S. HRG. 114–800

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2017

HEARINGS

BEFORE A

SUBCOMMITTEE OF THE

COMMITTEE ON APPROPRIATIONS

UNITED STATES SENATE

ONE HUNDRED FOURTEENTH CONGRESS

SECOND SESSION

ON

H.R. 5055/S. 2804

AN ACT MAKING APPROPRIATIONS FOR ENERGY AND WATER DEVELOPMENT FOR THE FISCAL YEAR ENDING SEPTEMBER 30, 2017, AND FOR OTHER PURPOSES

Department of Defense—Civil
Department of Energy
Department of the Interior

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BACK MATTER

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2017

WEDNESDAY, FEBRUARY 24, 2016

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

The subcommittee met at 2:34 p.m. in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Murkowski, and Feinstein.

NUCLEAR REGULATORY COMMISSION

STATEMENT OF HON. STEPHEN G. BURNS, CHAIRMAN

ACCOMPANIED BY:
HON. KRISTINE SVINICKI, COMMISSIONER
HON. WILLIAM OSTENDORFF, COMMISSIONER
HON. JEFF BARAN, COMMISSIONER

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. The Subcommittee on Energy and Water Development please come to order.

Today's hearing will review the President's fiscal year 2017 budget request for the Nuclear Regulatory Commission.

This is our first budget hearing this year. We expect to have three more budget hearings in the coming weeks. Senator Feinstein and I will each have an opening statement, and let me—it gives me an opportunity to say again what a delight it is to serve with her, to serve with somebody who has such good, strong knowledge of the subject, but also who, as a former mayor of a big city, knows how to make a decision. So it's nice to work with her in an effective and bipartisan way. And we find areas where we can put our heads together and come to an agreement and get a result, which makes service in the Senate much more satisfying to me. So I thank her for the way she does things.

I will then recognize each Senator for up to 5 minutes after we have our opening statement for an opening statement, alternating between the majority and minority in the order in which they arrive, and will then turn to Chairman Burns to present testimony on behalf of the Commission. I will then recognize the Senators for 5 minutes of questions each, alternating from side to side.

Our witnesses today include Stephen Burns, chairman of the Nuclear Regulatory Commission.

Welcome, Mr. Chairman.

Commissioner Kristine Svinicki, welcome. Good to see you again.

Commissioner William Ostendorff. This will be the last hearing for Commissioner Ostendorff because he has announced he will be leaving the Commission at the end of his term in June, and returning to teach at the U.S. Naval Academy. He has been a strong and effective member of the Commission, and we thank him for that and wish him well in his new role.

Commissioner Jeff Baran. Welcome to you, Jeff.

As I said, we are here to review the proposed 2017 budget request for the Commission, which is the independent Federal agency responsible for regulating the safety of our Nation's commercial nuclear power plants and other nuclear materials.

The budget request is $970.2 million. That's a decrease of $19.8 million from fiscal year 2016. The decrease is, in my opinion, a positive step toward making the Commission's budget reflect its actual workload.

I also thank the chairman and the Commission for working together to identify more ways to reduce spending and reduce the NRC (Nuclear Regulatory Commission) funding needs for the coming year. And long as I talk about it, I thank you for working together because there was a time on the Commission when that wasn't going on, and for the last few years, it's been obvious to me that there is a collegial atmosphere there, and that obviously makes for a better functioning entity.

We want to work closely with the Commission to make sure our bill reflects the savings, making the best use of taxpayer dollars. However, we want to make sure we continue to invest in nuclear power, which provides more than 60 percent of our country's carbon-free electricity.

At a time when the President and many in the country see climate change as a major issue, it's difficult for me to see why we should not make nuclear power a primary solution, or one of the primary solutions, to dealing with that problem because of our expertise at it and because of the amount of carbon-free electricity it produces.

Safely extending our existing reactors, licensing new reactors, including small reactors, solving the nuclear waste stalemate, are all important to the future of the industry—of nuclear energy. And I will focus my question on four main areas: solving the nuclear waste stalemate is something Senator Feinstein and I are dedicated to; safely extending licenses for existing reactors, which seems to me to be the logical way, at least for the next 20 years or so, to produce the largest amount of carbon-free electricity in the country; licensing new reactors; and making sure that the Commission is operating efficiently. Let me take those one by one.

To be sure that we have a strong future for nuclear energy, we must solve the 25-year-old stalemate about what to do about waste from the reactors. Last year, Senator Feinstein and Senators Murkowski, Cantwell, and I reintroduced bipartisan legislation to create temporary and permanent facilities to store and dispose of our nuclear fuel. Our bill was consistent with the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future.

Senator Feinstein and I, with the support of leaders of the authorizing committee, plan to include in the Energy and Water bill we're drafting this year, a pilot program for nuclear waste storage and language that allows the Secretary of Energy to contract with private storage facilities, as we have in the past. These new storage facilities and repositories would not take the place of Yucca Mountain in my opinion—we have more than enough waste to fill Yucca Mountain to its legal capacity—but, rather, would complement it.

I strongly believe that Yucca Mountain can and should be part of the solution. Federal law designates Yucca Mountain as the Nation's repository for nuclear fuel. The Commission's own scientists have told us that we can safely store nuclear waste there for up to 1 million years. But regardless of where we build permanent repositories, we still need facilities where we can consolidate all of the used fuel that is currently located at more than 75 sites around the country. The Blue Ribbon Commission concluded, "That it would be prudent to pursue the development of consolidated storage capability without further delay," and Senator Feinstein and I agree with that recommendation.

Over the last 4 years, we have heard from communities and States who are interested in hosting a consolidated storage site. I support moving forward with a consolidated storage on as many tracks as we can at once, whether it's at a private facility or one built under our own pilot program. And it's important to make sure the Commission is ready to act expeditiously.

I understand that at least one private company is planning to submit an application to the Commission later this year for a license to build and operate a consolidated storage facility, and there may be others. I want to make sure the Commission has all the resources it needs in fiscal year 2017 to complete a review of such applications.

And I also want to be clear that, in my opinion, the Commission should continue licensing activities for Yucca Mountain. The Nuclear Waste Fund, which is money that utilities have collected from customers on their monthly bills from 1983 until 2013, and paid to the Government to dispose of their used nuclear fuel, plus accrued interest, will have a balance of about $37.5 billion at the end of the year, and there are still several steps to go in the licensing process of Yucca Mountain.

The Government has been prevented from collecting fees since 2013, when the Court of Appeals for the D.C. Circuit said the Federal Government should comply with the Nuclear Waste Policy Act as it's currently written—that is, open Yucca Mountain—or until Congress enacts an alternative nuclear waste management plan. Yet, for the sixth year, the Commission has not requested any funding to continue licensing activities for Yucca even though the Commission will run out of money later this year for that purpose, and there are still several more steps that need to be taken.

Number two, safely extending licenses for existing reactors. Instead of building more windmills, which only produce 14 percent of our carbon-free electricity despite 25 years of multibillion dollar subsidies, or solar farms, which produce 1 percent of our carbon-free electricity, the best way to make sure the United States has a reliable source of cheap, efficient, carbon-free electricity is to ex-

tend the licenses of the nuclear reactors that are today already operating and producing 60 percent of our carbon-free electricity. Most of our 100 reactors have already extended their operating licenses from 40 to 60 years. Some utilities are planning to begin the process to extend these licenses from 60 to 80 years.

The Commission told the subcommittee in last year's hearing that it had already developed the framework to safely extend licenses beyond 60 years, and I want to make sure the Commission has the resources it needs to take any final—any additional steps prior to receiving those applications.

Number three, licensing new reactors. In addition to the reactors we already have, the Commission needs to be ready to review applications for new reactors, especially including small modular reactors. I understand that NuScale may file an application for design certification of a small reactor with the Commission later this year. Last week, NuScale received a permit from the Department of Energy, which will allow the company to build a small modular reactor module within 10 years on the property of the Idaho National Laboratory and use the site for 99 years for its operation.

This new reactor design has been supported by the Department of Energy's small modular reactor program, which this subcommittee has funded since 2012. The subcommittee has also provided the NRC with funding to prepare to receive applications for small modular reactors. I want to make sure the Commission is ready to review this new technology once it receives its application. I also understand the Commission has requested $5 million to look at advanced reactor designs, and I would like to understand more about your plans for those funds.

And, finally, making sure that the Commission is running efficiently. One of the challenges is to make sure the agency is running efficiently and focusing on the right goals. That's part of management.

In the 2000s, the Commission began planning to receive a large number of applications for new reactor licenses, and the Congress increased the Commission's funding from $470 million in fiscal year 2000 to a high of $1.043 billion in 2014, a doubling of funding. But most of these expected licenses were never actually submitted, which has left the Commission's workforce and budget out of balance with its actual workload.

In June 2014, the Commission began an effort, known as Project Aim, to address this imbalance by looking at the work that would be needed over the next several years and then aligning its workforce and budget with that forecast. As a result of this effort, the Commission's budget has decreased. In fact, this year's budget request is about $74 million less than what the Commission received in 2014.

Last year, we worked with the Commission to cut its budget request by about $30 million. I am pleased that this year's budget request continues in that direction. I understand the Commission's staff has identified an additional $32 million in savings that could be applied to this year's budget request. I want to make sure the bill that Senator Feinstein and I and the committee members will be drafting reflects these additional savings so taxpayer money is wisely and effectively spent.

I look forward to working with the Commission as we begin putting together our Energy and Water Appropriations bills. My hope would be that our bill would be one of the first on the floor, and that Senator McConnell and Senator Reid can put it up there and we can begin an appropriations process of the kind the Senate should have, and that we haven't had for a while.

And I will now recognize my distinguished Ranking Member, Senator Feinstein, for an opening statement.

[The statement follows:]

PREPARED STATEMENT OF SENATOR LAMAR ALEXANDER

We're here today to review the President's fiscal year 2017 budget request for the Nuclear Regulatory Commission, the independent Federal agency responsible for regulating the safety of our Nation's commercial nuclear power plants and other nuclear materials.

The budget request for the Nuclear Regulatory Commission is $970.2 million dollars. This is a decrease of $19.8 million dollars from fiscal year 2016. This decrease from last year's appropriations bill is a positive step toward making the Commission's budget reflect its actual workload.

I also appreciate the Commission's efforts to identify more ways to reduce spending and reduce the NRC's funding needs for the coming year. We want to work closely with the Commission to make sure the Energy and Water Appropriations bill we are drafting reflects those savings, making the best use of taxpayer dollars.

However, we also want to make sure we continue to invest in nuclear power, which provides more than 60 percent of our country's carbon-free electricity. Safely extending licenses for our existing reactors, licensing new reactors, including small modular reactors, and solving the nuclear waste stalemate are all important to the future of nuclear energy.

Today, I will focus my questions on four main areas:

1) Licensing facilities for used nuclear fuel and solving the nuclear waste stalemate;
2) Safely extending licenses for existing reactors;
3) Licensing new reactors; and
4) Making sure the Nuclear Regulatory Commission is operating efficiently.

LICENSING FACILITIES FOR USED NUCLEAR FUEL

To ensure that nuclear power has a strong future in this country, we must solve the 25-year-old stalemate about what to do with used fuel from our nuclear reactors.

Last year, Senators Feinstein, Murkowski, Cantwell, and I reintroduced bipartisan legislation, to create temporary and permanent facilities to store and dispose of our used nuclear fuel, consistent with the recommendations of the Blue Ribbon Commission on America's Nuclear Future.

Senator Feinstein and I, with the support of the leaders of the authorizing committee, plan to include in the Energy and Water bill we're drafting this year, a pilot program for nuclear waste storage and language that allows the Secretary of Energy to contract with private storage facilities, as we have in the past. These new storage facilities and repositories would not take the place of Yucca Mountain—we have more than enough waste to fill Yucca Mountain to its legal capacity—but rather would complement it.

I strongly believe that Yucca Mountain can and should be part of the solution. Federal law designates Yucca Mountain as the Nation's repository for used nuclear fuel, and the Commission's own scientists have told us that we can safely store nuclear waste there for up to 1 million years.

But regardless of where we build permanent repositories, we still need facilities where we can consolidate all of the used fuel that is currently located at more than 75 sites around the country. The Blue Ribbon Commission concluded that "it would be prudent to pursue the development of consolidated storage capability without further delay," and Sen. Feinstein and I agree with that recommendation.

Over the last 4 years, we have heard from communities and States who are interested in hosting a consolidated storage site. I support moving forward with consolidated storage on as many tracks as we can, whether it's at a private facility or one built under our pilot program, and it is important to make sure that the Commission is ready to act expeditiously.

I understand that at least one private company is planning to submit an application to the Commission later this year for a license to build and operate a consoli-

dated storage facility, and there may be others. I want to make sure that the Commission has all the resources it needs in fiscal year 2017 to complete a review of these applications. I also want to be clear that the Commission should continue licensing activities for Yucca Mountain.

The Nuclear Waste Fund, which is money that utilities have collected from customers on their monthly bills from 1983 until 2013 and paid to the government to dispose of their used nuclear fuel plus accrued interest, will have a balance of about $37.5 billion at the end of the year, and there are still several steps to go in the licensing process for Yucca Mountain.

The government has been prevented from collecting fees since 2013, when the Court of Appeals for the D.C. Circuit Court said the Federal government should comply with the Nuclear Waste Policy Act as it is currently written—i.e. open Yucca Mountain—or until Congress enacts an alternative nuclear waste management plan.

Yet for the sixth year, the Commission has not requested any funding to continue licensing activities for Yucca Mountain, even though the Commission will run out of money later this year for that purpose and there are still several more steps that need to be taken.

SAFELY EXTENDING LICENSES FOR EXISTING REACTORS

Instead of building more windmills, which only produce 14 percent of our carbon-free electricity, or solar farms, which only produce 1 percent of our carbon-free electricity, the best way to make sure the United States has a reliable source of cheap, efficient, carbon-free electricity is to extend the licenses of the nuclear reactors that are already operating.

Most of our 100 reactors have already extended their operating licenses from 40 to 60 years, and some utilities are planning to begin the process to extend these licenses from 60 to 80 years.

The Commission told the Subcommittee in last year's hearing that it had already developed the framework to safely extend licenses beyond 60 years, and I want to make sure that the Commission has the resources it needs to take any additional steps it needs prior to receiving those applications.

LICENSING NEW REACTORS

In addition to the reactors we already have, the Commission also needs to be ready to review applications for new reactors, including small modular reactors.

I understand that NuScale may file an application for design certification of a small modular reactor with the Commission later this year. Last week, NuScale received a permit from the Department of Energy, which will allow the company to build a small modular reactor module within 10 years on the property of Idaho National Laboratory and to use the site for 99 years for its operation.

This new reactor design has been supported by the Department of Energy's small modular reactor program, which this subcommittee has funded since 2012. The subcommittee has also provided the NRC with funding to prepare to receive applications for small modular reactors. I want to make sure the Commission is ready to review this new technology once it receives an application.

I also understand that the Commission has requested $5 million to look at advanced reactor designs, and I'd like to understand more about the Commission's plans for these funds.

MAKING SURE THE NUCLEAR REGULATORY COMMISSION IS RUNNING EFFICIENTLY

One of the challenges for the Nuclear Regulatory Commission is to make sure the agency is running effectively and focusing on the right goals.

In the early 2000s, the Commission began planning to receive a large number of applications for new reactor licenses, and Congress increased the Commission's funding from $470 million in fiscal year 2000 to a high of $1.043 billion in fiscal year 2014. But most of these expected licenses were never actually submitted, which has left the Commission's workforce and budget out of balance with its actual workload.

In June 2014, the Commission began an effort, known as Project Aim, to address this imbalance by looking at the work that would be needed over the next several years and then aligning its workforce and budget with that forecast. As a result of the first step of this effort, the Commission's budget has decreased. In fact, this year's budget request is about $74 million dollars less than what the Commission received in 2014.

Last year, we worked with the Commission to cut its budget request by about $30 million dollars, and I'm pleased this year's budget request continues in the right direction. I understand that the Commission's staff has identified an additional $32

million in savings that could be applied to this year's budget request. I want to make sure the bill Sen. Feinstein and I are drafting this year reflects those additional savings so taxpayer money is used effectively.

I look forward to working with the Commission as we begin putting together our Energy and Water Appropriations bill for fiscal year 2017, and also with my Ranking Member, Senator Feinstein, who I will now recognize for an opening statement.

Senator ALEXANDER. Senator Feinstein.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Well, thanks very much, Mr. Chairman. I think you have made a very erudite and important statement, and I tried to listen to it carefully. I have come to have great respect for your knowledge, your acumen, and your ability to sit down and work out a solution. So, unfortunately, we have tried with the House, and not been as successful as we might have been, but, you know, hope springs eternal——

Senator ALEXANDER. Right.

Senator FEINSTEIN [continuing]. And I would really hope that this year we could make some progress with respect to a nuclear waste policy. And I understand your priorities.

And I guess what I ask you to do, and others to do, is understand that I was a young child when the bombs were leveled at Hiroshima and Nagasaki. And I was old enough to read, so I read every newspaper I could get and saw pictures that were etched in my consciousness for the rest of my life. So I became very much aware, and I tried to follow Chernobyl and people going back to Chernobyl even after all these decades and finding how hot the radiation is. I remember watching a television program on it when they went to where the uniforms were stored in a building from the first people onsite, Russian soldiers and others, that first went into Chernobyl. And I don't know how many of them lived, but the uniforms all these decades later—they had Geiger counters, and the Geiger counters just went ballistic. So they're all still very, very hot. And I think we have to really at times be brought back to the reality.

I think a lot of my concern is because I'm on the Pacific, I'm a westerner, and I happen to believe that the Pacific Ocean is in fact a ring of fire for big earthquakes, and, therefore, seeing that waste is properly disposed of so that it can't be done or the spent fuel pools won't split, as they have in Fukushima, and the other problems that Fukushima has had have been solved.

Since our last meeting—and I want to very much compliment Southern California Edison because they have—are in the process of decommissioning with the NRC their two big reactors. And I think as the Commission knows, and we know, they have maybe 4,000 elements in spent fuel pools that are just a few yards from the beach, and 6 million people live on the other side. I know what the problem was in the faulty steam generator, and I think they did the right thing by decommissioning those reactors, but there is still a lot to worry about.

We have another utility company that is located, again, on the ocean. I've been there. And they have taken a lot of precautions, but there are earthquake fractures and faults that run not too far away. So all of that is an increasing concern for me. But the need for a nuclear waste policy, which you have so well described and

which we together, as well as with the authorizers, have worked on for, what, 4 years now?

Senator ALEXANDER. Yes.

Senator FEINSTEIN. And we've gone through three chairs of the Energy Committee, and it's still sitting there, and it's sitting there because of a conflict with Yucca. And I'm really concerned about that because we cannot be stopped by Yucca from doing good public policy around nuclear. You pointed out that it's 60 percent of our clean power, and it's very cheap. Well, if we're moribund, if we're in stasis, and we can't do anything to see that we can fix the problems, it's a very difficult time that we're going to have.

So I couldn't ask for anyone more reasonable, more informed. And I really hope that we can spend some time and try to see if we can't get these problems resolved. We've tried before, but we have to succeed. So that's the need for our nuclear waste policy, and as you pointed out, ensuring the safety of nuclear plants, particularly after Fukushima, and applying the regulations to aging plants.

It's my understanding that spent nuclear fuel is piling up at reactor sites around the country, 74,000 metric tons of it to date. Approximately 130 million people live within 50 miles of a storage site for commercial or government-owned spent nuclear fuel and other high-level waste. I mentioned in California alone, they shut down San Onofre Nuclear Generating Station, stores the 4,000 highly radioactive spent fuel assemblies just yards from the ocean. Reactors are being given license extensions, even though we have no long-term plan to store the waste they produce. This is very hard for me.

So I think NRC needs to play a key role in helping us solve that problem, notably by being ready to review license applications for spent fuel storage sites as we envision in our Appropriation bill. NRC will also need to ensure that storage and transportation equipment and the procedures for handling spent fuel are fully protective of human health and the environment.

So what Senator Alexander and I have done, and Senators Murkowski and Cantwell, we hope we can push to get that Nuclear Waste Policy Act into law. But we're nearing the fifth anniversary of the Fukushima disaster, which showed us how nature can quickly overwhelm even the best designed safety systems.

Diablo Canyon, as I mentioned, sits on two major faults, and it could be subject to some of the same risks as Fukushima. Some post-Fukushima analysis argued that the Japanese regulatory structure was too close to the nuclear industry it was regulating, which contributed to the disaster, and so we can't allow that to happen here. The NRC must be independent, tough-nosed, and puts reactor operations above all.

Finally, the fleet of nuclear reactors in our country is aging. Of the 99 operating reactors, as you pointed out, Mr. Chairman, 81 have been granted license extensions to operate for 60 years; another 11 have applications pending before the Commission. In addition, NRC has implemented the subsequent license renewal program to license reactors out to 80 years, and expects its first application in 2019.

To me, this gives me pause, and I think it should give us all pause. As these plants age, and the stresses of operations and exposure to radioactivity take their toll, I hope that the NRC takes a rigorous, evidence-based approach to ensuring that all of the systems that comprise a nuclear power plant function are safe and secure. The consequences of failure, however small the chances, are really too grave to ignore.

I understand the NRC has undertaken an effort called Project Aim—A–I–M—to make sure its budget and workforce are in line with the agency's future needs. The goal of the project, as I understand it, is to reduce funding and staffing levels by 10 percent by 2020. With its 2017 budget request, the NRC will have reduced staff by 280 employees, and funding by $74 million from 2014 levels. That's a very big decline. The nuclear industry has applauded this effort and called for deeper cuts.

Now, I'm all for increasing Government efficiency, but I really grow concerned when an industry champions less oversight of its operations. So let me repeat: the American people need NRC to be a strong, independent, and capable regulator, and the nuclear industry should be held accountable to it for the safety of all reactors, both operating and retired.

So I think we should sit down and talk about this. You know, I still—I went to San Onofre. I looked at the steam generator that was a Mitsubishi product. It was not like-for-like, but believed to have alloys that were much improved. I was told about where the punctures were, and at that time, it was limited to one of the pair. Well, the other one began then to develop punctures. I'm not an expert, so I don't know. I know whether it's vibration or exactly what it was. And apparently the company felt it strongly enough to shut them both down and decommission them. Right in my State, that's a very major occurrence because this is a huge company, which I think they serve 16, 19 million people. It's enormous. And so they have had to find substitute power, which they have been able to do I think in a very solid way. But I am really worried about all this waste.

And I'll say one other thing. As we have kind of looked into the WIPP (Waste Isolation Pilot Plant) facility in New Mexico, and we found that this most revered lab, Los Alamos, contracted with a contractor that put the wrong kitty litter in these drums, so they began to explode, and the facility is now out of—not out of business, but out of business temporarily for I think—how many years is it?

