingdom, France, Russia, Japan and China, each of whom have large investments in the commercial fuel cycle. These discussions focused on the objectives of the Global Nuclear Energy Partnership initiative and there was general agreement on the objectives. Since then, we have continued diplomatic and technical outreach to these and other nations which would be prospective partners. The U.S. strategy is to work with international partners in developing these technologies. For example, in January the United States, France and Japan signed an agreement to guide the cooperation on the research and development of sodium cooled fast reactors, a reactor concept that is under consideration for the Advanced Burner Reactor.

NEXT GENERATION NUCLEAR PLANT (NGNP)

Question. With the new focus and funding drain due to GNEP, can the United States still afford to pursue a GEN IV plant that targets both electricity and hydrogen production?

Answer. The Department is committed to pursuing the research and development necessary to inform a decision in 2011 on deployment of the Gen IV technology. The Department has requested $23 million in fiscal year 2007 to keep the program on pace to support a fiscal year 2011 decision. Research underway includes development of coated particle fuel, qualification of high temperature materials for use in the reactor system, and development of analytical codes and methods to be used in assessing system performance. In addition, the very high temperature reactor technologies being investigated as the Next Generation Nuclear Plant could be among the concepts considered for deployment as small scale reactors under GNEP.

TIMING

Question. To date, UREX+ has been tested only on the gram scale, using technologies different than those that would be used for full-scale operation and separating a somewhat different set of materials than is now proposed—yet it is now proposed to use it for processing the 63,000 tons of commercial spent fuel slated for disposal in a geological repository, and perhaps more. Wouldn't it be wiser to wait until the technology has been further developed before proceeding to an expensive engineering-scale demonstration, and before choosing between this technology and other proposed separations technologies?

Answer. The separations technologies that the Department proposes testing have been studied for over 5 years and have been demonstrated at the laboratory scale in kilograms quantities. The Department believes that the UREX+ separations process is the best known and proven today. Only through proceeding with engineering scale demonstrations of the separations, fuels and reactor technologies will we learn the practicality and economics of deploying industrial scale facilities. Only by beginning these demonstrations now will we discover means to reduce their costs and deployment times. And only by beginning them now can we realistically expect them to be ready by the time they are needed in the future for commercial scale deployment.

Question. Why should we choose between potential reprocessing technologies in the next few years, rather than allowing whatever technologies appear to be promising to continue to develop? Are we in danger of choosing a technology because it can be made available sooner, forgoing technologies that may be more promising but may take longer to develop?

Answer. It is crucial that we start today to accelerate and demonstrate a more proliferation resistant fuel cycle—a fuel cycle for the future that can provide the benefits of nuclear energy to the world while effectively addressing civilian inventories of plutonium and reducing the quantity and toxicity of nuclear waste requiring a geologic repository.

Over the last 5 years, the Department has pursued development of various flow sheets for a more proliferation resistant separations technology. The Uranium Extraction Plus or UREX+ has been successfully demonstrated at the "laboratory scale".

REPROCESSING IN EUROPE (TRADITIONAL PUREX REPROCESSING)

Question. The concept of "recycling" conveys the notion that countries such as France and the United Kingdom re-use the plutonium as they go, but actually MOX

fuel is not made and used immediately. (Nor is the high-level liquid waste generated from reprocessing immediately vitrified; rather, it is stored in stainless steel tanks to cool.) More than 200 metric tons of commercial plutonium worldwide are separated and have not been used as MOX and the surplus is building up each year. Many reactors need costly modifications to use MOX and some reactors cannot be modified. There are about 80 metric tons of surplus plutonium at La Hague in France and similar amounts at Sellafield in the United Kingdom and about 40 metric tons in Chelyabinsk, Russia. The United Kingdom has no reactors that can use plutonium fuel and no operating MOX factory. How can the United Kingdom effort be described as a recycling program when the United Kingdom has amassed about 80 metric tons of civil weapons-usable plutonium and has no plan to use this material? (For Pu amounts reported to the IAEA—see INFCIRC 549, on IAEA web site). Why do we expect that the proposed program will be more successful in avoiding a buildup of the material separated by reprocessing?

Answer. The GNEP vision would pursue different approaches to avoid buildup of pure plutonium separated by reprocessing. Plutonium would not be separated by itself; rather, plutonium would remain mixed with other transuranic elements. The Advanced Burner Reactors would more quickly consume these transuranic elements (including plutonium) than the reactors that use plutonium-MOX. Finally, the United States would pursue a phased approach that would bring the transuranic products from UREX+ in equilibrium with the fuel needs for the demonstration of the advanced burner reactor.

Question. How much transuranic waste has been created by reprocessing in France and the United Kingdom, and how does it compare with the original spent fuel volume? Are the French planning to dispose of what they call "intermediate waste", including transuranic waste, generated from reprocessing (separate from the vitrified high level waste) in a deep geologic repository? How much of this waste will they have from reprocessing compared with the volume of spent fuel?

Answer. France and the United Kingdom do not have a geologic repository program and are developing long-term disposal plans that would address many different wastes, including vitrified waste. The structure of waste regulations in both countries differs from the United States and the volumes of waste generated would not be directly comparable.

Question. France uses plutonium fuel (MOX) in 20 out of 58 reactors, but the stockpile of civil plutonium continues to increase with no end in sight. How can this growing stockpile be presented as "recycling"? MOX fuel produces less than 10 percent of France's nuclear electricity, but an official French report indicates that it imposes about $1 billion per year in added electricity costs. Why does Electricite de France (EDF), the state-owned utility forced to use MOX fuel, place a negative value on plutonium they must take from the reprocessing company (Cogema)? Isn't the French reprocessing company almost wholly owned by the government (about 85 percent as of 2004)?