Senator ALEXANDER. It's been 2 years so far.

Senator FEINSTEIN. Two years so far, and I gather another 2 at least.

Senator ALEXANDER. Well, it should be back this year.

Senator FEINSTEIN. It should be back this year. Well, that's good news. I did not know that. But to think that the most capable people in a nuclear-related lab contracted out and made a mistake. See, I can't forget that, and it does condition my thinking.

Accidents do happen, and I think maintaining a robust NRC is our stop against incidents. So I'll be very—I don't want to see the NRC, in any way, shape, or form, be able to come in, in a year and say, "Well, you cut us back, so we couldn't do this or that or the

other thing." And I think we need to take a very sober appraisal of, A, what we believe they should be doing, the priority items, and see that they are well and professionally staffed to do that.

So I hope we can make progress this year on our nuclear waste policy. I know that I am grateful to you because you have put the pilot in the bill every year, and I have kind of come down off my high horse on the advanced modular nuclear reactors a little bit.

Senator ALEXANDER. You did exactly that. Yes.

Senator FEINSTEIN. But the high horse is still there about more when you don't have a place for the waste.

Senator ALEXANDER. Yes.

Senator FEINSTEIN. So it's a great treat to work with you, Mr. Chairman. Thank you very much.

Senator ALEXANDER. Thank you, Senator Feinstein. We certainly don't want you back on your high horse. That would not be good, so we'll redouble our efforts.

Well, that's a very compelling statement, and I thank you for it. And I think—let me suggest that we each take about 10 minutes with our questions. We're the only two here—and if the other Senators come, why, we'll let them—we'll cut it back to five when they get here. But that will give us a chance to have more of a conversation.

Let me start—oh, that's right. I forgot. The next thing is for Chairman Burns to give his testimony, and then we will ask our questions, and maybe by that time there will be other Senators.

So, Mr. Chairman, welcome.

SUMMARY STATEMENT OF HON. STEPHEN G. BURNS

Mr. BURNS. Thank you, Chairman Alexander and Ranking Member Feinstein. We appreciate the opportunity to appear before you to discuss our budget request for fiscal year 2017.

As you know, and you said, the NRC is an independent agency established to license and regulate and oversee the civilian use of radioactive material and facilities in the United States. And the resources we're asking for in fiscal year 2017 will allow us to continue to uphold our important safety and security mission.

The proposed budget is $970.2 million and 3,462 full-time equivalent staff, which represents a decrease of $20 million and about 90 full-time equivalents from the fiscal year 2016 enacted budget. In addition, there is a provision for about $12.1 million for the budget for our inspector general.

For further context, our request is $74 million and 280 FTEs less than our fiscal year 2014 enacted budget. And the request reflects our continued focus on our mission, our important safety and security mission, while it also achieves some resource savings and improves our efficiency. As we continue to work through the Project Aim initiative, we anticipate additional savings.

We are required to recover, by law, approximately 90 percent of our budget through fees, and, accordingly, about $861.2 million of the fiscal year 2017 budget request would be recovered from NRC licensees, resulting in a net appropriation of $121.1 million.

Let me highlight some of the work we will achieve. We will continue our licensing and oversight activities for 100 operating nuclear power reactors, and 31 research and test reactors. The NRC

expects to continue reviewing three new reactor combined license applications, and, additionally, the NRC will continue the inspections of four nuclear—new nuclear units under construction in Georgia and South Carolina, and will also continue our vendor inspection program.

We expect to review one small modular reactor design certification, that's the NuScale design that was mentioned earlier, and we will review three applications for medical isotope facilities.

The budget request provides funding for licensing reviews and oversight activities at reactors undergoing decommissioning, as well as continued oversight over waste and spent fuel storage facilities. We expect to review one application for a spent fuel storage facility.

We'll continue to license and oversee the safe and secure use of radioactive materials. In fiscal year 2017, the NRC will complete about 2,000 materials licensing actions and about 900 routine health and safety inspections in this area.

Of note, our budget request includes $5 million in non-fee billable activities to develop regulatory infrastructure to effectively review advanced reactor applications.

As we continue to work through the Project Aim initiative, we are confident the agency is on the right track. We have already identified savings through a comprehensive evaluation that involves staff and stakeholder input. Still, we remain mindful of the importance of our highly skilled technical staff in carrying out our mission, and while our size may change to reflect efficiency gains, the need for the service we provide to the American people remains unchanged.

I want to highlight one other area where we are focusing on improvement. We're cognizant of the committee's concerns regarding early Commission involvement in rulemaking, and we have approved a new approach to do so, to enhance the involvement of the Commission, and we'll provide requested information to the committee next month, as provided in the committee's report on the fiscal year 2016 appropriation.

On behalf of the Commission, I thank you for the opportunity to appear before you today, and I know you share our dedication to the vital mission of the NRC. And we'd be pleased to answer your questions.

Thank you.

[The statement follows:]

PREPARED STATEMENT OF STEPHEN G. BURNS

Good afternoon, Chairman Alexander, Ranking Member Feinstein, and distinguished Members of the Subcommittee. My colleagues and I appreciate the opportunity to appear before you today to discuss the U. S. Nuclear Regulatory Commission's (NRC) fiscal year 2017 budget request.

As you know, the NRC is an independent agency established to license and regulate the civilian use of radioactive materials in the United States to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment. The resources we are requesting for fiscal year 2017 will allow the NRC to continue to uphold our important safety and security mission.

We'd like to underscore that this budget request reflects a substantial reduction from the 2016 enacted budget. Project Aim is delivering on the promise to achieve efficiencies in both corporate and programmatic areas. The NRC has taken a hard look at the proposed budget, and is proposing reductions in both full-time equivalents (FTE) and contract support dollars that represent real savings. As we continue

our work through the Project Aim initiative, we anticipate additional savings and efficiencies to come.

To put this in context, the fiscal year 2017 budget request reflects a decrease of $73.7 million and 279.7 full-time equivalent employees from the fiscal year 2014 enacted budget. We believe this fiscal year 2017 budget request reflects our continuing focus on our important mission while achieving resource savings and improving the agency's efficiency and effectiveness.

In fiscal year 2017, the NRC will continue licensing and oversight activities for 100 operating commercial nuclear power reactors, including the Watts Bar Unit 2 nuclear power station slated to begin commercial operation later in calendar year 2016, and 31 research and test reactors. The resources we have requested for fiscal year 2017 also support ongoing work associated with implementing lessons learned from the Fukushima Dai-ichi Nuclear Power Plant accident in Japan. While we expect the bulk of the most safety significant enhancements to be completed in calendar year 2016 and to bring to closure our work on most of the longer-term "Tier 2 and 3" issues, resources requested for fiscal year 2017 support the continued implementation of the "Tier 1" enhancements, including seismic and flooding hazard reevaluations, spent fuel pool instrumentation and mitigation of beyond design basis events.

During fiscal year 2017, the NRC expects to continue reviewing three new reactor combined license applications. Additionally, the NRC will continue to conduct inspections of four new reactor units under construction—Vogtle Electric Generating Plant, Units 3 and 4, and Virgil C. Summer Nuclear Station, Units 2 and 3—and will continue to carry out its vendor inspection program for both new and operating reactors. The NRC also expects to receive and begin review of one small modular reactor design certification application from NuScale.

Further, the NRC plans to review three applications for medical isotope production facilities, including reviewing an operating license for one facility and conducting environmental and safety reviews of construction permits at two others.

The fiscal year 2017 budget request includes $5 million in non-fee billable activities related to developing the regulatory infrastructure for advanced nuclear reactor technologies. This funding would prepare the NRC to undertake effective and efficient licensing reviews of advanced reactor technologies consistent with the maturity and development pace of the technologies. The intended activities to be initiated in fiscal year 2017 would fall into three categories: licensing infrastructure, technical preparation, and outreach.

Additionally, the fiscal year 2017 budget request provides funding for licensing reviews and oversight activities at power reactors undergoing decommissioning, including Kewaunee Power Station, San Onofre Nuclear Generating Station Units 2 and 3, Crystal River 3 Nuclear Power Plant and Vermont Yankee Nuclear Power Plant.

The fiscal year 2017 budget request also ensures the NRC can continue to license and oversee the safe and secure use of radioactive materials used for medical, academic, industrial and research purposes. The NRC and Agreement states oversee approximately 21,000 specific materials licensees. In fiscal year 2017, the NRC will complete approximately 2,000 materials licensing actions and approximately 900 routine health and safety inspections, as well as reactive and follow-up inspections.

In fiscal year 2017, the NRC will continue its oversight over nuclear waste and spent fuel storage facilities, certify storage and transportation containers and respond to events involving our licensees. The NRC expects to review one application for an interim consolidated storage facility.

In fiscal year 2017, the NRC's research program will continue to support the NRC's regulatory activities by evaluating and resolving safety issues for NRC-regulated nuclear power plants, other nuclear facilities and materials users that the agency regulates. The NRC will further enhance its regulatory programs through coordination and cooperation with other Federal agencies, States, Tribes, and international organizations and foreign governments. The NRC will continue to support international conventions on safety and treaty compliance, and support a wide range of activities to help foreign regulatory counterparts develop or enhance their programs and their controls over radioactive sources.

THE CHANGING REGULATORY ENVIRONMENT

Before I get into the specifics of the NRC's fiscal year 2017 budget request, I would like to talk about our Project Aim effort to find efficiencies, use resources wisely, and streamline processes and regulatory decisionmaking while continuing to meet our critically important safety and security mission.

Since 2001, the agency grew significantly to enhance its security and incident response regulatory structure, and to prepare for the projected growth in nuclear power in the United States. That forecast in growth has been adjusted downward in response to changes in the nuclear industry. As is appropriate, the NRC is being scrutinized by its stakeholders for its response to these changes and the resulting use of resources. The agency can and should maintain focus on our mission while we take a hard look at our workload and how to achieve efficiencies.

We are confident that the agency is on the right track. Over $9 million in savings has already been identified through a comprehensive evaluation that involved staff at all levels of the agency, as well as stakeholder input. The savings, particularly in the areas of rulemaking, travel and corporate support are significant. However, through Project Aim, we are seeking additional efficiencies. Corporate efficiencies include centralizing financial management and human capital staff, and reducing information technology security costs. The NRC's safety and security mission remains paramount as actions are taken to re-baseline the agency.

The Project Aim Steering Committee has delivered to the Commission a rebaselining paper that outlines additional proposed efficiencies. While still under Commission review, the now-public paper reflects more than 140 activities that could be eliminated or reduced over the next 6 months, for a savings of about $41.1 million in fiscal year 2017. Total potential reductions identified over 18 months is $49.5 million. The staff will later submit to the Commission a paper outlining additional areas for longer-term efficiencies and projected workload changes through fiscal year 2020.

However, we cannot emphasize strongly enough that the NRC's ability to ensure adequate protection of public health and safety and the common defense and security will always be our main concern. While our size may change to reflect workload reductions and efficiency gains, the need for the great majority of the services we provide the American people remains unchanged.

As we proceed, the agency remains mindful of the importance of its highly skilled technical staff and the need to maintain our expertise. We must keep a focus on knowledge management as some senior staff retire and new experts take their place. We must not forget that the success of the agency is due, in no small part, to the quality and dedication of the agency's people. Remaining one of the best places to work in the Federal Government is important to our ability to continue to recruit the most talented candidates, and retain our skilled and knowledgeable technical experts.

I want to highlight one other area where the Commission is focusing on improvement: the Commission's involvement in the rulemaking process. Over the last several years, the Commission has revised its rulemaking processes to improve its understanding of, and, where possible, reduce the cumulative effects of regulations. These new processes include increased opportunities for stakeholder interactions and feedback, publishing draft supporting guidance concurrent with proposed rules, requesting specific comment on the cumulative effects of regulations in proposed rules, and developing better-informed implementation timeframes.

We are cognizant of the Committee's concerns as expressed in the fiscal year 2016 Joint Explanatory Statement regarding the timing of Commission involvement. The Commission directed the NRC staff last September to propose a plan for increasing the Commission's involvement in the rulemaking process before significant resources are expended. The Commission has just issued its direction on the proposed plan, which presented eight recommendations to better define and enhance the Commission's role in the early stages of rulemaking. We believe our approved approach meets the intent expressed in the report language and we will provide the requested information to the Committee in March 2016.

FISCAL YEAR 2017 BUDGET REQUEST

The NRC's proposed fiscal year 2017 budget is $970.2 million and 3,462 FTE, excluding the Office of the Inspector General (OIG). The proposal represents a net decrease of $19.8 million from the fiscal year 2016 enacted budget, as well as a decrease of 90 FTE.

The OIG's component of the fiscal year 2017 budget is $12.1 million, of which $11.2 million is for auditing and investigation activities for NRC programs and $1 million is for auditing and investigation activities of the Defense Nuclear Facilities Safety Board (DNFSB). These resources will allow the OIG to carry out its mission to independently and objectively conduct audits and investigations to ensure the efficiency and integrity of the NRC and DNFSB, to promote cost-effective management, and to prevent and detect fraud, waste, and abuse.

Under the provisions of the Omnibus Budget Reconciliation Act of 1990, as amended, the NRC fiscal year 2017 budget request provides for 90 percent fee recovery, less the amounts appropriated for generic homeland security activities, waste incidental to reprocessing activities and DNFSB activities. Accordingly, $861.2 million of the fiscal year 2017 budget will be recovered from fees assessed to NRC licensees, resulting in a net appropriation of $121.1 million. This appropriation is an increase of $2.1 million compared with the fiscal year 2016 enacted budget due to the inclusion of $5 million in non-fee-billable resources for advanced nuclear reactor technology.

The NRC carries out its safety and security activities through two major programs: Nuclear Reactor Safety, which includes both Operating Reactors and New Reactors, and Nuclear Materials and Waste Safety, consisting of fuel facilities, nuclear materials users, decommissioning and low-level waste, and spent fuel storage and transportation. Compared to the fiscal year 2016 enacted budget, the NRC's Nuclear Reactor Safety Program decreased by $3 million and 61.9 FTE; the Nuclear Materials and Waste Safety Program, including Decommissioning and Low-Level Waste, decreased by $1.8 million and 28.1 FTE.

I would now like to highlight portions of the fiscal year 2017 budget request.

NUCLEAR REACTOR SAFETY

Operating Reactors

The fiscal year 2017 budget request for the Operating Reactors Business Line is $587.5 million, a decrease of $1.7 million from the fiscal year 2016 enacted budget. This reflects declining or completed workload associated with, among other activities, implementation of the Fukushima lessons learned, license renewals and National Fire Protection Association 805 license amendment requests.

New Reactors

The fiscal year 2017 budget request for new reactors is $169.9 million, which represents a funding decrease of $1.4 million when compared with the fiscal year 2016 enacted budget. The decrease is a result of delays in application submittals, and project slowdowns or suspensions. The New Reactors Business Line is responsible for the regulatory activities associated with siting, licensing, and overseeing construction of new nuclear power reactors.

NUCLEAR MATERIALS AND WASTE SAFETY

Fuel Facilities

The fiscal year 2017 budget request for fuel facilities is $41.5 million, which represents an overall funding decrease of $2.9 million when compared with the fiscal year 2016 enacted budget. The Fuel Facilities Business Line supports licensing, oversight, rulemaking, international activities, research, generic homeland security, and event response associated with the safe and secure operation of various operating and new fuel facilities such as conversion, enrichment, and fuel fabrication facilities, and nuclear fuel research and pilot facilities.

Nuclear Materials Users

The fiscal year 2017 budget request for nuclear material users is $92.5 million, which represents a funding increase of $0.9 million when compared with the fiscal year 2016 enacted budget.

The Nuclear Materials Users Business Line supports the safe and secure possession, processing, handling of nuclear materials in many diverse applications, along with associated activities related to licensing, oversight, rulemaking, international engagements, research, generic homeland security, event response, and State, Tribal, and Federal Program interfaces. This increase is due to the resumption of security rulemakings and to address an industry petition for rulemaking. These were delayed in fiscal year 2016.

Spent Fuel Storage and Transportation

The fiscal year 2017 budget request for spent fuel storage and transportation is $37.2 million, which represents an overall funding increase of $1.1 million when compared with the fiscal year 2016 enacted budget. The Spent Fuel Storage and Transportation Business Line supports licensing, oversight, rulemaking, international activities, research, and generic homeland security associated with the safe and secure storage and transportation of spent nuclear fuel and other radioactive materials. This increase is due to safety and environmental reviews of an interim consolidated storage facility and related safety analysis.

Decommissioning and Low-Level Waste

The fiscal year 2017 budget request for decommissioning and low-level waste is $41.6 million, which represents an overall funding decrease of $1 million when compared with the fiscal year 2016 enacted budget. The Decommissioning and Low-Level Waste Business Line supports licensing, oversight, rulemaking, international activities, and research associated with the safe and secure operation of uranium recovery facilities, removal of nuclear facilities from service and reduction of residual radioactivity to a level that permits termination of the NRC license, and disposition of low-level radioactive waste from all civilian sources. The Commission has directed staff to proceed with a decommissioning rulemaking that would establish clear requirements for decommissioning reactors. Comments from stakeholders are being collected through March 18 of this year with the bulk of the work on the regulatory basis and proposed rule completed by the end of fiscal year 2017.

CLOSING

As I said at the onset, this budget request represents a substantial reduction from the 2016 enacted budget. The President's Budget takes advantage of the Project Aim-identified efficiencies, and, as we continue our work, we anticipate additional savings and efficiencies to come.

Chairman Alexander, Ranking Member Feinstein, and distinguished Members of the Subcommittee, this concludes my formal testimony on the NRC's fiscal year 2017 budget request. On behalf of the Commission, I thank you for the opportunity to appear before you. We look forward to working with you on the 2017 budget and going forward. I know you share our dedication to the vital mission of the NRC.

I would be pleased to respond to any questions that you may have. Thank you.

Senator ALEXANDER. Thanks, Mr. Chairman.

And we'll each take 10 minutes for questions, and then we'll go from there.

CURRENT STATE OF THE POWER REACTOR FLEET

Mr. Chairman, it sounded like you mentioned seven reactors. You're monitoring four and are considering three more applications. Is that right?

Mr. BURNS. We have the four——

Senator ALEXANDER. Tell me—tell me where they are.

Mr. BURNS. Okay. We have the two Vogtle plants in Georgia and the two Summer plants in South Carolina are under construction.

Senator ALEXANDER. Okay.

Mr. BURNS. In the last year, we have approved the combined license applications for the Fermi Unit 3 and the South Texas Unit 3 and 4 plants. Now, what the companies there have indicated——

Senator ALEXANDER. Is that two more?

Mr. BURNS. That's—well, actually, it would be three—actually it would be three more plants.

Senator ALEXANDER. Okay.

Mr. BURNS. Now, what they've indicated they're going to do is in effect—they've gone through the process of receiving the license, but they're going to bank—if you will, bank the license until they determine probably in early 2020 or thereabout, whether they would proceed, you know, whether the conditions are right to proceed with construction of those plants.

Senator ALEXANDER. Yes. So——

Mr. BURNS. And we also have a couple other plants which we expect to see from I think Duke, I think it's the Lee and the Levy plant this year, which we would also be asked to act on a combined license for.

Senator ALEXANDER. Those are new.

Mr. BURNS. Those would be new sites, yes.

Senator ALEXANDER. So four under construction.

Mr. BURNS. Four under construction.

Senator ALEXANDER. Three new reactors in Texas that are in the application process.

Mr. BURNS. Well, two in Texas that received the combined license. They could proceed with construction today.

Senator ALEXANDER. Yes. And where's the third?

Mr. BURNS. In Fermi, which is in Michigan, near the Michigan-Indiana border.

Senator ALEXANDER. Yes. And then two more?

Mr. BURNS. Yes. It's—is it two or—it's two—it's two more. Under the Duke Power and the locations, I've——

Senator ALEXANDER. Yes. So that's four——

Mr. BURNS. In the southeast——

Senator ALEXANDER. That's four, three, and two.

Mr. BURNS. Yes.

Senator ALEXANDER. The way I'm hearing you, that's seven and nine.

Mr. BURNS. Yes. Yes. And then——

Senator ALEXANDER. They're potential new reactors.

Mr. BURNS. Yes, the—yes.

Senator ALEXANDER. In various stages of——

Mr. BURNS. Yes.

Senator ALEXANDER. Now, how many reactors—we have 100 today, right? With the opening of Watts Bar, if you count Watts Bar.

Mr. BURNS. Correct.

Senator ALEXANDER. But how many are being decommissioned or closed?

Mr. BURNS. Well, there are announcements for two sites in the Northeast—the FitzPatrick plant in upstate New York, and the Pilgrim plant south of Boston—which Entergy has announced that it would be closing down. I think FitzPatrick in 2017, and——

Senator ALEXANDER. What about the California sites that we talked about?

Mr. BURNS. Well, San Onofre has already been closed. The other——

Senator ALEXANDER. So that's already in your——

Mr. BURNS. Yes. Yes.

Senator ALEXANDER. So you know of two sites that would be closed.

Mr. BURNS. In addition to sites that are already under decommissioning, such as the San Onofre site in Southern California.

SAFETY RECORD OF U.S. REACTORS

Senator ALEXANDER. Yes. So it's 100 potentially, plus 7, minus 2, potentially, that we know.

Let me start this out by asking you a few questions about the safety record, because Senator Feinstein very properly brings this up. How many in the United States—we have 100 reactors—how many deaths have there been in the history of our commercial nuclear program associated with reactor accidents, with the failures of the reactor?

Mr. BURNS. With—from a radiation-induced accident, none that I know of.

Senator ALEXANDER. Okay. Let me ask Mr. Ostendorff—although I could ask you—how many deaths have there been associated with Navy reactors?

Mr. OSTENDORFF. None.

Senator ALEXANDER. Three Mile Island was our most celebrated nuclear accident in the United States. That was in 1978? No——

Mr. OSTENDORFF. '79.

Mr. BURNS. Nine. Nine.

Senator ALEXANDER [continuing]. 1979. How many people were hurt at Three Mile Island?

Mr. BURNS. From radiation, none.

Senator ALEXANDER. None. And that's despite the fact that there has been monitoring probably still going on, maybe not, but there was monitoring at least for many years of individuals in that area to make sure that no one had radiation sickness as a result of the accident.

So no, no let me go further than that. We have used fuel, which we would like, both of us, and Senator Murkowski is now here, chairman of our authorizing committee, we have used fuel on 75 sites or so around the country that we would like to begin to move to either a consolidated site, or I would like to move to Yucca Mountain. What is the Commission's view of the safety of the storage of the used fuel on those—at those 75 sites?

Mr. BURNS. We believe it's safe. We monitor it. We, in some—we will license the fuel storage at those sites, and we monitor and inspect it. We also license and review the casks, and we believe it's safe, can be safely held there.

Senator ALEXANDER. Yes. Okay.

Senator Feinstein, we have Senator Murkowski here now. I think what I'll do is stop my questions at 5 minutes and go to you for your questions, and then go to Senator Murkowski. Would that——

Senator MURKOWSKI. That is fine.

Senator ALEXANDER. We're glad you're here.

So Senator Feinstein.

DIABLO CANYON POWER PLANT

Senator FEINSTEIN. Thanks, Mr. Chairman.

As part of its response to Fukushima, the NRC has asked all nuclear plants for information regarding seismic and flooding hazards, as I understand it. And I think this analysis is of particular importance in Diablo Canyon, which sits on the California coast near a series of fault lines. For each fault line, I understand—and correct me if I'm wrong—the NRC will compare the newest evidence of potential ground movement against the design tolerances of the plant. Is that correct?

Mr. BURNS. Yes. Yes, that's my understanding. We have them, as we have plants across the United States, doing a seismic reevaluation. I believe the Diablo Canyon final report is due in about a year. In the meantime, we believe that the plant is safe to operate taking into account knowledge that's been developed regarding the faults and the new designs that we know of with respect to seismic activity.

Senator FEINSTEIN. Right. And if I understand this correctly, your staff has confirmed that the new seismic data is, quote, of sufficient quality and suitable, end quote, for conducting this final risk analysis. And then that report will be out in September of 2017. Is that correct?

Mr. BURNS. That's correct.

Senator FEINSTEIN. Okay. So can you talk a little bit—because this is one reactor that's had a lot of public concern around it, as you know—why does it take so long to complete the risk analysis? And what makes you confident that there are no safety concerns in the interim?

Mr. BURNS. Well, Diablo Canyon, I think as you are well aware, since its original licensing, there has been a high degree of focus on seismic—the seismic profile, the seismic design basis for the plant, and as new knowledge is developed, as the science developed, that's fed into it. Why we're confident with respect to the safety of the plant, pending the evaluation, is because the parameters that have been used in licensing allow a very robust design, they envelop some of what we are seeing from the potential information from other fault lines or other material.

Part of the reason it takes that long is to do the science well, and also, you know, the availability of top experts to conduct that work. Again, I want to assure you, from our standpoint, we believe that pending the outcome of those evaluations and what it may show, we think the plant is safe to operate.

SAN ONOFRE NUCLEAR GENERATING STATION

Senator FEINSTEIN. Got it. Thank you. I want to get in my time the second reactor site, which is the decommissioning at San Onofre. I understand they're moving ahead with expanding their dry fuel storage area, and their plans include demolishing the reactor buildings on an expedited timeframe, potentially concluding work in 2027. And I understand that you have issued all the necessary approvals, and if the State does the same, physical dismantlement could become—could begin next year. Is that correct?

Mr. BURNS. That's my understanding.

Senator FEINSTEIN. Okay. Can you confirm that the NRC will continue to inspect the site and oversee the decommissioning program to ensure safety?

Mr. BURNS. Yes. That's part of our normal program. It would be not only for San Onofre, but the other sites that are under decommissioning.

Senator FEINSTEIN. Okay. Now, what are the biggest risks in your view to completing the decommissioning process in a safe and timely manner?

Mr. BURNS. I think if I—Senator, one of the things I learned from a site visit to the Zion plant, which is north of Chicago undergoing decommissioning, it's not so much the biggest risk, but the biggest challenge and I think the biggest focus is sound planning, because you want to be able—you want to—when you're taking apart the facility, you want to do it in a way that minimizes occupational exposure of radiation to workers, but not only that, you also have to worry about making sure you're not getting overexposure to heavy metals and other types of chemicals that may have

been used appropriately at the site. So my sense is it's sound planning.

I met with the folks from San Onofre, as I think some of my colleagues are——

Senator FEINSTEIN. Good.

Mr. BURNS [continuing]. And, again, I think they have—my sense is that they have that understanding, that good planning as you go into the process for not only the dismantling, but the planning for the spent fuel storage pad and the dry storage, is underway. So I think keeping a good focus on that planning, from my standpoint, is the biggest challenge.

Senator FEINSTEIN. Let me ask you this, Does the NRC have contact with the CEO, who actually, you know, made the decision, and I think is a very constructive and cautious individual who wants to do the right thing? Do you keep in touch, or is it with the technical staff that you keep in touch?

Mr. BURNS. Well, sometimes I forget maybe the titles, but I met with the manager, actually I saw him yesterday at another conference, who is responsible for laying out the planning for it. So we do have interaction. I think they try to reach out to us to let us know where their plans are. So there's an engagement, I think, both at the management level within the company, as well as, importantly—obviously importantly—the technical level within the agency.

Senator FEINSTEIN. Well, the reason I ask is I know technical people and professional people are very good, but I think it's very important that the person of a big company who makes the decisions really keeps in contact, or you keep in contact with him, so that he gets firsthand information in the case anything goes a little out of the normal. And would you agree to do that?

Mr. BURNS. Certainly.

Senator FEINSTEIN. Thank you.

Senator ALEXANDER. Thank you, Senator Feinstein.

We welcome Senator Murkowski, chairman of the Energy Committee.

Senator MURKOWSKI. Thank you. Appreciate the opportunity to be with you to discuss some of the nuclear issues, and again to thank you both for your leadership as we try to figure out some solutions when it comes to nuclear waste. I know we haven't picked up that baton yet in 2016, but I think the commitment still is there. Know that I certainly share that with you, that we're going to figure this out. So thank you for that.

And thank you to our commissioners for the work that you do.

And, Commissioner Ostendorff, I understand that you're going to be signing out of here at the end of this fiscal year, so thank you for your service.

SMALL MODULAR REACTORS

I want to direct my questions this afternoon to small modular reactors and where we are, and just kind of have some sense of understanding, because what I'm hearing are just horror stories in terms of the length of time that this process is taking and the costs involved.

So we understand that NRC is preparing to receive full license applications for SMRs. So the question is, How long do you expect that a full application review of an SMR would take? Have you identified some of the barriers that we clearly know are in place, either legislative or regulatory, so that we can have a more expedited and yet thorough review of these full SMR applications? And I throw that out to all of you here.

Mr. BURNS. I'll start off, and please—and joined by my colleagues.

One of the things I want to make sure when we talk about small modular reactors is what we do expect to receive. We expect to receive an application from NuScale at the end of this year for a small modular reactor. It's a light-water reactor base. But I want to make sure I distinguish between small modular reactors we may receive in the next few years and the longer term look at advanced reactors, which are non-light-water reactor designs, which are coming, and which we've been having a lot of engagement with the Department of Energy with some vendors on.

Back to your question in terms of what we have before us. We've been interacting with NuScale to make sure we both understand each other before the application comes in and so that we're well prepared for it. Again, I expect we will receive it at the end of this year. My expectation is the design certification would take on the order of about 3 to 4 years for the review of that application.

Senator MURKOWSKI. So it is correct—I'm told that they will—they expect to have spent—"they" being NuScale—$1.1 billion by the time construction begins on their first NuScale unit. That's a cost, I'm told, of about $268 billed per NRC man-hours given the review time that has been outlined.

So in terms of cost to the agency to do all this, cost to the entity that's making the application, can't we build a better mousetrap here?

Mr. BURNS. Well—go ahead, Commissioner.

Mr. OSTENDORFF. I just want to clarify one thing. The last 2 weeks I've had a chance to speak at two conferences with the NuScale Chief Operating Officer Mike McGough. It was out at Oak Ridge National Laboratory the week before last, and last week I spoke at Platts. Mike McGough was at both of these sessions, and he is their primary face in Washington, D.C. And I want to separate out the regulatory cost from the total cost.

Senator MURKOWSKI. Okay.

Mr. OSTENDORFF. I think the total cost you're talking about, Senator, is about the same number I've heard. That is not all regulatory cost. That is the cost to go and design, hire staff, and do test work to ensure there's a safe design that can be submitted. When I asked Mike McGough, "What is your concern with the NRC and our regulatory hat as far as the cost?" he says that that cost is a small proportion, or is a small portion, of their overall cost.

Last June, June 2015, the NRC published a Federal Register Notice, 118 chapters, was called the "Design Specific Review Standards" that would be the guidebook that our staff would use to review that NuScale license application, which has not yet come in to the agency, but is expected in December of this year. And I asked Mike, "How is that going? How is your company looking at

this design specific review standard process?" He told me he's satisfied with it.

So I think there's a lot of numbers that get thrown around and so forth. I don't believe the $1.1 billion is anywhere close to regulatory costs, which is a lot, lot lower than that number.

Senator MURKOWSKI. So——

Mr. OSTENDORFF. And we can provide feedback to you.

Senator MURKOWSKI. Well, and I think it would be helpful to have a handle on what real numbers are. But further to the point, I think there's a recognition that this is—this is lengthy, it's complicated, and it's expensive, and if there are ways that we can be more efficient, not only with the Commission's time, but again for the applicants, are there ways that we can work to enhance efficiencies, either through the regulatory or the legislative track? And I guess that's what I would hope for.

And I think, Chairman Burns, you mentioned working with folks within DOE. Are we seeing greater communication back and forth so that everybody is working together? I want to know that we're not at odds with one another as we're trying to enhance these efforts.

Mr. BURNS. No, I don't think we're at odds. What we do, we have good communication with DOE. Obviously, we have the arm's length relationship because we have the regulatory responsibility, they have more of the research and development responsibility.

But we, for example, in the advanced reactor areas, we held a workshop last May with DOE and invited people who are interested in potentially advanced designs to come to that. We're having another workshop co-sponsored with DOE this coming June. I meet with John Kotek about quarterly—you know, three to four times a year—on issues. We're looking for again in the advanced reactor area. They did some work, which we have under review with respect to how the general design criteria that have been largely used in light-water reactor applications, how do they line up with these non-light-water reactor designs that may be coming in?

So I think we've got good communication, and we'll continue to work within our respective scope of responsibilities well together.

Senator MURKOWSKI. Mr. Chairman, my time has expired. So I thank you for the opportunity to ask these questions, but to each of you, know that this is something that I'm going to continue to press and inquire on because my observation—or at least the people that are coming to me are saying it's lengthy, it's costly, there must be some way that we can be a little more efficient there.

But thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Murkowski.

Mr. Chairman, have you requested sufficient funding in your budget to perform the review of the small modular reactor application when it comes?

Mr. BURNS. Yes, we have.

Senator ALEXANDER. And are the regulations in place that you need to have in place in order to review the design?

Mr. BURNS. Yes. We have the basic design certification framework. And as Commissioner Ostendorff discussed, we have this design—help me out here.

Mr. OSTENDORFF. Design specific review standards.

Mr. BURNS. Thank you. Design specific review standards that will help and carry out the review.

CONSOLIDATED INTERIM STORAGE

Senator ALEXANDER. Let me switch to something that I know Senator Feinstein is interested in, and I believe Senator Murkowski, too, and that's the—you said you expected to receive one application for a private consolidated storage facility this year. Is there a possibility there might be more than one?

Mr. BURNS. Yes, there could be more than one. We expect from waste control specialists in western Texas sometime within the next 2 to 3 months, I believe, and then the Holtec or Eddy Lea Alliance, which is on the other side of the border in New Mexico, later this year, I don't have the exact timeframe and——

Senator ALEXANDER. Yes. And, of course, my view is that we ought to proceed on all these tracks at once. Senator Feinstein—I don't want to speak for her—she is not prepared to say the same thing on Yucca Mountain, but I don't—I think we ought to move on all the tracks at once if we want to do something about nuclear waste. How long would you expect the Commission's review of the application for a private storage facility to take?

Mr. BURNS. I would expect about a 3- to 4-year period. Now, that may—if there is a hearing requested and a hearing granted, there might be somewhat more time on that, but generally about a 3-year period.

Senator ALEXANDER. Do you have sufficient resources to review the application? Have you requested enough funding in the new budget to continue that review into next year?

Mr. BURNS. We have in the request specifically requested or have funds specifically provided for, for one—for at least one application. If we get the second application, we would look at reprioritizing some work and do it, but we would—we would——

Senator ALEXANDER. So the answer would be yes.

Mr. BURNS. Yes, we would go, yes, and continue forward with the review.

Senator ALEXANDER. Do you have all the legal authorities that you need to license a private consolidated storage facility?

Mr. BURNS. Yes. Yes, we do. And we have done—we have actually done this kind of review at an earlier time for a facility that did not go forward.

ADVANCED NUCLEAR REACTORS

Senator ALEXANDER. You mentioned advanced nuclear reactors. What kind of reactors do you consider to be advanced reactors? This is different than small modular reactors.

Mr. BURNS. Right. This would be different types of design, a high-temperature gas reactor, a pebble-bed reactor, and modernized forms of some reactors, a molten-salt reactor. There are different types of designs.

Senator ALEXANDER. And what kind of work are you doing on those types of designs?

Mr. BURNS. Well, we have some limited work that we're doing now. With the $5 million off fee proposal, we would continue work on regulatory infrastructure addressing some of these issues about

readiness to handle those. There are some technical—I think some technical issues we would do, and then also engagement with the companies or entities who may be interested in it, and also continue an engagement internationally, for example, the Generation IV Forum, which is a group of countries, including the United States, that is interested in the potential advanced reactor design.

Senator ALEXANDER. I wonder if any of the other commissioners would have any comment about the role of advanced nuclear reactors in the future for our country.

Mr. OSTENDORFF. I'll comment, Senator, because I had a chance just 2 weeks ago to be out in your State at Oak Ridge to talk at a conference on advanced reactor technology development. And there's a lot of interest out there. There were 21 different vendors that were represented at this conference for 2 days. As the chairman mentioned, there are technologies being discussed. There are non-light-water reactors, very different from our current reactor fleet, very different from small modular reactors. I heard one that was being discussed that was a lead-bismuth design. I never heard of that before, but in addition to pebble-bed and molten-salt, as the chairman mentioned.

So there's a lot of interest in different technologies. I think most of these are very interesting, and some of them have promise, but I think at the end of the day, the vendors and the investors, especially the venture capital community, is trying to look at, Does this make economic sense? So I think the economic question is perhaps the biggest one rather than a technical question.

Senator ALEXANDER. Yes, Commissioner.

Ms. SVINICKI. Chairman Alexander, may I state or bring to the subcommittee's attention that although it is true that these advanced reactor types are very different than what we have in commercial generation now, the history of nuclear power development in the United States, is that actually many of these concepts are where we began as a country. If you visit Oak Ridge National Laboratory, Idaho National Laboratory, you find that we developed small scale prototypes of some of the sodium-cooled reactors.

So it's a very interesting challenge to try to access some of that knowledge from 50, 60 years ago, and many of those leading experts have retired, but there is in the Department of Energy, and Atomic Energy Commission history a lot of relevant information, and in this country, we tried a lot of these things.

Senator ALEXANDER. That's very interesting.

Commissioner Baran.

Mr. BARAN. I'll just briefly add, going back to the budget piece of this, I think the approach of funding advanced reactor activities separate from the fees licensees pay actually make a lot of sense here because I'd have a hard time justifying charging current plants for the work we're doing to get ready for future advanced reactor applications. I think having it separate from the fees is a fairer approach, but it makes sure that we have the funds we need to move forward on some of these regulatory and technical issues.

Senator ALEXANDER. Thank you. Thank you for that.

Senator Feinstein.

Senator FEINSTEIN. Thanks very much, Mr. Chairman.

The chairman asked the questions, you know, how many people have died as a product of a nuclear accident, and it hasn't happened. That sort of really isn't my goal in this. My goal is I know what can happen, and the key is to prevent it from happening.

CRYSTAL RIVER NUCLEAR PLANT

Let me ask you some questions about the Crystal River plant in Florida, which I gather operated for 36 years. We're talking about 80-year licenses now. And apparently the concrete began to separate in the dome, and that led to its shutdown. Could you tell me a little bit about that and what happened? Because if we're going to go for 80-year licenses, we ought to—and I just went into the faulty steam generators in San Onofre, and I suppose they could have, you know, patched them and kept operating, but they did the responsible thing and decommissioned it. And that—I've been there, and that site has been impeccably maintained by Southern California Edison, at least what somebody who is not a professional could see.

So could you talk about, just a little bit about, what happened at Crystal River in Florida?

Mr. BURNS. Yes, I can. We can provide you maybe some—probably more granular information than I probably have. But what—the issue of concrete degradation at Crystal River, as I understand it, was in part because of some of the evolution or operations they undertook there, which had an adverse impact on the concrete. And noting that, when we look at subsequent license renewal, and we look at the things that we are most concerned about, in terms of aging management, particularly when you talk about passive long-lived components, well, one of them is—one of the issues is for us, and that we do, do and have done research on, are doing research on, and will look at as part of the renewal review, is the question of long-term adequacy of concrete structures at a site. So that is certainly something we look at in terms of and is of concern to us, as is, for example, the integrity of the reactor pressure vessel, certain piping, certain cabling, on the long term.

Senator FEINSTEIN. Do you have people that know what to look for? And has the Commission seen the concrete degradation at Crystal River?

Mr. BURNS. I believe—I believe we have—yes, I believe our inspectors have looked at it and—because when I think it was discovered several years ago, my understanding is the licensee was considering whether or not it would restart the facility, whether it would do appropriate repair work, could do appropriate repair work, ultimately made a business decision to shut the facility down.

Senator FEINSTEIN. Yes.

Mr. BURNS. But it is something we certainly were aware of. They—when discovering those conditions, they would have had to report those conditions to us, and we would have seen it through our inspection program. So, yes, in that sense, very much so something we were aware of, became aware of.

Senator FEINSTEIN. Commissioner Ostendorff.

Mr. OSTENDORFF. I just wanted to add one specific aspect to Crystal River. There was a maintenance error by the utility. Let's

pretend that this water bottle is the containment, and pretend there's a rubber band around the circumference of this water bottle. The water bottle is being compressed by this rubber band. Now think that this is a containment made of concrete, and there's a cable, rather than a rubber band, around this bottle. Improper detensioning of that cable during maintenance is what caused the crack——

Senator FEINSTEIN. Is it improper——

Mr. OSTENDORFF. Detensioning. There's this cable that was supposed to be——

Senator FEINSTEIN. Detensioning, which means loosening?

Mr. OSTENDORFF. It means loosening.

Senator FEINSTEIN. Okay.

Mr. OSTENDORFF. Take the rubber band off.

Senator FEINSTEIN. Right.

Mr. OSTENDORFF. And so when that cable was detensioned improperly, you had irregular application of forces to the containment, and that was the root cause of why the concrete cracked.

Senator FEINSTEIN. Well, is that possible in other plants or is it isolated to Crystal River?

Mr. OSTENDORFF. Well, I think the procedure itself could happen someplace else. I think that Duke Energy learned a very expensive lesson here in that maintenance error. I want to make sure it was maintenance error that caused the concrete to fail. We have a lot of people that do detailed reviews of concrete structures in nuclear power plants around the country. There's been a concern that the Seabrook plant in New Hampshire that we have spent a lot of time with industry and outside research groups to understand and are satisfied with the concrete structure at Seabrook. But there's a lot of attention paid to this particular area.

Senator FEINSTEIN. Well, that's good, but how was it brought to your attention about Crystal River?

Mr. OSTENDORFF. Well, this was a pretty catastrophic failure. I think Commissioner Svinicki probably has been to the plant, and we've both been there. You see the cracks on the containment itself that occurred, you know, I don't know, like 6 or 8 feet long, something like that, after the cable was taken off inappropriately.

Senator FEINSTEIN. Okay.

Mr. OSTENDORFF. It was visually detected by the licensee and at the same time by our resident inspectors.

LESSONS LEARNED FROM FUKUSHIMA

Senator FEINSTEIN. Yes. If someone were to ask this question—and I'm about to—what were the lessons for NRC from Fukushima?

Mr. BURNS. Well, I'll start. I think our primary lesson, which actually reinforced a concept that we had adopted or pursued after the terrorist attacks in 2001, and that was being prepared for things that you don't expect to happen that may go beyond where the design is, and that is, for example, if you lose—what happens at Fukushima is they lose electric power that allows them to proceed with cooling of the reactors there.

So the primary lesson, and where I think that the agency has had and that the industry had, is, How do you cope with those

things if those worst case things and beyond your design basis things happen? So positioning additional diesel generators to provide power, pumps because you may have lost important pumps, cabling, electrical supply, positioning those things onsite, and what the industry has also done is it's established two——

Senator FEINSTEIN. I don't mean to interrupt you.

Mr. BURNS. Yes.

Senator FEINSTEIN. But does that mean a secondary system of redundancy?

Mr. BURNS. It's redundant equipment that can go in and be used to help with the recovery, for example, of electricity if you need electric power within the plant.

Senator FEINSTEIN. Well, why are they still pumping radioactive water into the ocean?

Mr. BURNS. Who——

Senator FEINSTEIN. At Fukushima.

Mr. BURNS. I don't know that they are pumping radioactive water——

Senator FEINSTEIN. I believe they are.

Mr. BURNS [continuing]. Into the ocean because the Japanese have been——

Senator FEINSTEIN. There is still some that apparently goes into the ocean. At least I read about that in a magazine.

Mr. BURNS. Yes. Yes. Well, the Japanese have been extraordinarily conservative about what they will allow to go into the ocean, in fact, to the point that some—that they have—they control water, they decontaminate the water of the very—sort of high-level radionuclides and leave—you basically have tritiated water, tritium——

Senator FEINSTEIN. Yes.

Mr. BURNS [continuing]. Water with tritium. So they've been extraordinarily—trying to be extraordinarily careful about that.

Senator FEINSTEIN. Well, what I was told, it's a no fishing zone, and so I asked, "Why is it a no fishing zone?"

Mr. BURNS. Yes.

Senator FEINSTEIN. It's because of water going into the ocean that's contaminated. So——

Mr. BURNS. Yes. I am not particularly—I would have to say I am not particularly aware of what their current restriction is. Certainly, they had, after the accident, restrictions. I don't know what they are today.

Senator FEINSTEIN. I'll find out.

Mr. BURNS. But what I'm trying to help visualize is that before you get to that state is look—thinking about ways of if you've lost certain systems in the plant, restore them to the point that you can get the safe shutdown so you don't have the melted reactor core, that you provide—that you mitigate the consequences of the accident and prevent releases to the extent you can.

Senator FEINSTEIN. Commissioner.

CRYSTAL RIVER NUCLEAR PLANT

Mr. OSTENDORFF. Senator, I would like to provide a clarification to my response on Crystal River. I should have told you a significant fact. At the time this containment cracking occurred in the

concrete, the reactor was fully shut down and cooled down. It was in a maintenance period. I did not tell you that. I apologize.

Senator FEINSTEIN. Thank you. That's helpful. Thank you.

Senator ALEXANDER. Mr. Chairman, isn't the—isn't——

Are you ready for me to——

Senator FEINSTEIN. I'm finished.