Answer. There are significant differences between the French approach to recycling and the approach being explored by the United States. The French MOX-recycling program is based on plutonium-only separation using PUREX and is aimed at obtaining modest energy recovery from that plutonium. The French program does not aim to maximize use of a geologic repository nor address repository costs in its current economics.

GNEP has a broad range of objectives, including decreasing inventories of weapons-usable material (whether in used fuel or already separated), avoiding separation of pure plutonium, incorporation of newest safeguard design techniques, and making more efficient use of the U.S. geologic repository at Yucca Mountain. While the French program focuses on plutonium, the GNEP addresses proposed technologies relating to plutonium, americium, curium, and neptunium, thereby increasing waste management benefits. Recycle and consumption of plutonium, americium and neptunium decrease the geologic heat load and long-term potential doses. Recovery of uranium, at the purity level equal to low-level waste, reduces the volume of the waste. If the GNEP technologies are successful, the residual waste would be put into a form that is more resistant to long-term leaching than once-through used fuel, further reducing the technical requirements for geologic repository design.

Question. The United Kingdom's THORP reprocessing plant, which reprocesses foreign light water reactor fuel, had a major accident which was discovered last year after several months (a leak of nuclear material onto the floor of one cell, due to a broken process pipe). The accident has resulted in the facility being shut down indefinitely, with the possibility that it might not start back up. The operators of this plant have asked the United Kingdom government to permanently close the plant, which has never been profitable. What is the risk of similar accidents and safety record in the United States if we pursue reprocessing?

Answer. The overall safety record of fuel cycle operations in the United States is excellent, and is the model that should be followed in evaluation of fuel cycle issues. The safety of U.S. operations routinely exceeds established industrial standards of the countries in which they are deployed. The lessons learned from the leak at THORP, as well as all other off-normal events, have been closely studied and are well understood. The facilities under the GNEP initiative would be subject to rigorous safety analyses and regulatory oversight.

ENVIRONMENTAL/NEPA

Question. What NEPA related requirements will have to be met in the course of developing GNEP in the next year/years to come?

Answer. On March 22, 2006, the Department issued an Advance Notice of Intent (NOI) for the GNEP Technology Demonstration Program. Over the next 2 years, the Department plans to develop an Environmental Impact Statement to assess the potential environmental impacts associated with the GNEP Technology Demonstration Program. At an appropriate point in the future, DOE will prepare a Programmatic Environmental Impact Statement to inform the ultimate decision of whether to proceed with potential future actions to encourage the commercial-scale deployment of proliferation-resistant GNEP Technology Demonstration Program technologies.

PUBLIC DISCLOSURE

Question. What was the nature of the briefings on GNEP given to and responses from the countries which have been briefed on this program? What companies were briefed as part of those briefings? And which U.S. companies have been briefed?

Answer. Briefings by the U.S. Government on GNEP have proceeded with a variety of countries. Prior to the February 6, 2006 public announcement of GNEP, the administration consulted with officials from the United Kingdom, France, Russia, Japan, China and the International Atomic Energy Agency (IAEA), and the GNEP vision was well received in each case. These were government-to-government meetings. Part of the consultation with the officials from France included a meeting with representatives from Areva. Further technical discussions on areas for technology partnership are ongoing.

Shortly after the February 6, 2006 announcement of GNEP, a cable was sent to all diplomatic posts providing information on GNEP. Government delegations from Canada, the Republic of South Korea, and Indonesia were briefed at their request. In addition, many science counselors from embassies that expressed interest in learning more about GNEP from Europe, Asia, Latin America and Africa were briefed in Washington. In March 2006, the IAEA Board of Governors was briefed, including representatives from nearly 40 countries. The response to the briefings reflected interest.

Since the announcement of GNEP, the Department has provided briefings on GNEP to the U.S. nuclear industry through the Nuclear Energy Institute, and the National Association of Regulatory Utility Commissioners. The Department has held discussions with a number of U.S. utilities and nuclear suppliers that might have an interest in GNEP. The GNEP vision also has been discussed with representatives of foreign government-owned nuclear companies or their American affiliates at conferences or meetings on related matters (e.g., Generation IV).

Question. Former Secretary of Energy Spencer Abraham has been named Chairman of Areva, Inc. in the United States. As the French company Areva strongly supports the development of reprocessing and favors reprocessing U.S. spent fuel in France, do any conflict of interest laws apply, and has Secretary Abraham lobbied the Department of Energy on this issue?

Answer. Former Secretary Spencer Abraham terminated his Federal service on January 31, 2005. He continues to be subject to the post-employment restrictions of 18 U.S.C. 207(a). That section prohibits, in part, a former employee from knowingly making, with the intent to influence, any communication to or appearance before any employee of any department, agency, or court of the United States on behalf of any other person in connection with a particular matter involving a specific party, in which the former employee participated personally and substantially as an employee of the government. That section also prohibits, a former employee from knowingly making such communications or appearances when the former employee knows or reasonably should know that the particular matter involving a specific party was actually pending under his official responsibility within a period of 1 year before the termination of his Federal service. Former Secretary Abraham is no longer subject to a number of other post-employment restrictions that ended 1 year after his Federal service terminated.

To the best of my knowledge, former Secretary Abraham has not lobbied the Department on behalf of Areva, Inc.

SUBCOMMITTEE RECESS

Senator ALLARD [continuing]. So we can move forward with our deliberations.

And, without any more questions, I now declare the subcommittee in recess.

[Whereupon, at 4:05 p.m., Tuesday, March 2, 2006, the subcommittee was recessed, to reconvene subject to the call of the Chair.]