LESSONS LEARNED FROM FUKUSHIMA

Senator ALEXANDER. Mr. Chairman, isn't the answer to Senator Feinstein's question that the lesson from Fukushima is that you need to make sure you have water to cool the reactors or the spent fuel rods?

Mr. BURNS. Yes. I would say you need—one thing that you need, you need electricity because——

Senator ALEXANDER. Well, no, no. In the answer, you needed water.

Senator FEINSTEIN. Yes, I——

Mr. BURNS. You need a cooling water——

Senator ALEXANDER. I'm not asking you how you get the water——

Mr. BURNS. Okay.

Senator ALEXANDER [continuing]. I'm saying in the problem, you didn't have water to cool the rods or the reactors.

Senator FEINSTEIN. Sufficient.

Senator ALEXANDER. Isn't that right?

Mr. BURNS. Yes. Yes. Yes.

Senator ALEXANDER. Right. And then you can go into a whole bunch of explanation about how you have redundant ways to do that, but it was a fairly simple problem, if I'm correct. You didn't have water to cool rods that were in the reactor or that were used fuel.

Mr. BURNS. And most—I would say the primary reason for that is the tsunami knocked out the diesel generators.

Senator ALEXANDER. Yes, but if you're analyzing the problem, the problem was you needed water.

Mr. BURNS. Correct.

Senator ALEXANDER. Right. And the response has been, if I'm not mistaken, that you've begun a process throughout our reactors in the United States to create redundant ways to provide water in case of unanticipated problems so that that doesn't happen here.

Mr. BURNS. Correct. You're trying to get to safe shutdown, and that's what those redundant systems will help you do. That's what we're looking at.

Senator ALEXANDER. Right. But basically so that it's not held out to be some big scientific mystery——

Mr. BURNS. No.

Senator ALEXANDER [continuing]. You just need to make sure water is there to cool the—to cool the—now, tell me if I'm wrong about that, but I think that in the end is the problem, that the water is available for the rods and the reactor and/or in spent fuel.

Mr. BURNS. That's correct. So you achieve then a safe shutdown and equilibrium.

Senator ALEXANDER. I mean, walking around Watts Bar, which is just about to begin to produce electricity in our region, you know,

I saw—and I think that was the first of the new plants that had newly redundant—or one of the first, maybe the first—that newly redundant facilities to try to take into account Fukushima. Is that correct, as you came out of your review of the Fukushima disaster and what we do about it here?

Mr. BURNS. Yes. I think that's correct. They were one of the first with this flex equipment.

Senator ALEXANDER. And they made a decision, I think, to go in an accelerated way basically to do almost anything that was suggested that might avoid that sort of problem. That was the sense I got.

Mr. BURNS. Yes. They—yes, certainly, I—and I think probably given where they were in terms of licensing and coming on as a new plant, they wanted to get that done, and also it helps in terms of Unit 1 needs—needed support as well.

YUCCA MOUNTAIN LICENSING

Senator ALEXANDER. Right. Let me just ask you some questions about Yucca Mountain, which shouldn't take long to answer.

Is the Commission following the court's order?

Mr. BURNS. Yes, we are.

Senator ALEXANDER. The next step in the licensing process is to complete the Supplemental Environmental Impact Statement. How much will that cost?

Mr. BURNS. I believe that the remaining—I think that costs about $3 million.

Senator ALEXANDER. I've got $1.1 million. Would that be right?

Mr. BURNS. Okay. That was probably accurate.

Senator ALEXANDER. Do you have $1.1 million to do that?

Mr. BURNS. Yes. And we expect to issue it by mid-year.

Senator ALEXANDER. By mid-year of this year.

Mr. BURNS. This year. This year.

Senator ALEXANDER. Thank you. Would you agree the next step of the licensing process is to restart the hearings before the Atomic Safety and Licensing Board?

Mr. BURNS. Yes. A next step would be the hearing process.

Senator ALEXANDER. I believe that you testified last year that—that—well, it would take an additional $330 million to obtain the construction authorization for Yucca Mountain. Does that sound correct?

Mr. BURNS. Yes. That's the estimate we've had.

Senator ALEXANDER. Do you have the $330 million to do that?

Mr. BURNS. No, that would have to be appropriated.

Senator ALEXANDER. Mm-hmm. Why was that not in the President's—in the budget request?

Mr. BURNS. This is the administration's budget. The administration did not provide for additional funds on Yucca Mountain.

Senator ALEXANDER. Yes. Well, we—you know, I think it's fair to characterize—and she will correct me if I'm wrong—we are united on the urgent desire to break the nuclear waste stalemate; we're not on what to do about Yucca Mountain. For me, it seems to me plain that it's the law, that the court has ordered moving ahead. Your own environmental scientists have said that it's safe for 1 million years. We get frequent lectures about the importance of fol-

lowing science, and following the law and following science, we would then have a place to put a great deal of the spent nuclear fuel we have at sites all around the country, and we could also get agreement with the House of Representatives to move ahead with our short-term repositories in our private facilities.

So we will keep working on our part. That's not necessarily your problem. But you're going to be continuing to hear from me that I think that you should follow the law and follow the science and move ahead with Yucca Mountain. Senator Feinstein, I don't have any other questions.

Senator FEINSTEIN. I have—I would like to.

Senator ALEXANDER. You're welcome to ask anything you would like.

FUKUSHIMA

Senator FEINSTEIN. If I may, Mr. Chairman, I would like to put in the record a February 10 "Washington Post" article, "How Is Fukushima's Clean-Up Going 5 Years After Its Meltdown? Not So Well." And my staff has prepared a couple of brief papers on Fukushima clean-up, that radioactive water remains a big problem at Fukushima. Initially water used to cool the reactor cores was stored in huge tanks, but they have leaked and continue to do so. There are about 1,000 tanks on the site holding 750,000 tons of water. And that goes on.

A second one on the NRC has required two types of actions following the Fukushima disaster.

And a third one on the number of fish with excessive levels of radiation have been significantly reduced.

So I would ask that those documents be entered into the record, if I might.

Senator ALEXANDER. They will be.

[The link for "Washington Post" article follows:]

https://www.washingtonpost.com/world/asia__pacific/five-years-after-nuclear-meltdown-no-one-knows-what-to-do-with-fukushima/2016/02/10/a9682194-c9dc-11e5-b9ab-26591104bb19__story.html?utm__term=.c73d78c27db8.

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

Senator ALEXANDER. Any other questions or comments?

Senator FEINSTEIN. No, I think I'm fine.

And let me thank you all for your service. I think it's a very serious thing because we all look at things, and unless something has happened, you know, it's hard to believe that it's going to happen on a major basis. And maybe because I live in a State where everywhere is 5 miles from an earthquake fault, I know it can happen. And so that kind of changes your view of things, because it's on your watch, and if you know something can happen, you have an obligation to do something about it.

Someday I'll tell the chairman a story of how I learned that when I was mayor of San Francisco.

Senator ALEXANDER. I think you've already told me.

Senator FEINSTEIN. I've already told you, but I really——

Senator ALEXANDER. And you did the right thing about the baseball stadium; right?

Senator FEINSTEIN. That's right.

Senator ALEXANDER. No, no. She is making very good points, and I know that it's points that each of you agrees with because that's what you do every day. And I would also join Senator Feinstein in thanking you for your service.

Commissioner Ostendorff, thank you for your term of service.

Senator FEINSTEIN. Yes.

Senator ALEXANDER. But thanks to every one of you and to your technical staff, some of whom are here. I've been to the reactors with you and I've seen the technical staff and how it operates and the rigor of it, which is pretty obvious, even to a layman. And I think it's a pretty remarkable record that we have in the United States. It's not—of course, a reactor, if there is a problem, could cause severe damage to property and to people. Fortunately, that hasn't happened to us in the United States, either in the military or in our commercial reactors, and that's because you're accountable and you've made the operators accountable, and we have a very strict safety protocol.

So as long as we are a country that uses 25 percent of all the electricity of the world, more or less, and as long as one of our major national priorities, at least a majority of the people, is to do what we can to reduce the human effect on climate change, and as long as 100 nuclear reactors produce 60 percent of our carbon-free electricity at a pretty low cost, and it's reliable as well, I think we ought to do all we can to create an environment in which we can continue to operate nuclear reactors safely.

So we'll look forward to working with you on the budget. I think you actually have an exciting period of time coming up as these different forms of reactors—small, advanced, whatever they may turn out to be—come along, and we look forward to working with you on them.

I also want to thank you for being responsive to our staff on both sides of the aisle.

Senator FEINSTEIN. Yes.

Senator ALEXANDER. That's very important, when we ask questions, we get answers, and I think so far we're doing—we feel pretty good about that, and we thank you for that.

Senator Feinstein, I think, unless you have further comments, that concludes the hearing.

Senator FEINSTEIN. No. Well done, Mr. Chairman.

And let me just, too, say thank you. I mean, this is a very big deal, what you do, so I for one am very, very grateful. Thank you.

Mr. BURNS. Thank you.

SUBCOMMITTEE RECESS

Senator ALEXANDER. It's adjourned.

[Whereupon, at 3:52 p.m., Wednesday, February 24, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2017

WEDNESDAY, MARCH 2, 2016

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

The subcommittee met at 2:33 p.m., in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Cochran, Murkowski, Hoeven, Lankford, Feinstein, Tester, Udall, and Coons.

U.S. ARMY CORPS OF ENGINEERS AND BUREAU OF RECLAMATION

HON. JO-ELLEN DARCY, ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS), CORPS OF ENGINEERS—CIVIL, DEPARTMENT OF THE ARMY, DEPARTMENT OF DEFENSE—CIVIL

ACCOMPANIED BY THOMAS P. BOSTICK, LIEUTENANT GENERAL, COMMANDING GENERAL AND CHIEF OF ENGINEERS

ESTEVAN R. LÓPEZ, COMMISSIONER, BUREAU OF RECLAMATION, DEPARTMENT OF THE INTERIOR

ACCOMPANIED BY TOM ISEMAN, DEPUTY ASSISTANT SECRETARY, WATER AND SCIENCE

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. Good afternoon. The Subcommittee on Energy and Water Development will please come to order.

Today's hearing will review the President's fiscal year 2017 budget request for the U.S. Army Corps of Engineers and the Bureau of Reclamation, which is part of the Department of Interior. This is the subcommittee's second budget hearing this year, and we will have two more budget hearings in the coming weeks.

Now, we are going to change our procedure just a little bit, but it will not hurt to have a little more relaxed and informal hearing. We have four votes on the Senate floor that are scheduled to begin now, and I will give my opening remarks, and then will turn to Senator Feinstein for her remarks. Once Senator Feinstein and I have given our opening statements, we will take a brief recess to allow Senators to vote and come back, or if a Senator is here, we will just continue the hearing, alternating in between Senator Feinstein as Chairman of the Committee.

To allow Senators enough time to ask their questions, I am going to ask each Senator to withhold their opening remarks, and I ask unanimous consent that any written statements Senators would like to submit be included in the hearing record.

Our witnesses' written testimony, which we have, will also be included in the hearing record, and I would ask you to withhold your opening statements. And then as soon as Senators arrive, we will recognize them one by one for their 5 minutes of questions and conversations. And if there is anything in your opening statement that you would like to say when you answer questions, there will be plenty of time to say that.

So basically during these votes, which are going to last about an hour and a half, we will have alternating Senators. But I hope we can continue to have our hearing all the way through the end—to the end. Several Senators had expressed an interest in coming today, and I know for certain that Senator Feinstein will be here.

Our witnesses today include Jo-Ellen Darcy, the Assistant Secretary of the Army for Civil Works. Ms. Darcy has been serving as the Assistant Secretary since 2009, and she has told me this may be her last budget hearing before this committee. I want to thank her for her many years of public service. I have enjoyed working with her both publicly and the visits we have had in our offices, and including her time working on the Senate Environment and Public Works Committee. So thank you, Secretary Darcy, for being here today.

[The statement follows:]

PREPARED STATEMENT OF HON. JO-ELLEN DARCY

Thank you Chairman Alexander and distinguished members of the subcommittee for the opportunity to present the President's Budget for the Civil Works program of the Army Corps of Engineers for fiscal year 2017. We are pleased to have an opportunity to further expand on the Administration's priorities and goals. Those priorities include promoting resilient communities to address current and future impacts of climate change and sea level rise; fostering and maintaining strong partnerships with local communities; and practicing sustainability and sound stewardship across all our missions. I also want to take this opportunity to touch on points that this Committee has raised in the past.

This year's Civil Works Budget reflects the Administration's priorities through targeted investments in the Nation's water resources infrastructure that will reduce flood risk to communities; facilitate commercial navigation; and restore degraded aquatic ecosystems.

The 2017 Civil Works Budget provides $4.62 billion in discretionary appropriations for the Army Civil Works program, focusing on investments that will yield high economic and environmental returns or address a significant risk to safety.

The Budget focuses on funding our three major mission areas:

—42 percent of funding is allocated to commercial navigation,

—26 percent to flood and storm damage reduction, and

—8 percent to aquatic ecosystem restoration.

Other practical, effective, sound investments include allocating $196 million of the Budget to hydropower, $200 million to regulatory activities, and $103 million to the clean-up of sites contaminated during the early years of the Nation's nuclear weapons program.

The Civil Works program, which this Budget supports, relies on the strong relationships between the Corps and local communities; these strong relationships allow us to work together to meet their water resources needs across all of our missions, as well as to address broader water resources challenges that are of concern at the national or regional level.

The Budget supports a Civil Works program that has a diverse set of tools and approaches to working with local communities, whether this means funding studies and projects with our cost-sharing partners, or providing planning assistance and technical expertise to help communities make better-informed decisions.

PLANNING MODERNIZATION

The Budget supports the continued implementation of Corps efforts to modernize its planning process. The Budget provides funding in the Investigations account for 49 feasibility studies, and funds 12 of them to completion.

The Budget reflects full implementation of the SMART (Specific, Measurable, Attainable, Risk Informed, Timely) planning initiative, under which each feasibility study is to have a scope, cost, and schedule that have been agreed upon by the District, Division, and Corps Headquarters. The Budget supports efficient funding of these studies.

Studies generally are funded with the presumption that they will complete in 3 years and for $3 million ($1.5 million Federal). In the first year, the Corps will work to identify the problem, develop an array of alternatives, and begin the initial formulation. The bulk of the study costs are anticipated to be incurred during year two, as the alternatives are narrowed down and a Tentatively Selected Plan is identified, which requires more detailed feasibility analysis and formulation. During the third year, the focus is on completing the detailed feasibility analysis, State and agency review, and finalizing the Chief's Report. There are some exceptions to this funding stream, such as where an increase in the study cost or an extension in the study schedule is appropriate based on factors such technical complexity, public controversy, the need for more detailed work to address a specific issue, or the overall cost of a proposed solution.

Over the past 3 years, the Corps began 29 new studies and resumed 10 studies. The fiscal year 2017 Budget focuses on managing these and other ongoing studies and bringing them to a conclusion. It includes funding for 14 studies and three preconstruction engineering and design efforts previously funded only through the annual Corps work plans. Among the studies budgeted for the first time this year are two of the feasibility studies that were recommended as focus areas in the North Atlantic Coast Comprehensive Study, nine studies that are starting in fiscal year 2016, and three disposition studies under the Disposition of Completed Projects remaining item.

The Water Resources Priorities Study is one of the 10 studies started in the fiscal year 2016 work plan. This study will address the critical need to develop a baseline assessment of the Nation's vulnerability to flood damages on both a national and regional scale. First, a baseline assessment will identify and analyze the key drivers of flood risks, including the ways in which some of those risks are changing or expected to change over time. The study will then examine the effectiveness of existing Federal, State, and local programs, and develop recommendations to improve these programs to reduce the economic and life safety risk associated with large-scale flood and storm events in ways that will also promote the long-term sustainability of communities and ecosystems.

The Budget also helps to further combat the spread of invasive species by its proposals for funding work associated with the Great Lakes and Mississippi River Interbasin Study (GLMRIS). The Budget supports efforts to reduce the risk of interbasin transfer of aquatic nuisance species through the Chicago Area Waterway System (CAWS) in the vicinity of Brandon Road Lock and Dam. The Brandon Road effort will assess the viability of establishing a single point to control the one-way, upstream transfer of aquatic nuisance species from the Mississippi River basin into the Great Lakes basin near the Brandon Road Lock and Dam located in Joliet, Illinois. The Budget includes funding to continue this effort.

Among the 12 feasibility studies funded to completion is the Mississippi River Hydrodynamic Model—Delta Management Study under the Louisiana Coastal Area Ecosystem Restoration Program. This greater than $25 million study effort will identify options to address the long-term sustainability of the lower Mississippi River Deltaic Plain and provide a model to assess the effects on navigation and sediment dynamics along the Mississippi River main stem associated with combinations of Mississippi River diversions.

Investigation funds are also provided to continue to support State and local flood risk mitigation priorities through the "Silver Jackets" program. The Corps currently supports participation on "Silver Jackets" team in 44 States and the District of Columbia through which technical assistance activities are being implemented that support State and local community flood risk and floodplain management priorities.

CONSTRUCTION

The Budget for the construction program includes funds to complete six construction projects, continue 27 ongoing projects, and start one new project. The one new construction project, Mud Mountain Dam in Washington State, involves construction of a fish passage facility to address a Biological Opinion.

Flood and Storm Damage Reduction

The Budget includes $404 million for flood and storm damage reduction projects and remaining items, and funds the American River Watershed (Folsom Dam Modification), CA project and the Topeka, KS project to completion.

Over the last several years, Congress has funded the dam safety program at a lower level than the Budget, based on revisions of capabilities that the Corps has provided to Congress subsequent to the Budget submission. These revisions—often but not always showing a lower capability than requested in the Budget—are caused by a variety of factors, including savings from contract awards, process efficiencies, and changed conditions. The Budget includes $239 million (not including $21 million for the Dam Safety remaining item) for the dam safety program that, when coupled with anticipated unobligated carryover balances on these important projects, will ensure that each of the Dam Safety Action Classification (DSAC) I and DSAC II projects funded in the Budget is able to progress efficiently and effectively to implement a risk reduction strategy for these structures.

Coastal Navigation

The Budget includes $105 million for coastal navigation and remaining items and funds the Oakland Harbor, CA (50-foot Deepening) project and the Delaware River Deepening, NJ, PA, & DE project to completion. The Savannah Harbor Expansion Project, GA project is funded at $42.7 million, which is over a 100 percent increase from the fiscal year 2016 Budget. The Columbia River at the Mouth, OR & WA project is funded at a level that will enable efficient progress toward mitigating the life safety risk that is presented by the deteriorated jetties.

Inland Navigation

The Budget funds inland waterways construction and remaining items at $246 million, of which $33.75 million will be financed through the Inland Waterways Trust Fund (IWTF) for the Olmsted Locks and Dams, IL & KY project, which at $225 million is funded at the highest amount ever budgeted for this project. With the passage of the Water Resources Reform and Development Act of 2014 (WRRDA 2014), the Olmsted Locks and Dam, Ohio River, Illinois and Kentucky project is now cost-shared 85 percent General funds and 15 percent IWTF. This change reduced the cost of this project to the navigation users by around $500 million, and increased the amount that Federal taxpayers will have to pay by an equivalent amount. In the ABLE Act, the Congress also increased the tax on diesel fuel used in commercial transportation on certain of the inland waterways. As a result of both of these changes, over the next few years there will be somewhat more money in the IWTF to support the user-financed share of inland waterways capital investments.

The Administration—as it has in recent years—will propose legislation to reform the way that we finance capital investments for navigation on the inland waterways. The Administration's proposal includes a new user fee to produce additional revenue to help finance long-term future investments in these waterways to support economic growth. We would like to work with the Congress to enact this legislation.

The Corps is also finalizing a Capital Investment Strategy for the inland waterways. The Corps has coordinated this effort with stakeholders and the Inland Waterways Users Board to provide an opportunity for their input. The process will include an estimate of the investment need over the next 20 years and objective nationwide criteria to provide a framework for deciding which capital investments should have priority for funding from a national perspective. While this Strategy will provide a benchmark, it is a conceptual plan and does not take the place of normal Budget processes or commit the Government to future actions.

Aquatic Ecosystem Restoration

The Corps continues to contribute to the Nation's efforts to restore degraded environments; to that end, the Budget for the Corps funds restoration of several large aquatic ecosystems that have been a focus of interagency collaboration, including the California Bay-Delta, the Chesapeake Bay, the Everglades, the Great Lakes, and the Gulf Coast. Other funded efforts include the Columbia River, and priority work in the Upper Mississippi and Missouri Rivers.

OPERATION AND MAINTENANCE

The Budget provides $2.705 billion for Operation and Maintenance, with $1.122 billion for operation and $1.414 billion for maintenance, and an additional $169 million for remaining items. This encompasses a wide range of activities, from operating and maintaining our locks and dams to monitoring the condition of dunes and berms that reduce the risk of flooding in a hurricane from wave action and storm

surges, running the Corps recreation facilities that are visited by millions of Americans each year, and helping us be responsible stewards of the lands associated with Corps projects and operate them in an increasingly sustainable fashion.

For example, the Budget helps us maintain and improve our efforts on sustainability. We are reducing the Corps' carbon footprint by:

—increasing renewable electricity consumption,

—reducing greenhouse gas emissions, and

—reducing non-tactical vehicle petroleum consumption.

We are also making important investments to promote the sustainable management of Corps-owned lands, waters and cultural resources. The Budget provides $9.6 million to update 24 Master Plans and initiate work on 26 others that govern how we manage our facilities, which will helps us make better decisions about how to use the land and keep it healthy; $12 million to address impacts from invasive plants and animals at Corps facilities; and $6.9 million for enhancements and protections for habitat in support of the National Strategy to Promote the Health of Honey Bees and other Pollinators.

The Budget also provides $35.5 million for the levee safety program, which will help ensure that Federal levees are safe and in line with the Federal Emergency Management Administration standards.

The overall condition of the inland waterways has continued to improve over the last few years. The number of lock closures due to preventable mechanical breakdowns and failures lasting longer than one day and lasting longer than one week has decreased significantly since fiscal year 2010. However, the lock closures that do occur result in additional costs to shippers, carriers, and users. That is why the Budget continues to provide a high level of funding to operate and maintain the inland waterways, with emphasis on those that together carry 90 percent of the commercial traffic.

Harbor Maintenance Trust Fund

The Budget provides $951 million from the Harbor Maintenance Trust Fund (HMTF) to maintain coastal channels and related work, which is the highest amount ever budgeted. This includes almost 11 percent for Great Lakes harbors, 10 percent for emerging harbors, $856 million from the O&M Account, $2 million from the Mississippi River & Tributaries account, and $65 million from the Construction account.

RESEARCH AND DEVELOPMENT

Research, Development, and Technology is a component of the Science and Technology portfolio of the Corps and continues to address key strategic technology needs to inform policy-making and business processes. The fiscal year 2017 Budget includes $18.1 million for research and development. This funding will be used to extend the service life of water resources infrastructure through research, use of novel materials, and technology transfer. The Research, Development, and Technology program enhances our capabilities to facilitate marine transportation, assist flood and coastal storm preparation and recovery efforts, restore aquatic ecosystems, pursue sustainable environmental management, and respond to changing environmental conditions.

REMAINING ITEMS

The Budget includes $276 million for remaining items, including $55 million in the Investigations account, $44 million in the Construction account, $169 million in the Operation and Maintenance account, and $8 million in the Mississippi River and Tributaries Account.

Annual funding for these remaining items is determined based on current needs, such as the increased focus on technical assistance to States and local communities to improve resilience to climate change.

REGULATORY PROGRAM

The Budget includes $200 million for the Regulatory program.

ALTERNATIVE FINANCING AND PUBLIC–PRIVATE PARTNERSHIPS

As part of looking to the future of the Army's Civil Works program, we continue to consider potential tools to expand and strengthen our already strong partnerships, especially in the area of Alternative Financing. As part of this effort, we are actively talking with potential non-Federal partners about their ideas for how we can work together and soliciting suggestions and best practices from others in the Federal Government with experience in this area.

Increasingly, some non-Federal sponsors have been contributing or advancing funds for work that is authorized to be funded at Federal expense. In such cases, the project beneficiaries assume more (or all) of the cost. Before entering into an agreement to accept such funds, the Corps carefully evaluates its overall workload to ensure that execution of the proposed work will not adversely affect our directly-funded programs, projects and activities.

VETERANS CURATION PROGRAM

Finally, this Budget provides $6.5 million for the Veterans Curation Program, which was started in 2009 with support from the American Recovery and Reinvestment Act. This program offers veterans the opportunity to learn tangible work skills and gain experience by rehabilitating and preserving federally owned or administered archaeological collections found at Corps projects.

Thank you all for attending today. General Bostick will provide further remarks on the Army Corps of Engineers 2017 Budget.

Senator ALEXANDER. Lieutenant General Thomas P. Bostick is the Chief of Engineers for the U.S. Army Corps of Engineers. He has been serving as Chief of Engineers since 2012. Time goes awfully fast. This will be his last hearing before this subcommittee I am told, and I want to thank General Bostick. He has been responsive and straightforward to me as well as to other Senators, and I am deeply grateful for his many years of service to our country.

[The statement follows:]

PREPARED STATEMENT OF LIEUTENANT GENERAL THOMAS P. BOSTICK

Mr. Chairman and Members of the Subcommittee:

I am honored to testify before your committee today, along with the Assistant Secretary of the Army for Civil Works, the Honorable Jo-Ellen Darcy, on the President's fiscal year 2017 Budget for the United States Army Corps of Engineers (Corps) Civil Works Program. This is my fourth and final time before this Subcommittee to testify on the Civil Works budget; thank you for your support in the past, and I look forward to continuing to work together during the remainder of my tenure as Chief of Engineers.

I have been in command of the Corps for nearly 4 years, and I want to briefly update you on the four Campaign Plan Goals for the Corps.

First, Support National Security. The Corps supports the National Security efforts of the United States. We continue working across the globe with presence in more than 110 countries, using our Civil Works, Military Missions, and Water Resources Research and Development expertise to support our Nation's Combatant Commanders. We are proud to serve this great Nation and our fellow citizens, and we are proud of the work the Corps does to support America's foreign policy. Civilian Army Corps employees from across the Nation have volunteered—and continue to volunteer—to work, in a civilian capacity, to provide critical support to our military missions abroad and humanitarian support to the citizens of those nations. Many of these volunteers have served on multiple deployments.

Second, Transform Civil Works. The four elements of the Civil Works Transformation strategy will make the Corps more efficient and effective while continuing to support the Nation by addressing some of our greatest infrastructure needs. Civil Works Transformation focuses on modernizing the project planning process; enhancing the budget development process through a more streamlined process and the use of a systems approach, to identify and deliver more holistic outcomes to the Nation; evaluating the portfolio of existing water resources projects to support risk-informed investment decisions, identify priorities, and develop better solutions to water resources problems; and improving methods of delivery to produce and deliver quality products and services.

Since the inception of Civil Works Transformation efforts in 2008, 58 Chief's reports have been completed, with 45 Chief's Reports completed in the last 4 years alone; we are learning and continue to become more efficient in our processes.

Third, we must continue to be proactive and develop better strategies to Reduce Disaster Risks, as well as respond to natural disasters when they do occur, under the National Response Framework, National Disaster Recovery Framework, Public Law 84–99 as amended, and Corps project authorities for flood risk management. I continue to be amazed at the work the Army Corps does in this arena. For example, the Corps provided technical expertise to the State of South Carolina during

its historic flooding last year by assisting in inspecting over 600 locally owned dams to assess dam safety vulnerability. More recently, the Corps teamed with local communities and State-led Army National Guard units during the Mississippi River floodfight to help impacted communities in the flood's aftermath. Additionally, I am pleased to report to you that all of the Federal flood risk reduction systems along the Mississippi performed as designed, demonstrating the effectiveness of the investments made.

Fourth, Prepare for Tomorrow. This is about our people—ensuring we have a pipeline of the best Science, Technology, Engineering and Mathematics personnel, as well as strong Workforce Development and Talent Management programs. Efforts to tailor development programs to employee aspirations is helping to maximize talent retention and is instilling a career of service culture. We take seriously the importance of engaging and retaining our talented workforce and have significantly improved our agency ranking in the Federal Employee Viewpoint Survey over the past year, on the list of best places to work in the Federal Government. Equally important is helping the Nation's Wounded Warriors and transition out of active duty to find fulfilling careers. Last year, we set a goal to assist 150 transitioning Wounded Warriors. I am proud that we achieved more than double that goal. We assisted over 300 Wounded Warriors in finding permanent positions within the Corps and other organizations. Over the past 3 years, we have helped 631 Wounded Warriors find meaningful careers.

We are equally focused on Research and Development efforts to help solve a host of the toughest challenges facing the Army and the Nation. Our Civil Works Program research and development efforts provide the Nation with innovative engineering products, some of which can have applications in both civil and military infrastructure spheres. By creating products that improve the efficiency of the Nation's engineering and construction industry, and through providing more cost-effective ways to operate and maintain public infrastructure, Civil Works program research and development contributes directly to the national economy.

SUMMARY OF FISCAL YEAR 2017 BUDGET

The fiscal year 2017 Civil Works Budget is a performance-based budget, and reflects a focus on the work that will provide the highest net economic and environmental returns on the Nation's investment or address a significant risk to safety. Investments by the Civil Works program will reduce the risks of flood impacts in communities throughout the Nation, facilitate comercial navigation, restore and protect significant aquatic ecosystems, generate low-cost renewable hydropower, and support American jobs. Continued investment in critical Civil Works infrastructure projects is an investment in the Nation's economy, security, and quality of life—now and in the future.

The Budget focuses on high-performing projects and programs within the three main water resources missions of the Corps: commercial navigation, flood and storm damage reduction, and aquatic ecosystem restoration. The fiscal year 2017 Budget includes $4.62 billion in gross discretionary funding for Civil Works activities throughout the Nation, including the construction of water resources projects that will provide high economic, environmental and public safety returns on the Nation's investment.

The Budget also proposes the necessary level of funding for the Regulatory program to protect and preserve water-related resources of the Nation.

INVESTIGATIONS PROGRAM

The fiscal year 2017 Budget provides $85 million in the Investigations account, and $7 million in the Mississippi River and Tributaries account to evaluate and design projects within the Corps three main mission areas, with emphasis on those that are potentially the most promising on a performance basis; and for related work, including some research and development. The Budget also supports the Corps planning and technical assistance programs, including using its expertise to help local communities increase their resilience to, and preparedness for, flood risks such as the flood risks in coastal communities associated with hurricanes and sea-level rise.

CONSTRUCTION PROGRAM

The Budget provides $1.09 billion for the construction program in the Construction account, and $64 million in the Mississippi River and Tributaries account, prioritizing projects with the greatest net economic and environmental returns per dollar invested, as well as projects that address a significant risk to safety. The Budget includes funds for one high-priority construction new start: Mud Mountain

Dam, Washington. In keeping with our Civil Works transformation strategy, the Budget provides construction funding to complete six projects, and deliver their benefits to the Nation.

The goal of the construction program is to produce as much value as possible for the Nation from the available funds. The Corps uses objective performance measures to allocate this funding. For projects that are being funded primarily due to their economic return, these include benefit-to-cost ratios. For projects funded on the basis of their environmental return, priority is given to those projects that are highly effective at restoring degraded structures, functions or processes of significant aquatic ecosystems on a cost-effective basis. The selection process also prioritizes dam safety assurance, seepage control, static instability correction projects, and those that address a significant risk to safety.

OPERATION AND MAINTENANCE (O&M) PROGRAM

All structures age and, over time can deteriorate, causing a potential decline in reliability. With proper maintenance and periodic rehabilitation, however, we can extend the effective life of most of the facilities owned or operated by, or on behalf of, the Corps for many years. As stewards of this infrastructure, we are working to ensure that key features continue to provide appropriate levels of service to the American people.

The Corps is working to improve the efficiency and effectiveness of its operation and maintenance program. The Budget focuses on investments that address infrastructure maintenance needs on a risk assessment basis. In fiscal year 2017, the Corps will further expand the implementation of a modern asset management program, dedicating an increased amount of its O&M funding to the key features of its infrastructure and for work that will reduce long-term O&M costs in real terms. The Budget also supports an energy sustainability program and pursues efficiencies in the acquisition and operation of our information technology.

The Budget for the operation and maintenance program provides $2.705 billion in the O&M account, and $151 million in the Mississippi River and Tributaries account, with a focus on the operation and maintenance of key commercial navigation, flood risk management, hydropower and other facilities. The Budget gives priority to coastal ports and inland waterways with high levels of commercial traffic, and includes $951 million for work financed through the Harbor Maintenance Trust Fund. The Budget also funds some small ports, with emphasis on those that support significant commercial fishing, subsistence, or public transportation benefits. The Budget provides O&M funding for safety improvements at Federal dams and levees based on the risk and consequence of a failure. According to our analyses, 297 of the 709 dams in our current inventory have required some form of modification or interim risk reduction measure, or may require them over the next 50 years, if they are to continue to serve their authorized purposes. Many interim risk reduction measures have been implemented already and additional measures are considered and evaluated as new and existing issues are identified.

Generally, the O&M program supports completed works owned or operated by the Corps, including administrative buildings and laboratories. Work to be accomplished includes: operation of locks and dams along the inland waterways; dredging of inland and coastal Federal channels; operating multi-purpose dams and reservoirs for flood risk reduction, hydropower, recreation, and related purposes; maintenance and repair of facilities; monitoring of completed projects; and general management of Corps facilities and the land associated with these purposes including work to serve as a responsible steward of the resources on Corps lands.

The fiscal year 2017 Budget provides $194 million in the O&M account for hydropower activities in order to maintain basic power components such as generators, turbines, transformers and circuit breakers at Corps hydropower facilities to keep them operating efficiently and effectively. The Corps is the largest hydropower producer in the U.S., operating 24 percent of the Nation's hydropower capacity.

REIMBURSABLE PROGRAM

Through the Interagency and International Services (IIS) Reimbursable Program, the Civil Works program assists other Federal agencies, State, local, Tribal governments, and those of other countries with timely, cost-effective solutions to support their programs. These agencies can turn to the Corps, which already has these capabilities, rather than develop their own internal workforce and expertise to oversee project design and construction. Such intergovernmental cooperation is effective for agencies and the taxpayer, and uses the skills and talents that we bring from our Civil Works and Military Missions programs. The work is principally technical oversight and management of engineering, environmental, and construction projects—

the work itself is typically performed by private sector firms—is financed by the agencies we service. IIS Reimbursable Program activities in support of our domestic stakeholders totaled $657 million in fiscal year 2015. We only accept agency requests that are consistent with our core technical expertise, in the national interest, and that can be executed without impacting our primary mission areas.

EMERGENCY MANAGEMENT

The fiscal year 2017 Budget provides $30 million in funding for the Flood Control and Coastal Emergencies account to enable the Corps to prepare for emergency operations in response to natural disasters. The Budget for the emergency management program also includes $4.5 million for the National Emergency Preparedness Program.

An additional $3 million is included in the Investigations account for the Corps participation in the development and expansion of intergovernmental teams, known as Silver Jackets, which collaboratively reduce the risks associated with flooding and other natural hazards. The Silver Jackets program is an innovative program, which provides a national forum to address State and local flood risk management priorities. Each team is developed at the State level. The teams share lessons learned at the State level with each other, and each team works to apply the available Federal and State resources effectively to meet its State's flood risk management priorities. There are now 45 active teams (44 States and the District of Columbia); our goal is to have a Silver Jackets team for every State. The flooplain management program of the Corps complements this effort by providing technical assistance.

CONCLUSION

The fiscal year 2017 Budget represents a continuing, fiscally prudent investment in the Nation's water resources infrastructure and restoration of its aquatic ecosystems. The U.S. Army Corps of Engineers is committed to a performance-based Civil Works Program, based on innovative, resilient, and sustainable risk-informed solutions.

Thank you, Mr. Chairman and Members of Subcommittee. This concludes my statement. I look forward to answering any questions you or other Members of the Subcommittee may have.

Senator ALEXANDER. Estevan López is Commissioner of the Bureau of Reclamation. As far as I know, he is not going anywhere right now.

[The statement follows:]

PREPARED STATEMENT OF ESTEVAN LÓPEZ

Thank you Chairman Alexander, Ranking Member Feinstein, and members of this Subcommittee for the opportunity to discuss with you the President's fiscal year 2017 Budget for the Bureau of Reclamation. I appreciate the time and consideration this Subcommittee gives to reviewing and understanding Reclamation's budget, projects, and programs and I look forward to working with the Committee in the future as Reclamation continues to address water issues in the West. Reclamation is committed to prioritizing and implementing its overall program in a manner that serves the best interest of the American public.

The Budget sustains our efforts to deliver water and generate hydropower, consistent with applicable Federal and State law, in an environmentally responsible and cost-efficient manner. It also supports the Administration's and Department of the Interior's (Department) priorities to ensure healthy watersheds and sustainable, secure water supplies; build a landscape-level understanding of our resources; celebrate and enhance America's great outdoors; power our future; strengthen Tribal nations; and engage the next generation.

The extreme and prolonged drought facing the western States affects major U.S. river basins throughout the West. Exceptional drought in many western States, specifically California, Nevada, Washington, and Oregon, affects households across the country because of the adverse impact on agricultural production. Drought is estimated to cost the Nation billions of dollars and impact thousands of jobs. In California alone, the estimated cost of the 2015 drought on agriculture—crop production, livestock, and dairies—is $2.7 billion with a total loss of 21,000 seasonal and part-time jobs. The effects of the current drought on California's Sacramento and San Joaquin River Basins, its water, its agricultural economy, and its communities are particularly acute. The Colorado River Basin—crucial for seven States and several

Tribes, in addition to two countries—is also enduring historic drought. Nearly 40 million people rely on the Colorado River and its tributaries for some, if not all, of their municipal needs. The Basin is experiencing the worst drought in recorded history; the period from 2000 through 2015 was the driest 16-year period in more than 100 years of record keeping. In 2015, Lake Mead, behind the Hoover Dam on the Colorado River, has declined to its lowest elevation since the 1930's. Snowpack, which functions as reservoir storage for many western basins, is diminishing.

Water year 2016 is shaping up to be influenced by the periodic "El Nino" anomaly associated with warmer ocean temperatures in portions of the Pacific, a phenomenon that generally leads to a wetter than normal year in areas of the western U.S., including California. However, one wet year alone will not alleviate the impacts of the multi-year drought. This water year exists against the backdrop of long-term sustained climatic change; both short-term and long-term droughts are expected to intensify. Although Reclamation continues to emphasize strategic priorities and operational activities to understand, and effectively adapt to, the risks and impacts of a changing environment on western water management, groundwater must be replenished before runoff can fill rivers and reservoirs, and the hydrologic system as a whole will need time to recover. As one of the Nation's primary suppliers and protectors of water, Reclamation needs to continue to plan and prepare for the next drought and its successors, despite cautious optimism in 2016.

This Budget addresses Reclamation's priorities by allocating funds based on objective and performance-based criteria to most effectively implement its management responsibilities for water and power infrastructure in the West. Reclamation's goals and priorities—including water supply reliability and power generation, climate variability adaptation, water conservation, aging infrastructure, sound science to support critical decisionmaking, and ecosystem restoration— were balanced in the formulation of the fiscal year 2017 budget. Reclamation continues to look at ways to more efficiently plan for the future challenges confronting water resources management, and to improve the way it does business.

In order to meet Reclamation's mission goals, we are building a landscape-level understanding of our resources and the protection and restoration of the aquatic and riparian environments influenced by our operations. This budget is focused on meeting National priorities for Indian water rights settlements, ecosystem restoration, and healthy watersheds and sustainable, secure water supplies. Further details of these efforts will now be discussed.

WATER AND RELATED RESOURCES

The fiscal year 2017 Budget for Water and Related Resources, Reclamation's principal operating account, is $813.4 million, a reduction of $305.6 million from 2016 enacted. This reflects the budgetary shift of $106.2 million from this account to establish a separate Indian Water Rights Settlement Account, and $36.0 million to establish a separate discretionary account within the San Joaquin River Restoration Fund.

The Budget includes a total of $383.5 million at the project and program level for water, energy, land, fish and wildlife resource management, and development activities. This provides for planning, construction, water sustainability activities, management of Reclamation lands, including recreation areas, and actions to address the impacts of Reclamation projects on fish and wildlife.

The Budget also provides a total of $429.9 million at the project level for water and power facility operations, maintenance, and rehabilitation activities. Reclamation emphasizes safe, efficient, economic, and reliable operation of facilities, ensuring systems and safety measures are in place to protect the facilities and the public. Providing adequate funding for these activities continues to be one of our highest priorities.

HIGHLIGHTS OF THE FISCAL YEAR 2017 BUDGET FOR WATER AND RELATED RESOURCES

I would like to share with the Committee several highlights of Reclamation projects and programs within the Administration's Budget. The Budget continues to promote and support efficient water management, increased renewable energy production, the construction of new infrastructure and sound maintenance of existing facilities, restoration of aquatic environments, and the continued use of applied science and new technologies to help safeguard sustainable water deliveries and energy production. As a result, Reclamation continues to play an important role in providing a strong foundation for economic activity across the American West.

WaterSMART Program.—One method Reclamation employs to stretch water supplies in the West and prepare for these ongoing challenges is the WaterSMART (Sustain and Manage America's Resources for Tomorrow) Program. The programs

included in WaterSMART are collaborative in nature and work to effectively achieve sustainable water management. WaterSMART Grants, Title XVI Water Reclamation and Reuse, and the Water Conservation Field Services Program, along with other Reclamation activities, support the Department's Priority Goal for Water Conservation. The Basin Studies component of WaterSMART supports the Department's priority goal Ensuring Healthy Watersheds and Sustainable, Secure Supplies.

In the fiscal year 2017 Budget, the Administration proposes to fund WaterSMART at $61.5 million. The WaterSMART components include: WaterSMART Grants funded at $23.4 million; the Basin Study Program funded at $5.2 million; the Title XVI Water Reclamation and Reuse Program funded at $21.5 million; Water Conservation Field Services Program, funded at $4.2 million; the Cooperative Watershed Management Program, funded at $1.8 million; the Drought Response program, funded at $4.0 million; and the Resilient Infrastructure program, funded at $1.5 million.

Rural Water Projects.—Congress specifically authorized Reclamation to undertake the design and construction of six projects intended to deliver potable water supplies to specific rural communities and Tribes located primarily in Montana, New Mexico, North Dakota, and South Dakota. The fiscal year 2017 Reclamation budget includes $38.1 million for rural water projects; $18.6 million of that total is for operation and maintenance of completed tribal systems, while the remaining $19.5 million is for continued construction for authorized projects.

Dam Safety Program.—A total of $86.1 million is provided for Reclamation's Safety of Dams Program, which includes $64.5 million to correct identified safety issues. Funding also includes $20.3 million for safety evaluations of existing dams and $1.3 million to oversee the Interior Department's Safety of Dams Program.

Site Security.—A total of $26.2 million is provided for Site Security to ensure the safety and security of the public, Reclamation's employees, and key facilities. This funding includes $4.1 million for physical security upgrades at high risk critical assets and $22.1 million to continue all aspects of Bureau-wide security efforts, including law enforcement, risk and threat analysis, personnel security, information security, risk assessments and security-related studies, and guards and patrols.

Powering Our Future.—The Budget includes $1.3 million to support Reclamation's Sustainable Energy Strategy and actions identified through the Sustainable Hydropower MOU with our partners at the Department of Energy (DOE) and U.S. Army Corps of Engineers. This funding will provide for increased hydropower development at existing Reclamation facilities, and will allow Reclamation to work with Tribes to assist them in developing renewable energy sources. These important projects will assist in the production of cleaner, more efficient energy and will support the Renewable Energy Resource Development Priority Goal.

Strengthening Tribal Nations.—The fiscal year 2017 Reclamation budget supports the Strengthening Tribal Nations initiative through a number of activities and projects. For example, the budget includes $10.4 million for Reclamation's Native American Affairs Program in support of Reclamation activities with Tribes, including technical assistance, Indian Water Rights Settlement negotiations, implementation of enacted settlements, and outreach to Tribes; and $15.7 million to continue the operation and maintenance associated with the delivery of up to 85,000 acre-feet of water to the Ak-Chin Indian Community in Arizona. Ongoing authorized rural water projects also benefit both tribal and non-tribal communities. Projects in the fiscal year 2017 Budget benefiting Tribes include the rural water component of the Pick-Sloan Missouri Basin Program, Garrison Diversion Unit; Fort Peck Reservation/Dry Prairie; and Rocky Boy's/North Central Montana; and operation and maintenance funding only for tribal features of the Mni Wiconi Project following completion of construction. Numerous other projects and programs, such as the Columbia/Snake River Salmon Recovery Program, Klamath Project, and the Yakima River Basin Water Enhancement Project also benefit Tribes. In fiscal year 2017, $106.2 million for planning and construction of three recent Indian Water Rights Settlements is being proposed in a new separate account as described below.

River Restoration.—To meet Reclamation's mission goals of securing America's energy resources and managing water in a sustainable manner for the 21st century, our programs also focus on the protection and restoration of the aquatic and riparian environments influenced by our operations. Ecosystem restoration involves many activities, including Reclamation's Endangered Species Act recovery programs, which directly address the environmental aspects of the Reclamation mission. In fiscal year 2017, a total of $135.5 million in the Budget for Reclamation projects and programs directly supports the goals of the America's Great Outdoors Program, through local and basin-wide collaboration in watershed partnerships. Several of the programs are described below.

The Budget has $27.3 million for Endangered Species Act Recovery Implementation programs within the Bureau of Reclamation, including $19.9 million in the

Great Plains Region to implement the Platte River Endangered Species Recovery Implementation program. Within California's Central Valley Project, $11.8 million is for the Trinity River Restoration Program, with an additional $1.5 million from the Central Valley Project Restoration Fund.

Many other projects and programs also contribute to ecosystem restoration including the Lower Colorado River Multi-species Conservation Program, Middle Rio Grande Endangered Species Act Collaborative Program, the Columbia/Snake River Salmon Recovery Program, and the Yakima River Basin Water Enhancement Project.

Research and Development.—Reclamation continues to promote research and development to advance the science and technology that supports best management of the country's natural resources and heritage. In fiscal year 2017 the research and development (R&D) budget totals $28.6 million, with $22.8 million for Science and Technology and $5.8 million for the Desalination and Water Purification Research Program. Scientific discovery, technological breakthroughs, and innovation are the primary engines for expanding the frontiers of human knowledge, which are vital for responding to the challenges and opportunities of the 21st century. Scientific and engineering innovation promotes sustainable economic growth and job creation, moves us toward a clean energy future, and helps us manage competing demands on environmental resources.

Desalination and water purification research strives to produce new clean water technologies, reduce costs, and decrease environmental impacts while converting unusable waters into viable water supplies. Reclamation's budget for these efforts also supports the Administration's science and technology priorities, including sponsorship of technology prize competitions, to spur innovative breakthroughs and research related to climate adaptation and clean energy.

In addition to the highlights just discussed, the fiscal year 2017 Water and Related Resources budget provides $110.8 million to operate, manage, and improve California's Central Valley Project; this amount reflects the shift of $36.0 million for a separate discretionary account within the San Joaquin River Restoration Fund, as discussed below. The next three accounts are also related to California water and restoration.

SAN JOAQUIN RIVER RESTORATION FUND

Reclamation proposes $36.0 million of current funds for the San Joaquin River Restoration Fund account in fiscal year 2017. The fiscal year 2017 Budget funds activities consistent with the settlement of Natural Resources Defense Council v. Rodgers as authorized by the San Joaquin River Restoration Settlement Act. The Act includes a provision to establish the San Joaquin River Restoration Fund to implement the provisions of the Settlement. The Settlement's two primary goals are to restore and maintain fish populations, and restore and avoid adverse impacts to water supplies. Under the Settlement, the legislation provides for nearly $2.0 million in annual appropriations from the Central Valley Project Restoration Fund for this purpose.

CENTRAL VALLEY PROJECT RESTORATION FUND

The fiscal year 2017 Budget includes a total of $55.6 million for the Central Valley Project Restoration Fund (CVPRF). This amount is determined on the basis of a 3-year rolling average not to exceed $50.0 million per year and indexed to 1992 price levels. These expenditures are offset by collections estimated at $55.6 million from mitigation and restoration charges authorized by the Central Valley Project Improvement Act.

CALIFORNIA BAY-DELTA RESTORATION

The fiscal year 2017 Budget provides $36.0 million for California Bay-Delta Restoration. The account focuses on the health of the Bay-Delta ecosystem and improving water management and supplies. The Budget will support the coequal goals of environmental restoration and improved water supply reliability, under the following program activities including: $2.2 million for a Renewed Federal State Partnership, $5.3 million for Smarter Water Supply and Use, and $28.5 million for Habitat Restoration. These program activities are based on the Interim Federal Action Plan for the California Bay-Delta issued December 22, 2009.

INDIAN WATER RIGHTS SETTLEMENTS

In fiscal year 2017, Reclamation will enhance support of Tribal nations. The fiscal year 2017 Budget proposes $106.2 million for Indian Water Rights Settlements

(IWRS), in a new account of the same name. Reclamation is proposing establishment of an Indian Water Rights Settlements account to assure continuity in the construction of the authorized projects, and to highlight and enhance transparency in handling these funds. This account is proposed to cover expenses associated with Indian water rights settlements contained in the Claims Resolution Act of 2010 (Public Law 111–291) and the Navajo-Gallup Water Supply Project within Title X of the Omnibus Public Land Management Act of 2009 (Public Law 111–11).

Of this amount, $6.4 million is for the Aamodt Settlement (Pueblos of Nambe, Pojoaque, Tesuque and San Ildefonso in New Mexico); $12.8 million for the Crow Settlement (Crow Tribe in Montana); $87.0 million for the Navajo-Gallup Settlement (Navajo Nation in New Mexico). These settlements will provide permanent water supplies and offer economic security for the Tribes and pueblos described above. The agreements will build and improve reservation water systems, rehabilitate irrigation projects, construct a regional multi-pueblo water system, and codify water- sharing arrangements between Indian and neighboring communities.

Per the Claims Resolution Act of 2010, in addition to the discretionary funding included in this Budget, additional mandatory funds have already been made available to Reclamation, in order to realize the deadlines mandated in the settlement acts. The White Mountain Apache Tribe activities will continue in fiscal year 2017 using mandatory funds.

POLICY AND ADMINISTRATION

The fiscal year 2017 Budget for Policy and Administration, the account that finances Reclamation's central and regional management functions is $59.0 million. The account supports activities necessary for the management and administration of Reclamation that are not chargeable directly to a specific project or program, such as corporate oversight, policy and overall program management, budget preparation, finance and procurement, and management of safety and health, human resources, and information technology.

PERMANENT APPROPRIATIONS

The total permanent appropriation of $106.8 million in fiscal year 2017 primarily includes $103.6 million for the Colorado River Dam Fund. Revenues from the sale of Boulder Canyon power are placed in this fund and are available without further appropriation to pay for operation and maintenance of the project and other costs.

2016 THROUGH 2017 PRIORITY GOALS

Priority goals are a key element of the President's agenda for building a high-performing government. The priority goals demonstrate that our programs are a high value to the public and they reflect achievement of key Departmental milestones. These goals focus attention on initiatives for change that have significant performance outcomes, which can be clearly evaluated, and are quantifiable and measurable in a timely manner. Reclamation's participation in the Water Conservation and Supply Enhancement, Renewable Energy Resource Development, Climate Change Adaptation, and Engaging the Next Generation priority goals helps to achieve these objectives.

Water Conservation and Supply Enhancement.—The fiscal year 2017 Budget will enable Reclamation to achieve water conservation capability for agricultural, municipal, industrial, and environmental uses in the western United States by 1,040,000 acre-feet/year cumulatively (since 2009) through September 30, 2017. This will be accomplished through the use of the WaterSMART Program to assist communities in stretching water supplies while improving water management and increasing the efficient use of water. By the end of fiscal year 2015, Reclamation had already exceeded the prior goal of 975,000 acre-feet through partnerships with States, Tribes, irrigation and water districts and other organizations with water or power delivery authority.

Renewable Energy Resource Development.—The Budget also supports efforts to increase approved capacity authorized for renewable energy resources affecting Department of the Interior managed lands to at least 16,600 Megawatts (since 2009) by September 30, 2017. Reclamation contributes to the Departmental goal primarily through the Memorandum of Understanding (MOU) on Hydropower with the Departments of Interior, Energy, and the U.S. Army Corps of Engineers (USACE), signed March 24, 2010. The MOU encourages the development of sustainable hydropower at Federal facilities in order to help meet the Nation's needs for reliable, affordable, and environmentally sustainable hydropower by prioritizing goals and coordinating hydropower research and development efforts through studies and assessments. The Budget includes $1.3 million for Reclamation to implement an auto-

mated data collection and archival system to aid in hydropower benchmarking, performance testing, and strategic decisionmaking.

Climate Change Adaptation.—Consistent with the direction in the President's 2013 Climate Action Plan, Reclamation is developing and implementing approaches to understand, and effectively adapt to, the risks and impacts of a changing environment on western water management. Some examples include:

—The Basin Study Program takes a coordinated approach to assess risks and impacts; develop landscape-level science; communicate information and science to other entities and agencies; and work closely with stakeholders to develop adaptation strategies to cope with water supply and demand imbalances in a collaborative manner.

—The Drought Response Program will implement a comprehensive new approach to drought planning and will implement actions to help communities manage drought and develop long-term resilience strategies.

—Through the Resilient Infrastructure Program, Reclamation will proactively maintain and improve existing infrastructure for system reliability, safety, and efficiency for water conservation to prepare for extremes and to support healthy and resilient watersheds. Reclamation will continue to develop, implement, and test an enhanced decisionmaking criteria framework for selecting resilient infrastructure investments and will identify opportunities to integrate operational efficiencies more compatible with climate variability adaptation goals, as part of the Bureau's ongoing infrastructure investments.

—Reclamation's Science and Technology Program conducts water resources research to improve capability for managing water resources under multiple stressors, including a changing climate. This research agenda will collaborate with and leverage the capabilities of the Interior Climate Science Centers.

Reclamation's WaterSMART Grants, Water Conservation Field Services, and Title XVI Programs are enabling the West to better adapt to the impacts of a changing environment by helping to conserve tens of thousands of acre-feet of water each year in urban and rural settings, on both large and small scales.

Engaging the Next Generation.—By September 30, 2017, the Department of the Interior will provide 100,000 work and training opportunities over four fiscal years, 2014 through 2017, for individuals ages 15 to 35 to support the Department's mission. In fiscal year 2017, Reclamation will continue to provide work and training opportunities by leveraging funding through agreements with 21st Century Conservation Service Corps partners. Reclamation will continue to use the Public Land Corps Act authority and the Youth Conservation Corps Act to enter into partnership agreements. These agreements will be used to assist on-the-ground projects and internships involving youth in cooperative efforts in cultural and natural resource conservation related to Reclamation projects. In addition, a partnership agreement with the National Fish and Wildlife Foundation will help provide additional youth conservation employment opportunities.

President's Build America Investment Initiative.—To help advance the goals and priorities of the Department, a new Center for Natural Resources Investment was recently launched by the Department as part of the President's Build America Investment Initiative. Reclamation fully supports this activity, as the new center will promote increased private investment in water infrastructure and facilitate locally-led water exchange agreements in the western United States to increase resilience of water supplies and drive additional investment in conservation technologies.

Appropriations/Authorization Language Proposals.—The Administration is proposing two significant changes in authorizations, for which language is included in the fiscal year 2017 Budget. The first is to extend the California Federal Bay-Delta Authorization Act, as amended, from 2017 through 2018, so the CALFED program can continue its mission—even more important given the current drought. Language is also included to increase the authorized appropriations ceiling of Section 9504(e) of the Secure Water Act of 2009 from $350 million to $400 million to provide the appropriations ceiling needed for much of the funding for Reclamation's WaterSMART program, one of our most effective programs.

CONCLUSION

Importantly, the fiscal year 2017 Budget demonstrates Reclamation's commitment to addressing the water and power demands of the West in a fiscally responsible manner. This Budget continues Reclamation's emphasis on managing, operating, and maintaining its public infrastructure and delivering water and power in an environmentally and economically sound manner, in the interest of the American public. Reclamation is committed to working with its customers, States, Tribes, and

other stakeholders to find ways to balance and support the mix of water resource demands in fiscal year 2017 and beyond.

This completes my statement. I would be happy to answer any questions.

Senator ALEXANDER. And Tom Iseman, Deputy Assistant Secretary for Water and Science at the Department of Interior, is also here.

[The statement follows:]

PREPARED STATEMENT OF THOMAS ISEMAN

Chairman Alexander, Ranking Member Feinstein, and members of the Subcommittee, I am Tom Iseman, Interior's Deputy Assistant Secretary for Water and Science, and I appreciate the opportunity to talk with you about the water related programs of the Department of the Interior, and the President's 2017 Budget. My office oversees the Bureau of Reclamation and U.S. Geological Survey activities.

This is a strong budget that builds on our accomplishments. Our request enables us to carry out our important missions—maintain our core capabilities, meet commitments, and invest in key priorities. The investments in this request show the Administration remains focused on meeting the Nation's greatest challenges looking forward and ensuring our economy works for all.

Our budget is part of the President's broader strategy to make critical investments in domestic and national security priorities while adhering to the bipartisan budget agreement signed into law last fall, and lifts sequestration in future years to continue investment in the future. This Budget recognizes the importance of the programs of Reclamation and the USGS to the overall strength of the Nation's economy, and its infrastructure. To put this into perspective, the U.S. Department of the Interior Economic Report for fiscal year 2014 States, Interior-managed lands and activities contributed about $360 billion in national economic output, supporting an estimated two million jobs. Of this, Reclamation's contribution, including recreation activities, was $48.4 billion, supporting over 360,000 jobs.

At the same time, the Department of the Interior's 2017 proposed investments lay the groundwork for promoting renewable energy development, wise water utilization, managing the Nation's lands responsibly, helping to protect communities in the face of climate change, and investing in science to inform natural resource management. This request addresses significant resource challenges for the Nation, including water availability, particularly in the arid West, and makes important investments in America's water infrastructure.

Interior's 2017 budget includes $1.0 billion for research and development activities throughout the Department, an increase of $84.5 million from the 2016 enacted level. Activities supported include scientific analysis of natural systems and applied field research to address specific problems, such as thawing permafrost, invasive species, and flooding. With multiple science programs across the Department's bureaus and offices, science coordination remains a critical component in the process of effective science application. Interior is well served by the deployment of science advisors in each bureau. These advisors serve critical roles within the organizations and across the Department by sharing information application. The Interior 2017 budget reflects high priority needs identified for scientific research across the Department, which is the foundation for the $28.6 million requested for research and development for Reclamation. This request supports the Administration's efforts to collaborate with non-Federal partners on advanced water treatment and clean water technologies while conserving scarce Western water and protecting species habitat.

THE 2017 BUDGET ADVANCES A RECORD OF ACHIEVEMENT

This budget builds on a record of achievement across Interior's diverse mission in general, as well as within Reclamation's specific mission. To support the Powering Our Future Initiative, the 2017 Reclamation budget includes $1.3 million to implement an automated data collection and archival system to aid in hydropower benchmarking, performance testing, and strategic decisionmaking; investigate Reclamation's capability to integrate large amounts of renewable resources such as wind and solar into the electric grid; and work with Tribes to assist in developing renewable energy sources. These important projects will assist in the production of cleaner, more efficient renewable energy.

In addition, the 2017 budget sustains President Obama's strong commitment to tribal self- determination, strengthening tribal nations, and investing in the future of Native youth, as illustrated by Reclamation's continuing investment in endangered species recovery, rural water, and water rights settlement programs. In fact,

the Department's overall budget continues to address Indian water rights settlement commitments and programs to support Tribes in resolving water rights claims, developing water sharing agreements, and supporting sustainable water management.

Interior continues to engage in innovative efforts to leverage youth engagement and partnerships to advance the Department's extraordinary mission, and Reclamation is a contributor to this effort.

Bureau of Reclamation projects funded from 2010 through 2015 exceeded the cumulative water savings target of 910,000 acre-feet of water/year, achieving savings of over 970,000 acre-feet, roughly the amount of water needed for household use in Phoenix and the surrounding area each year. The budget keeps Reclamation on track to conserve 1,040,000 acre-feet by the end of fiscal year 2017.

PROMOTES THE CONSERVATION AND PROTECTION OF AMERICA'S NATURAL AND CULTURAL RESOURCES

America's public lands and waters offer space to get outside and get active, and provide living classrooms with hands-on opportunities to build skills. The Administration launched the Every Kid in a Park Initiative to inspire the next generation to discover all America's public lands and waters have to offer. Starting with the 2015–2016 school year, all fourth grade students and their families are able to receive free admission to all national parks and other Federal lands for a full year. Reclamation's mission goals of securing America's energy resources and managing water in a sustainable manner for the 21st Century demands a focus on the protection and restoration of the aquatic and riparian environments influenced by its operations. Ecosystem restoration involves many activities, including Reclamation's Endangered Species Act recovery programs, which directly address the environmental aspects of Reclamation's mission. In 2017, a total of $135.5 million in Reclamation's budget directly supports the goals of America's Great Outdoors Initiatives, through local and basin-wide collaboration in watershed partnerships. This supports efforts to manage and promote the health and resilience of ecosystems on a landscape scale, including a continued focus in priority landscapes such as the California Bay-Delta.

IMPLEMENTS THE PRESIDENT'S CLIMATE ACTION PLAN

As manager of roughly 20 percent of the land area of the United States and a partner with tribal, Federal, State, local, and territorial government land managers, the Interior Department works to address the challenges of natural hazards brought on by a changing climate as an integral part of its mission. The budget includes funding to improve the resilience of communities and ecosystems to changing stressors, including flooding, severe storm events, and drought as part of the Administration's effort to better understand and prepare for the impacts of a changing climate.

Healthy communities require secure, sustainable water supplies. This is particularly challenging with record drought conditions and increasing demand taxing watersheds throughout the country, especially in the arid West. To help increase the security and sustainability of Western watersheds, the budget continues investment in the Department's WaterSMART program to promote water reuse, recycling, and conservation, in partnership with States, Tribes, and other partners. Funding is also included for research, development, and challenge competitions to find longer term solutions through new water technologies. The budget invests in the Nation's water infrastructure to ensure millions of customers receive the water and power that are the foundation of a healthy economy.

IMPROVES OVERSIGHT AND USE OF FEDERAL DOLLARS

Interior has several multi-year efforts underway to reduce its nationwide facilities footprint, and improve the efficiency and effectiveness of its information technology infrastructure and financial reporting capabilities. Funding for these specific efforts is included in the Department's budget request. Reclamation is participating in these efficiency endeavors, as well as improving reporting and increasing data quality and transparency, as envisioned in the DATA Act. Reclamation is also implementing the Federal Information Technology Acquisition Reform Act, to improve standardization of information technology investments by strengthening the role of the Department's Chief Information Officer in strategic planning, budget formulation and execution, and acquisition of information management and technology activities.

NATURAL RESOURCE INVESTMENT CENTER

The Department has established a Natural Resource Investment Center to spur partnerships with the private sector to develop creative financing opportunities that support economic development goals while advancing the Department's resource stewardship mission.

The Center will use market-based tools and innovative public-private collaborations to increase investment in water conservation and critical water infrastructure, as well as promote investments that conserve important habitat in a manner that advances efficient permitting and meaningful landscape-level conservation. The Center will work closely with the private sector and others to identify innovative ideas and financing options for projects that conserve scarce Western water resources and protect species habitat.

RECLAMATION HIGHLIGHTS

The 2017 budget for Reclamation and the Central Utah Project Completion Act (CUPCA) totals $1.1 billion and focuses on investments in Indian water rights settlements, ecosystem restoration, healthy watersheds and sustainable, secure water supplies.

Funding for Water and Related Resources shows a reduction of $305.6 million from 2016, reflecting the shift of $106.2 million to the requested new Indian Water Rights Settlements account and $36.0 million for a separate discretionary account within the San Joaquin River Restoration Fund.

Reclamation requests establishment of an Indian Water Rights Settlements account in 2017 to assure continuity in the construction of the authorized projects and to highlight and enhance transparency in handling these funds. The budget includes $12.8 million to implement the Crow Tribe Rights Settlement Act, $6.4 million for the Aamodt Litigation Settlement Act, and $87.0 million for the Navajo-Gallup Water Supply Project.

The extreme and prolonged drought facing the western States affects major U.S. river basins in virtually every western State. The effects of the current drought on California water, its agrarian economy, and its communities are particularly acute. According to the Economic Analysis of the 2015 Drought for California Agriculture by California Department of Food and Agriculture, University of California-Davis and California Department of Water Resources, the estimated cost of the 2015 drought on California agriculture-crop production, livestock, and dairies is $2.7 billion with a total loss of 21,000 seasonal and part-time jobs. The Colorado River Basin— crucial for seven States and several Tribes, in addition to two countries— is also enduring historic drought. Nearly 40 million people rely on the Colorado River and its tributaries for some, if not all, of their municipal needs. The Basin is experiencing the worst drought in recorded history; the period of 2000–2015 was the driest 16-year period in more than 100 years of record keeping.

WATERSMART, WATER CONSERVATION FIELD SERVICES AND TITLE XVI PROGRAMS

Reclamation's WaterSMART program, requested at $61.5 million, is helping to address the drought and other water supply issues across the West. WaterSMART Grants, Water Conservation Field Services, and Title XVI Programs, along with other Reclamation activities are enabling the West to better adapt to the impacts of a changing environment by helping to conserve tens of thousands of acre-feet of water each year in urban and rural settings, and on both large and small scales. The Drought Response Program will implement a comprehensive new approach to drought planning and will implement actions to help communities manage drought and develop long-term resilience strategies. Reclamation continues to promote research and development through its Science and Technology and Desalination and Water Purification Research Programs to produce new clean water technologies, reduce costs, and decrease environmental impacts while converting unusable water into viable water supplies. The 2017 budget includes $8.5 million for an X-Prize competition to encourage innovative water purification and treatment technologies.

WaterSMART enables the USGS and Reclamation to make focused and leveraged investments to address water resource challenges. The USGS budget provides an increase of $18.4 million for science to support sustainable water management, nearly doubling the investment made in 2016. As climate models forecast increasingly frequent and more intense droughts, improving water management science is a paramount concern for land and water management agencies, States, local governments, and Tribes. The USGS budget would improve water use information and research, provide grants to State water resource agencies, and create hydrologic models and databases for better decision support. The USGS budget also includes $3.9 million

for drought science and $4.0 million to develop methods to assess regional and national water use trends during drought.

CENTRAL UTAH PROJECT COMPLETION ACT

The Central Utah Project Completion Act, or CUPCA, Office is a Department of the Interior program that reports directly to the Office of Water and Science. The fiscal year 2017 Budget proposes $5.6 million, a reduction of $4.4 million from 2016 enacted, and includes $1.3 million to be transferred to the Utah Reclamation Mitigation and Conservation Commission. The 2017 reduction in construction funding is the result of difficult choices necessitated by the constrained fiscal environment. The Budget provides funding through the CUPCA office to continue the partnership with the Central Utah Water Conservancy District in completing the Spanish Fork Canyon-Provo Reservoir Pipeline (Northern Pipeline) of the Utah Lake System delivering 30,000 acre-feet of water to Salt Lake County; required program oversight activities; and endangered species recovery program implementation.

CONCLUSION

Thank you for the opportunity to testify on the President's 2017 budget request for the Bureau of Reclamation and CUPCA. This budget is responsible, and proposes to maintain core capabilities with targeted investments to advance water conservation and the stewardship of water resources. I thank you again for your continued support of our mission. I look forward to answering questions about this budget. This concludes my statement.

Senator ALEXANDER. As I said, we are here today to review the President's fiscal year 2017 budget request for the Corps of Engineers and the Bureau of Reclamation, and I am going to focus my questions on three main areas. Number one, making investments in our Nation's water infrastructure a priority. We have made some real progress there in the last few years. Properly maintaining our inland waterway system. We have also made progress there. And deepening and widening our coastal harbors. We have made progress there, and I would like to keep making that progress.

Number one, in my opinion we should be spending more, not less, on our Nation's water infrastructure. Last year, Congress made record investments in our water infrastructure by providing nearly $6 billion to the Corps of Engineers, the largest amount of funding for the Corps in a regular appropriations bill. Instead of building on that investment, however, the President's budget request this year proposes to cut funding for the Corps of Engineers to $4.620 billion, which is $1.4 billion, or a 23 percent, cut below fiscal year 2016.

This is an enormous step backwards. In fact, if we simply approve the President's request, the Corps of Engineers would receive less than what Congress appropriated in fiscal year 2006, setting us back more than a decade. And if we look at the condition of the locks and dams that the Corps operates across the country, for example, we should be able to see exactly why these investments are needed.

The National Academy of Sciences in 2011 said that the Corps has 138 locks in operation that are over 50 years old, and that the average age of our locks is 58 years. These locks are critically important to jobs. They ought to be among our highest priorities in Federal spending and support. Using locks is the only way for inland waterway shippers to move things like grain, steel, fertilizer, and coal up and down rivers. And having to unexpectedly shut them down for extended periods of time could be catastrophic for agriculture and other commodities that rely on them to get their goods to the market.

Yet as these facilities age, major upgrades, maintenance, sometimes replacement is required, so I think it is fair to ask why would the President cut funding for the Corps of Engineers at a time when more investment is needed? I believe President Obama should make funding our Nation's waterways a priority, but this year's budget request certainly does not reflect that, and I am going to ask our witnesses why that is the case.

PROPERLY FUNDING OUR INLAND WATERWAY SYSTEM

The President's budget request proposes significant cuts to our 12,000-mile inland waterway system. Critical projects, such as replacing Chickamauga Lock in Tennessee, have been piling up for years due to a lack of funding, and many of us in Congress have recognized that we needed to take steps to increase funding for the Corps of Engineers to address this backlog.

First, Congress passed a law that reduced the amount of money that comes from the Inland Waterways Trust Fund to replace Olmsted Lock, a project in Illinois and Kentucky that was soaking up almost all the money that is available for inland waterway projects. Second, Congress worked with the commercial waterways industry to establish a priority list for projects that needed to be funded on which Chickamauga ranks near the top in fourth place.

And third, 2 years ago, working together in a bipartisan way, we increased the user fee that commercial barge owners asked to pay in order to provide more money to replace locks and dams across the country, including Chickamauga Lock. These user fees are deposited into the Inland Waterways Trust Fund. These steps increased the amount of funding that was available for inland waterway projects from about $85 million—at least the amount of money from the trust funds that was available from $85 million in 2014 to now $106 million this year.

Overall, these changes permitted us to spend over $400 million on our locks and inland waterways when they were matched with funds from the General Treasury. Yet the President's budget request only proposes to spend $34 million instead of $106 million from the Inland Waterways Trust Fund, leaving about 75 percent of the available funds unspent. That means, in effect, that we would be collecting taxes from commercial barges to go through the locks in order to improve the locks, and then we would be keeping the money, putting it in the bank, and not spending it for the intended—for the intended reason.

The budget request also proposes to fund a single project, Olmsted Lock, and eliminates funding for three other projects that received funding last year, Monongahela Kentucky Locks and Chickamauga Lock. Replacing Chickamauga Lock is important to all of Tennessee, and if Chickamauga Lock closes, it will throw 150,000 more trucks onto I–75, yet the Administration continues to not include it in the budget. I have worked with Secretary Darcy and General Bostick, and I thank them for this, over the past few years with the money that we have appropriated here in the Congress. And I deeply appreciate the fact that we found a way to restart construction on Chickamauga Lock, which has now been funded for two consecutive years.

But this budget proposal is a huge step backwards in this area, and I will be asking witnesses today why the Administration has not proposed to spend all the funds that have been collected, especially since commercial barge owners asked Congress to increase user fees they pay to improve our inland waterway infrastructure. We hear about unhappy Americans today in this election season. I would think one reason they would be unhappy if we raise their taxes at their request to improve the locks, and then took the money and did not spend it for the reason that we said we were raising the taxes.

DEEPENING AND WIDENING OUR COASTAL HARBORS

The budget request also fails to make critical investments in our Nation's harbors. To maintain our economic competitiveness, our harbors need to be able to accept the larger ships that are expected to come through the Panama Canal. Significant work and funding is necessary to deepen and widen our coastal harbors to accommodate these bigger ships, yet the Administration's budget proposes major cuts for this program as well.

To ensure that these critical investments are made to our harbors, Congress enacted spending targets for the Harbor Maintenance Trust Fund in the 2014 Water Resources Reform and Development Act. The target for fiscal year 2017 is about $1.18 billion, yet the Administration only proposes to spend $986 million, a shortfall of $194 million.

Now, we are talking about harbors that need work badly—Mobile, Charleston, Savannah, New York, Jacksonville. These are important to the future of our country. For 2 years, we have in Congress done what we said we would do and matched our targets for these critical investments. Yet the Administration would knock us back by about $200 million this year. So I will ask our witnesses how they plan to make these important upgrades to our harbors without requesting sufficient resources to do it.

BUREAU OF RECLAMATION

I would also like to recognize our witnesses from the Department of Interior and Bureau of Reclamation. The Bureau of Reclamation delivers water to one of five farmers in the West, irrigating more than 10 million acres of some of the most productive agricultural land in the country. We have a farmer from the West on our committee. My guess is that he will probably have some questions in this area. Although Reclamation does not manage water resources in Tennessee, I know of its deep importance to Senator Feinstein and other Senators on this subcommittee, and we look forward to hearing your testimony.

Now, Senator Feinstein is not here, and what I think we will do is, Senator Tester, because of the votes today, what we—have you voted already? So what we decided to do was to go ahead and try to make the hearing a movable feast here, and they are going to submit their questions for the record, and Senators will have a chance to ask questions as they come in. If Senator Feinstein arrives, she will make her opening statement and ask her questions. If she does not before I leave, then I will turn to you and let you—if I may do that, and let you take questions.

INLAND WATERWAYS

Let me start with a few questions, and then I will go—then I will go vote. Ms. Darcy, we worked well together to improve funding for inland waterways, but this budget is a big disappointment. Can you explain why the Corps' proposed budget does not seem to reflect the President's statements that we should be investing more in our Nation's infrastructure?

Ms. DARCY. Senator Alexander, given the fiscal realities that we are facing, the President's overall budget for the Army Civil Works Program is what is affordable at this time given all the other competing requirements for the budget, including even deficit reduction. So at this time, it is what is affordable for us to be able to move forward with inland waterways as well as others in the overall President's budget.

Senator ALEXANDER. But we collected money from the commercial users of the locks. I mean, it is one of those unusual circumstances where the barge owners came and said would you please raise our taxes and use those taxes to improve the locks and the waterways. And so, we have done that, and you cooperated with that last year very well, and that permitted us to match the user fee money with appropriations and have more than $400 million.

Yet this year if we take the President's budget, we would only have about $225 million, and we would be leaving $72 million in taxes that we collected unspent. What should I say to those commercial barge owners who paid extra taxes so we would use it to improve the locks when we not use it?

Ms. DARCY. Senator, as you know, with any funding coming out of the Inland Waterways Trust Fund, which is collected from the taxes, there has to be a match from the General Treasury from our budget, a 50/50 match for everything within the Inland Waterways Trust Fund. In the 2017 budget, the President funded Olmsted Lock and Dam at $33.5 million out of the Trust Fund, because there was a change made in the law year before last that the cost share for Olmsted would not be 50/50. It would be 15 percent from the Trust Fund and 85 percent from the General Treasury.

In order to meet that match, the remaining money in the Trust Fund could not be matched for the other projects. In 2017, we are funding Olmsted Lock's capability, and then in the coming years, as you say, there is an unexpended balance in the Trust Fund. I think it will be $106 million.

But over time, when we are buying down and completing Olmsted, which we expect to have completed in 2018, we will be able to free up other monies and match them with the Trust Fund in the out-years for other projects on the capital strategies list for inland waterways.

Senator ALEXANDER. Let me stop my questioning just for a moment. Senator Cochran, have you already voted?

Senator COCHRAN. Yes and no.

Senator ALEXANDER. So you have to go over and vote?

We have got about three minutes left I think in the voting. Would you like to make your opening statement before we go vote?

Senator COCHRAN. I have to go vote.

Senator ALEXANDER. Okay. Well then, why don't we do this. Why don't you and I go vote, and then we will come back, and then I will recognize you. And, Senator Tester, would you assume control of the committee here?

Senator TESTER. That is a dangerous thing.

Senator ALEXANDER. I know, but I trust you.

Senator TESTER. I will do it.

Senator ALEXANDER. And when Senator Feinstein comes, if you could hand over the gavel to her?

Senator TESTER. I would be more than happy to do that. I will hold the fort down while you are gone doing your job.

Senator ALEXANDER. Thank you.

Senator TESTER [presiding]. Thank you. Thank you all for being here. I appreciate your work. And thank you, Mr. Chairman, for the flexibility.

RURAL WATER PROJECTS

I am going to be starting with you, Commissioner López. I believe we have got a half a dozen major rural water projects that are in progress, that are being constructed. I think the request this year is $19.5 million for construction on those six projects. I think it is probably north of $1 and a half billion if we are going to complete them all right now, and that might be pretty conservative, quite frankly.

Montana has two of them that are pushing between $250 and $300 million each, give or take a few million dollars, and the request is for $19.5 million. Now in past years we plussed that account up, I think $47 million last year and $31 million the year before that. I guess I do not know how the Department is doing its budget, but is it—are we coming in at such a low number just assuming we are going to bump it up, and then you can look fiscally conservative, and we do not look so fiscally conservative? What is the thought process behind that, because $19.5 million is not even close to keeping up with the rate of inflation.

Mr. LÓPEZ. Good afternoon, Senator, and thank you for your question. My answer is very similar to Secretary Darcy's earlier remarks, working within the fiscal constraints that we are. Much of our infrastructure is quite old, 50 to 100 years old. So the vast majority of our funds go towards the continuing O&M and upkeep of that existing infrastructure. We try and maximize the amount that remains for this construction of new projects. Unfortunately, it is a very small remainder.

Senator TESTER. Yeah, I would guess. And one of the problems is that, you know, we are probably—I hope we plus this up again. But if you came asking for a few more bucks, we might be able to get more than just what we are going to plus it up by, because, I mean, the need here is for $100 million, not $19.5 million, and I think you agree with that. It could easily be used when you get these water projects done, move onto the next piece of infrastructure, and be done with it. Is there a long-term plan as far as—or a short-term plan—I do not care, either one—within the Agency to complete these projects?

Mr. LÓPEZ. Within the current budget constraints, we are doing what we can. We do thank Congress for the plus up. It certainly has helped us get moving along, but it has been inadequate.

Senator TESTER. So what you are saying is that as long as we are under these budget constraints, they will continue to—these projects will continue to flounder for dollars.

Mr. LÓPEZ. Senator, unfortunately we have to maintain our existing infrastructure and make sure that that continues to function.

Senator TESTER. Okay. Well, there was a proposal out there that my predecessor, Max Baucus, I believe, put forth about taking a funding stream out of the Reclamation Fund. Is that something that you think is appropriate? Is that something you would support?

Mr. LÓPEZ. Senator, obviously I would have to coordinate with the Administration as to an Administration position. However, I think your idea was the original intent of that Reclamation Fund——

Senator TESTER. Yes, it is.

Mr. LÓPEZ [continuing]. To plow back into investment and infrastructure. It seems like that would be a wise use of some of that money.

Senator TESTER. I will take that as an endorsement. Thank you.

Mr. LÓPEZ. I think it was.

IRRIGATION WATER

Senator TESTER. Assistant Secretary Darcy, my guess is at this point in time in your life, you would like to see the term "intake dam" go away. It has been—I am going to tell you from my perspective it has been—I do not know if we would go as far as calling it a nightmare, but it has not gone smoothly, let us just put it that way. There is active litigation currently on this project. I do not want you to get into those details.

But could you comment on what you are doing to make sure that the irrigators have access to irrigation water that they would normally get from intake? I think it is about 52,000 acres.

Ms. DARCY. We are trying to maintain existing operations. However, as you know, building the intake structure is currently under litigation, and we are forbidden from going forward with construction. But we have let a construction contract, so we would be ready to go if and when the litigation is resolved.

Senator TESTER. So do you anticipate that litigation is going to be solved by this month?

Ms. DARCY. I would not say this month, Senator.

Senator TESTER. Oh, okay.

Ms. DARCY. I would like to say this fall.

Senator TESTER. Okay. Well, that is instructive. Here is the problem. Are these folks going to have water this season? I do not know what they are planning, but they could be putting in the ground at the end of this month, like I say, depending on what the crop is. It could be in April. It could be in May. It could be in June. That is long before fall. Are they going to have water this year?

Ms. DARCY. I would have to say I do not know.

Senator TESTER. Whoa.

Ms. DARCY. General Bostick? I do not know.

Senator TESTER. That is not the right answer.

Ms. DARCY. I know.

Senator TESTER. Can somebody else shed some light on it?

General BOSTICK. A lot of our effort to move forward is going to depend on the completion of the EIS, and that EIS is not going to be completed until the fall. But once that is completed, then we can move forward with the construction.

Senator TESTER. I gotcha.

General BOSTICK. Beyond that, it would be difficult for us to commit. I know the water is needed earlier than that, but it would be difficult to do without the court ruling to move forward.

Senator TESTER. So by fall, just so you know, I mean, you guys—I hope you know this. By fall, the growing season is over. So is there anything we can do? Talk to me, please.

General BOSTICK. I think we can continue to work to accelerate it as much as we can.

Senator TESTER. So that you know, I do not know what crop insurance does in cases like this for these guys. I do not know if they can easily convert back to a dry land system. I doubt it. I do not know if Mother Nature will smile upon them this year so they will not need as much water. But we could—without irrigation water, we really—I mean, these guys could be—literally lose the farm. And I do not know their operations, but I do know that if it was my operation and I was counting on irrigated yield to pay my bills and I got dry land yield, it would be very difficult to maintain that operation. So——

Mr. LÓPEZ. Senator, if I may.

Senator TESTER. Sure, go ahead.

Mr. LÓPEZ. If I may address that just a little bit. We are working with the Lower Yellowstone Board of Control to seek an extension of a permit that would allow the continued rock piling of that diversion weir to try and get water this season. Obviously it is not certain that we will be totally successful, but we are going to do everything that we can to make sure that the farmers get some water.

Senator TESTER. You know what. Thank you. I mean, that is all I can ask for, you do everything you can do to make sure those folks get their water, and they will get their water. I appreciate that.

I feel bad not to—not having more questions for you because I have got time, and usually this never happens, okay.

WATER INFRASTRUCTURE IMPROVEMENTS

I guess what I will say is that I appreciate what you are doing, and I do appreciate the work everybody at this table and their priorities for the fiscal year. I think the issue when it comes to infrastructure is it is expensive, and it is needed. You talked about 50 to 100, and probably east of Mississippi it is 150 years old some of that water infrastructure. And it is in dire need of rebuild or replace.

And in some cases in Montana it is in dire need of just getting water in places that do not have water. It is critically important if we are going to have any kind of economy. And so, hopefully through your work, and if you continue to lay out the case and be

honest with Congress about what the needs are and what your capacity is under the current budget restraints, we will get enough votes in this outfit to try to get some solid infrastructure improvements around this country. It is something that my parents' generation got. Unfortunately my generation does not, at least the ones that serve here in Washington, DC.

So thank you for your work, whether it is in recreation, or flood protection, or hydropower production, or irrigation for agriculture, or drinking water. I certainly appreciate what you do.

With that, I guess if I was in the military, I would say "at ease, smoke them if you got them." But we are in a building that you do not do that in, and I will wait for Senator Feinstein's arrival, and we will go from there.

Okay. We will recess until the Chair, or Vice Chair, or a member of this Committee shows, and then I can go vote. Thank you all.

[Recess.]

Senator ALEXANDER [presiding]. The committee hearing will resume. Thanks to the witnesses. I understand we exhausted Senator Tester.

He missed his opportunity of a lifetime, but he appreciated the chance to question you. I will proceed with some of my questions until another Senator arrives, particularly Senator Feinstein, Senator Cochran I know, and we will talk a little bit. And I will defer to them whenever they come or as other Senators come. We have three more votes, but still we should be able to give Senators an opportunity to have a good discussion.

CHICKAMAUGA LOCK

General Bostick, I want to go back Chickamauga Lock on which I have worked with you before. I generally do appreciate the work that you and Secretary Darcy have done in the past 2 years to restart Chickamauga Lock. I know you have looked at it carefully. You have stayed within your—within the established priorities within your Department. But you had sufficient funds to spend $3 million in 2015 of unallocated money, and then this past year the funding that Congress provided gave sufficient funds to do what you needed to do with the first three priorities on that priority list and left $29 million for work on the fiscal year 2016 work plan for Chickamauga Lock.

I am perplexed about why the Corps would want to restart a project and then not propose to fund it until it is finished. So let me ask you this. How much funding could Chickamauga Lock use during fiscal year 2017?

General BOSTICK. Senator, you are asking about the capabilities, and I thought I would first talk about how we look at the capability on a project.

Senator ALEXANDER. That would be fine.

General BOSTICK. When we look at the civil works budget, it is a performance-based budget as we look at our projects. We look at each project based on what we can obligate each year, and that would be what we call the capability. It is also important to understand that when we look at capability, we identify the capability for each project without regard to the amount of money that we might have for the whole civil works budget. So if you added the

capability of every project, it would obviously be more than the capability that we could execute in a given year.

Given that, $37 million would be the capability of Chick Lock in fiscal year 2017.

Senator ALEXANDER. So, well, thank you for such a precise answer. So if you sufficiently funded the first three priorities on your list, then the question would be whether you had $37 million for Chickamauga Lock, which is fourth. Is that also correct?

General BOSTICK. If we sufficiently funded the first three projects, would we have——

Senator ALEXANDER. No. I guess the way you would be looking at it. Let us go back to this year. I think what you did this year, you looked at the first three priorities on your capital list and determined that you had a sufficient amount of money. What would the capability be for each of those.

General BOSTICK. Correct.

Senator ALEXANDER. You did that, and you had $29 million left, and you spent that on Chickamauga Lock. Is that basically right?

Ms. DARCY. Yes.

General BOSTICK. The $29 million, correct. That was out of the work plan.

Senator ALEXANDER. So in the next year it would be—$37 million would be the amount you could spend if you had it available.

General BOSTICK. $37 would be what we could obligate in fiscal year 2017.

Senator ALEXANDER. Thank you for your answer. I am now going to call on Senator Feinstein for her opening statement. I know that Senator Cochran, the committee's chairman is coming, hoping to—he was here earlier, hoping to make a statement. And we will continue until every Senator has a chance to do that, and we will go back and forth to voting. Senator Feinstein.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thank you very much, Mr. Chairman. And, first of all, let me give my apologies to you and to our witnesses as well as to the people that were here. As you know, I had an amendment on the floor and spoke on it, and at least am pleased that it passed unanimously. So that is the good news part of this.

I want to welcome our witnesses. I want to thank you for your testimony today. And, General Bostick, I understand you are retiring this year, so I want to extend my gratitude for your service to this country. It is very much appreciated.

General BOSTICK. Thank you.

Senator FEINSTEIN. You have served with distinction within the Army, both at home and abroad, and we are very proud of you. So thank you. And you have done work on behalf of California, which I thank you for.

Turning the President's 2017 budget request, Mr. Chairman, I have to say I am disappointed in the proposals from both agencies represented here today. A 23 percent drop in the Corps' budget and a 13 percent drop in Reclamation's budget is simply unacceptable when one considers all of the water resource needs our Nation faces. The work your agencies do to provide tangible benefits to

more people on a daily basis than perhaps anything else funded in our bill.

You are responsible for providing drinking water, water to produce food. You are tasked with protecting lives, homes, businesses from floods. You maintain navigation channels and ports. You restore the ecosystem to help combat climate change. So it is disappointing that every year we go through the same exercise of examining an Army Corps budget that has been cut by over $1 billion from the previous year's enactment level, and that is not your doing. It is the executive branch's doing.

It seems to me your job is already difficult enough, and I am not pleased to have to play these games with the Administration for yet another year. So I hope we can come to some agreement on numbers that allow you to do the job well.

I am equally disappointed with Reclamation's proposed budget, which is a 13 percent decrease from fiscal year 2016. The subcommittee has undertaken herculean efforts to provide $150 million more than was requested over the last 2 years to address the drought facing the West. And so, once again the Administration did not propose to continue that funding. That is $150 million that we put in that they did not continue, and indeed did not request any additional funding for the drought. That, as a Californian, is really unacceptable.

My constituents are also the President's constituents, and I am really frustrated that the Administration seems unwilling to help me do something about this drought. One El Nino year alone will not be enough to end this drought, and Californians are really hurting. It should matter.

It is a huge State, 40-plus million people. Sixty-nine communities in our State have significant water supplies and water quality issues. Our economy lost $42.7 billion from the drought last year. One million acres of California farmland was fallowed in 2015. The drought has led to 35,000 permanent jobs lost. Land subsidence from pumping too much groundwater has caused large areas of the San Joaquin Valley to sink by as much as two inches per month. As a result, bridges, aqueducts, and roads have already begun to crack.

Fifty million large trees are dead or likely will die. Another—and get this number—888 million trees experienced loss of canopy cover since 2011. And I said to my staff, Commissioner, this cannot be right, and they said, oh, yes, we have checked it, it is.

There are two themes I want to highlight today. The first is data versus intuition, and the second is win-win scenarios. Commissioner López, this subcommittee has provided the Bureau with extraordinary resources over the past 2 years to provide more water to people in the West. Yet I continue to hear that water pumping decisions are still being based on intuition of when protected fish might be near the pumps rather than when we know they are actually present.

For example, Interior may reduce pumping if even one smelt this size is found as far away as 17 miles from the pumps near a monitoring station called Prisoner's Point. But outside, biologists and scientists believe that Reclamation is reducing pumping prematurely. These experts believe that the Agencies could continue

with higher pumping levels, even if smelt are found at a monitoring station that is only 12 miles from the pumps. Why? Because they can still move back.

So we need to know who is right, and that is why I believe, and what we have proposed, is daily boat monitoring in turbid waters because that water is critical to making an informed decision and increasing the Agencies' operational flexibility. Reclamation has been given significant funds to make more data driven decisions grounded in the latest science, and so I hope you will do so.

Secretary Darcy, while water supply is not your primary mission, I believe that water supply can be achieved also during the course of the Corps' traditional work on flood protection, navigation, and ecosystem restoration. I believe there are numerous opportunities for the Corps to find these win-win scenarios, and you have done a good job, and I just want to encourage you to look for doing that.

For example, seismic retrofits could be coupled with dam raises, and we have that in one proposal of such in the San Joaquin Valley. Better weather forecasting resulting in less water being unnecessarily released from damns. I met with the Army Corps head from Sacramento yesterday about Folsom Dam. Folsom Dam is just 60 percent filled, and yet they are releasing water because of the possibility of rain, which could possibly produce flooding.

Now, I do not know if 60 percent is the right level to begin that—to do that or not, but I really think in view of the drought we ought to take a look at that. And ecosystem restoration projects can provide for additional groundwater recharge as well.

So, Mr. Chairman, let me say one thing. We have worked well together, and I have so appreciated your leadership over these many years. But this drought is the hardest thing I have ever done in my 23 years in the Senate. And I really want to make sure that the two agencies testifying today are working hand-in-hand with each other, with other Federal agencies, and with State and local partners. We are the most populous State in the Union, a significant source of our Nation's food, at least 50 percent. That means that drought is a problem for the whole Government and will require a whole of Government solution.

So, Mr. Chairman, what I am saying today is I look forward to working with you. You have always been a great one to work with, and I really appreciate it. And I hope that we will be able to reallocate some funds to solve some of these big problems. So thank you very much.

Senator ALEXANDER. Thank you, Senator Feinstein. We have had an excellent working relationship on this committee and with the witnesses. For the information of Senators, what we decided to do today, we dispensed with their testimony. That has been submitted to the record. We dispensed with opening statements except for the chair and the ranking member. And because of the votes we are giving Senators an opportunity to take their five minutes in terms of questions or statements in order.

And so, Senator Feinstein, if I may suggest, I am going to ask you to chair for the next few minutes, and I will go take the—I will vote early on vote three, and then I can get back here I think in time for you to go.

Senator FEINSTEIN. Good.

Senator ALEXANDER. And after you are through, if Senator Cochran comes back, he would be next. And if he is not, Senator Murkowski would.

Senator FEINSTEIN. Okay.

Senator ALEXANDER. So if you could please do your questions and then go to the next Republican member, I will be back by that time.

WATER PUMPING DECISIONS

Senator FEINSTEIN [presiding]. Thank you very much, Mr. Chairman.

My main question is on delta operations, and I am concerned that Reclamation has pumped less water in 2016 during this El Nino year than it did in 2015 when California was in extreme drought. Flows were as high as 50,000 CFS in the Sacramento River, yet the Agencies reduced pumping to the low end of the biological opinions because of one smelt.

I continue to hear that water pumping decisions are still being based on when protected fish might be near the pumps rather than when we know they actually are present. For example, Interior may reduce pumping even if one smelt is found as far as 17 miles away, as I have said, at Prisoner's Point. And I mentioned what outside biologists and scientists believe. I will not go into that again.

So here is the question. What are you doing to test whether or not smelt identified past the Prisoner's Point monitoring station can still survive and make their way back out to the central delta.

Mr. LÓPEZ. Senator, first of all, let me start by saying that I understand your frustration and that of the water users. We are equally frustrated. Having said that, I need to answer this by talking a little bit about what I understand the fish agencies are relying on.

And basically what they are concerned about is that once fish get to that point, Prisoner's Point and south of there, they are essentially entrained in the system. If they get into that area, they are not going to survive, nor are they going to spawn.

Senator FEINSTEIN. Excuse me. As long as we concur that Prisoner's Point is 17 miles from the pumps, right? That is all.

Mr. LÓPEZ. That is correct.

Senator FEINSTEIN. Please continue.

Mr. LÓPEZ. So we operate the pumps under the biological opinions, and the Fish and Wildlife Service regulate the conditions of the biological opinion of the smelt. They have a Smelt Working Group that is, in essence, the best minds on the issues of the smelt and its survivability.

They are of the opinion that once smelt get to that point around Prisoner's Point and points south, if the flow into the Old and Middle River is reversed, the smelt essentially moves on towards the pumps, they become entrained there, and they will not survive. So they are concerned about smelt even at a very long distance away from the pumps.

In fact, what has happened in recent timeframes of high flows, as you have mentioned, the Smelt Working Group has recommended even lower pumping rates than what we have done. But

David Murillo, our regional director of the Mid-Pacific, whom you know well, he and the fish agencies have a very good working relationship. They have agreed to essentially try something that is beyond what has been recommended, and that is what they have been doing.

One of the reasons that they are trying to prevent the entrainment is that we had an instance in the winter of 2012–2013 where the smelt did get entrained in that area. Once they got entrained, they got pulled into the pumps and we reached the take limit, and at that point we had to re-consult, and then we were even further constrained on pumping.

Senator FEINSTEIN. Let me ask you this question. Would you be willing to sit down with those biologists and agencies that believe that in the distance from 17 miles away and 12 miles away that those fish can still return, that they will not be entrained, would you at least sit down with them and listen?

Mr. LÓPEZ. Senator, absolutely, I would.

Senator FEINSTEIN. Okay. I will set it up.

Mr. LÓPEZ. However, I also want to mention that the entity that has to be convinced is the Fish and Wildlife Service and their biologists. They, in essence, regulate what we do.

Senator FEINSTEIN. We will include them, too.

Mr. LÓPEZ. Yes.

Senator FEINSTEIN. But, look, I do not intend to quit, so I am going to be at this, and there are so many conflicting opinions. Maybe if we get them in one room and listen to them, it might be profitable. So I very much appreciate that.

Senator Murkowski, welcome. You have a heavy load today I know.

KING COVE

Senator MURKOWSKI. We are all busy, and I apologize. We are all kind of jumping up and down like jack-in-the-boxes here to go vote because this is so important. I have what I hope will be three very quick questions.

The first one is relating to King Cove. Senator Feinstein indicates she is not giving up. I am not ever giving up on King Cove and getting my 10-mile—the people of King Cove a 10-mile, one-lane gravel non-commercial use road.

I am told, because I had the Secretary of Interior before me today in Interior Appropriations Subcommittee and last week in Energy, that the study that she asked the Corps to do about alternatives for King Cove was done by the Corps. When I asked her if she could make that public, she said she did not know if she could. She was going to have to check with the Corps. And I said, well, conveniently, I have got the Corps in front of me this afternoon, so I will ask if we will be able to get a copy of that report that was requested by the Secretary.

Ms. DARCY. Senator, I am——

Senator FEINSTEIN. Excuse me. Ms. Darcy, if you could wait. I will go down and vote, and you just continue on. Is that agreeable, Senator?

Senator MURKOWSKI. Thank you. Thank you.

Senator FEINSTEIN. Thank you.

Senator MURKOWSKI [presiding]. Thank you, Madam Chair.

Ms. DARCY. Senator, in response to your question, we did a report at the request at the Department of Interior for the non-road alternatives. And I will personally ask the Secretary of the Interior if we can make it public.

Senator MURKOWSKI. I would appreciate that. I think the people of King Cove would appreciate that, so I will look forward to that.

ARCTIC DEEP PORT STUDY

Let me ask you about the Port of Nome, and more specifically to a deepwater port in the Arctic. As you know, I have been a long proponent of making sure that we have infrastructure in the Arctic as we see developments taking place up north, and the increased traffic in the Bering, the Beaufort, and the Chukchi.

Last year, the Corps placed a strategic pause on the proposed port in Nome. When the President was up in September, he announced the need for a deepwater port that would be north of Dutch Harbor. Given the President's support for this, why have we not included construction funding going forward in this next fiscal year?

Ms. DARCY. Senator, the Arctic deep port study that you are referencing was indeed put on pause last October in conjunction with the local sponsor, the State of Alaska. Since that time and since the President's visit, we are now going to look at further scoping of that study, because it was limited to just some economics involving oil and gas. But there are other things that we think can be included in this, for instance, that the Port of Nome may be considered a port of national significance, in addition to the fact that it could possibly house the Coast Guard's icebreaker in the future, as well as other benefits that could come from that.

Senator MURKOWSKI. I appreciate the additional scoping, and I think that it is important that—life safety reasons. Like the socioeconomic benefit that accrues to a community, to a region when you have a port that is accessible that can reduce the cost of goods that come in, reduce the cost of fuel that comes in, just the general cost of living.

But I do find it just really quite surprising that the assessment for a port could have been built upon one project without recognition of, again, the expanded role, the activities in the region. This is one of those areas where when you talk to the people, whether they are in Nome or anywhere south of that, they say the Arctic is more than just oil and gas exploration.

It is just more than just shale up north. It is about having infrastructure to accommodate a reality, a daunting reality that—it is almost as if a new ocean has been discovered at the top of the globe. And so, how are we preparing for that? You cannot really be in the game, you cannot be that Arctic participant unless we have that system of ports. So know that we are going to continue to press on this.

SECTION 107 SMALL NAVIGATION PROGRAM

The last thing that I wanted to ask you, and I actually have constituents that are waiting to see me from the community of St. George on the Pribilof Islands. I had asked about the Section 107

Small Navigation Program last year. Many of my constituents have thanked me for advocating on behalf of that program because it really is a great fit, a great fit for these small villages, these small communities that are trying to construct a small harbor, break water. But the waiting between WRRDA (Water Resources Reform and Development Act) bills has been a little bit lengthy, and just these are projects, as you and I know, just compete on that national scale.

And what I would ask from you is just further commitment from you, from your staff to continue to work with my office so this Section 107 Program can continue to benefit these small communities. I know for a fact that the people of St. George that are waiting for me as I go to this next vote are going to want to know that this type of support is going to continue.

Ms. DARCY. Yes, the CAP programs are an important part of our entire program, and we have three 107 projects now ongoing in Alaska. And that program is one that it is for smaller projects that do not need the full-blown WRDA authorization, and that is why it has been successful, especially in small communities like those in Alaska.

LIQUEFIED NATURAL GAS EXPORTS

Senator MURKOWSKI. Well, we will work with you on that. And since nobody is back, I will take an opportunity. I was in Houston last week at CERAWeek, which is the big oil and gas summit really in the country. And a lot of discussion about the fact that we had just seen that Wednesday the first shipment of LNG leaving Louisiana to head out to Brazil. Obviously exports of LNG (liquefied natural gas) are a big deal for me both because of the Alaska LNG project and because of the energy bill that we are working on that would expedite these approvals.

SABRINE-NECHES WATERWAY

The Sabine-Neches Waterway is probably one of the more important waterways in the Nation. By all accounts it is poised to play a key role in the buildout of LNG exports from the United States, specifically Louisiana and Texas. So if you could just give us a quick update on the 2014 authorization that we need to deepen that waterway.

Ms. DARCY. You are talking about Sabine-Neches?

Senator MURKOWSKI. Yes.

Ms. DARCY. That project currently has a benefit to cost ratio that does not compete well for budgeting at a 7 percent rate. However, our Galveston district is doing and economic update and that economic update I think will be approved in the third quarter of this year. So with an uptick in the economics, there is a possibility that the benefit-to-cost ratio would be improved and make it more competitive for budgeting.

Senator MURKOWSKI. Do you anticipate that that would, given what we expect to see coming out of Louisiana and coming out of Texas with LNG exports?

Ms. DARCY. I think in considering those, since the 4-year ban has been lifted and that can happen now, that will change the economics.

Senator MURKOWSKI. And that will be included as part of your analysis.

Ms. DARCY. It will be considered in it, yes.

Senator MURKOWSKI. Okay. I appreciate that. I am going to utilize a little bit of executive authority and call a recess for the committee until other members get back so that I do not miss this important vote. So we are recessed to the call of the chair.

Senator ALEXANDER [presiding]. Thank you for your flexibility. The hearing will come to order. That was the last vote, so Senators will be here, and Senator Coons was here earlier, so I will call on Senator Coons at this point for his five minutes of statements and questions.

Senator COONS. Thank you very much, Chairman Alexander. Thank you both for your forbearance and for your sound and solid leadership of this subcommittee and others. Thank you for your service and for the opportunity to talk with you today about the Army Corps of Engineers.

DELAWARE RIVER DREDGING

I have been particularly pleased with the service of the colonel who is charged with the Philadelphia district, Lieutenant Colonel Mike Bliss. And I am grateful for your continued support for a project that is near and dear to my constituents, the Delaware River dredging. I am pleased there is another $55 million overall in the work plan to complete the project, so I just want to start by saying thank you since I know not every opportunity is taken to thank you for budget support and for leadership.

DELAWARE BEACH PROTECTION

If I might, Assistant Secretary Darcy, I just want to talk about Delaware's beaches. We have several world-class beaches. They are a key driver of tourism in our region, and they are essential to the economy of southern Delaware. We had a significant storm recently that imposed some very hard damage. We were grateful for previous investment in beach nourishment that protected those beaches, but most of what had been provided in recent years was torn away. That has left a lot of our coastal communities and their infrastructure exposed. I am hopeful that we can work together to find resources.

The President's budget, to my disappointment, did not include funding for Bethany Beach or South Bethany Beach, and as the project information reports from the Philadelphia district come into your office describing damage to Delaware's beaches, I am hopeful that you conclude that the Flood Control and Coastal Emergencies Act Funds that remain unspent from Sandy could be used for Rehoboth, Bethany, and South Bethany.

Do you think that is possible or likely, and if not, what else do you think we could do to rebuild Delaware's beaches and its coastal defenses?

Ms. DARCY. As you say, Senator, we are in the PIR stage which will inform as to what damages were done and what the actual cost of those repairs will be.

As far as using Sandy supplemental funds, I am going to have to defer because I believe that those can only be used for damages

that were incurred from Super Storm Sandy as opposed to subsequent storms. That is something we will check into if the need for the repairs is unmet.

Senator COONS. Given just a visual inspection as well as detailed reports from local government leaders suggest to Delaware's congressional delegation that there will be some significant needs here, what funding source do you think is most likely relevant or appropriate to take action this year?

Ms. DARCY. Probably the FCCE account. That is our Flood and Coastal Emergencies account, but it would depend on how they are evaluated as far as relative to the most recent storm.

Senator COONS. I will join comments made by other of my colleagues earlier in this hearing that it is disappointing that the Administration's funding request is insufficient for what are the likely needs of the whole country. As a member of this subcommittee, I am happy to commit to continuing to support needed increased funding that will make it possible for you to address the needs of Delaware and many other States.

PORT OF WILMINGTON

Let me also turn to the Port of Wilmington. It is on a dredging cycle that really is not sufficient to meet the needs of this port. It is a relatively small port, but it is an important port for my home State. It silts in about every 6 to 9 months, and right now it is causing havoc with the number of customers at the port. I am hopeful that going forward you will consider including funding for two dredging cycles a year. Is this something you are familiar with?

Ms. DARCY. Senator, I am aware that we did provide 2016 O&M dredging for this port at $3.845 million, and also in the President's 2017 budget request we have $4.355 million for the next dredging cycle. So I think an additional dredging cycle is what your question is, sir?

Senator COONS. Yes.

Ms. DARCY. I believe that currently we are budgeting on a single dredging cycle, and that is what I think those numbers reflect.

DELAWARE RIVER BASIN COMMISSION

Senator COONS. Well, I will urge you to reconsider, based on experience at the port, two dredging cycles a year. Let me in my closing moments simply recommend to you again funding for the Delaware River Basin Commission. Although there is a congressionally approved compact that requires a Federal contribution, the Federal contribution has been forthcoming, I think, in 19 of the last 20 fiscal years.

HARBOR MAINTENANCE TRUST FUND

I also am an advocate for the Harbor Maintenance Trust Fund. You have made some significant, I think, improvements. The request is higher. Our funding has improved, but it is still 20 percent less this year than what was appropriated last. I think it would make a significant different for harbors across the country, not just in my home State of Delaware.

So please note me as an advocate for working to ensure that the Harbor Maintenance Trust Fund is put to its appropriate purposes, and that we invest to the level we need to in order to ensure that our export and import businesses that go through our vital ports and harbors are appropriately maintained.

Ms. DARCY. Yes, sir.

Senator COONS. Thank you very much.

Senator ALEXANDER. Senator Udall, I think we have other Republican members coming, but since you are here, I will call on you. And what we have done is because of the votes, we have asked the witnesses to put their statements in the record, Senators have put their opening statements in the record, and now you have five minutes for statements or questions, whatever you would like. Senator Udall.

NEW MEXICO RURAL WATER PROJECTS

Senator UDALL. Senator Alexander, Chairman Alexander, thank you very much. And I guess I lucked out with not having to alternate here.

I want to thank you both for working with the Albuquerque District to fund some important New Mexico projects over the last few years. New Mexico often has a tough time in the President's budget request, so additional discretionary funds that this committee provides and your hard work is really critical in my State.

We have had some good success funding flood control projects in Alamogordo, Socorro, the Southwest Valley, and others, and I am very relieved that we have continued the New Mexico Acacias Program. I hope you know what that is, Honorable Jo-Ellen Darcy.

Ms. DARCY. I visited about 4 years ago.

Senator UDALL. Good. Good. And to support the historic—these are various, you know, historic irrigation canals that also help our local ecosystems and manage water flows.

Additionally, I am pleased that for 2016, the Corps has funded the Rio Grande Environmental Management Program for the first time. It will be important to continue that effort which will link together stakeholders and watershed information to encourage collaboration on water challenges and minimize the potential for counterproductive conflicts. And finally, I am glad we are making progress on reimbursements under the Environmental Management Accounts, specifically for Rio Rancho in 2016. We talked about this issue last year, and I wanted to thank you for your attention to this issue.

The Corps signed agreements years ago with a variety of New Mexico communities to fund water projects, and we need to close these accounts out. So given our recent success—hopefully this is an easy question—will you continue to work with this committee and stakeholders in New Mexico to advance these kinds of projects in a fiscally responsible way if this committee continues to provide additional discretionary funding for the Corps?

Ms. DARCY. Yes, Senator.

GILA RIVER DIVERSION PROJECT

Senator UDALL. Thank you very much. And now turning to the commissioner of Bureau of Reclamation Estevan. Good, solid New Mexican is back here. Good to see you again.

Commissioner López, I want to touch on an issue that is very important to me and one I know you are familiar with, the proposed Gila River diversion project. The Gila River is the crown jewel of the Southwest and one of the last remaining free-flowing rivers in the United States. The river provides amazing opportunities for recreation, wildlife habitat protection, and has unique historic value. And, of course, we are also very sympathetic to the water needs of nearby communities and the agricultural needs.

I understand why any proposal that could mean more water resources is a discussion worth having, but from everything I have seen, this project simply does not add up. My understanding is that a diversion has the potential for about 14,000-acre feet of water, but with significant technical challenges, and only in a wet year that will not happen very often, with construction costs estimated near a billion dollars and would need NEPA approval for disturbing a relatively untouched river system. In short, this does not seem like a viable or wise project.

I understand that the environmental review process is the next step, and the Bureau of Reclamation along with the New Mexico Interstate Stream Commission are joint leads on this. What kinds of analyses will be included in your comprehensive review process? Will the costs associated with this project be fully reviewed in an objective way, because I have said, and please go ahead with those, Estevan, and then I will just finish with these last couple of questions.

Mr. LÓPEZ. Good afternoon, Senator. It is good to see you.

Senator UDALL. It is a pleasure. Great to see you.

Mr. LÓPEZ. And so, to date New Mexico has yet—the New Mexico Unit entity has yet—to propose a project, so we have not yet begun that process. Once they do, it will be a few months before we begin a public scoping process. We would develop a full range of alternatives that would be evaluated in that process, and we would assure that there is a robust analysis that would comport to the Federal principles, requirements, and guidelines for water and land related resource implementation studies. That was part of the agreement that was entered into last November.

Specifically, you asked what type of studies would be looked at. We would intend to look at the impacts on fish and wildlife, hydrology, land use, cultural resources, recreation, and ecosystems, and, by all means, the economics of any proposal that comes forth. We are committed to a robust evaluation of this. As you say, the Gila is truly a jewel in the Southwest, and it is something that needs to be protected.

Senator UDALL. Thank you. And, Senator Alexander, I will submit the rest of my questions to Mr. López for the record. But I just want to say that I have seen estimates that range from half a billion to $1 billion for construction. I cannot see any White House Office of Management and Budget clearing a new billion-dollar Federal water supply project with such limited potential. So thank you,

and I will submit additional questions, and look forward to your answers.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Udall.

Senator Lankford.

CORPS OF ENGINEERS DISPOSITION STUDIES

Senator LANKFORD. Thank you, Mr. Chairman. Thank you all for being here and for the work that goes into this. General Bostick, good to see you again. Let me pepper you with questions. It is so good to see you. How about that?

We have talked a couple of times before about the 2014 water bill that put into it a request to the Corps to say give us an inventory that is not needed—this was the quote—"not needed for the mission of the Corps of Engineers." Obviously it is trying to determine if there may be any properties or entities that are anywhere within the Corps of Engineers that are not needed so that we can spend money on what is essential for the Corps.

How is that study, that assessment going, and when can we expect to have that report?

General BOSTICK. It is good to see you again, Senator. There are a number of activities going that I think are related that I wanted to highlight and talk about. And the first is the deauthorization report that we had to come back to Congress with, $18 billion worth of deauthorizations.

Senator LANKFORD. If my memory serves me correctly, about $14 billion in that $18 billion request.

General BOSTICK. We were able to come up with $14 billion, but in coming with that, we had to do an assessment of many of our projects, so the assessment is underway. We are not complete. We still have a lot of work to do. It is not directly tied to the 6002 report, but it is related. The other thing that——

Senator LANKFORD. So give me a ballpark on timing when that assessment might be complete.

General BOSTICK. I cannot give you a ballpark time on that. What we are trying to do, because we have not started the 6002 report because we have put all of our focus on trying to get the deauthorization report accomplished. We did that, and now we are doing the annual deauthorization, and we will be finished with that in September of 2016.

I think combining the two efforts, we will be closer to doing an overall assessment. What we have done is completed an overall operational assessment of our projects, but we have not made an assessment of which ones we should retain, which ones we should divest ourselves of, and which ones should be repurposed. That is going to be a longer effort.

Senator LANKFORD. Sure. Well, that is why we started it early because you know my next question on that is the disposal process, and once we determine some of the things that might. And I say "might" because we are not asking you to choose those, but at least to start to put together a list of things that are not central to the mission of the Corps. Once we have that list, we have got to work through the process of how do we actually dispose of that.

Any ideas at this point on disposal authorities that the Corps may need once that list is out there?

General BOSTICK. Well, you do have authorities under Section 216, and rather than waiting until we have the complete report finished, we are starting now with disposition on two projects, disposition studies on the Kentucky River Lock and Dam and the West Pearl Navigation Project. So those disposition studies will go on this year.

Many activities are working in parallel. We are not going to wait until the complete report is done, but we are using the deauthorization requirement, both the annual and the one time report required in WRRDA, and also moving forward with 216 authorities.

Senator LANKFORD. Okay. That will be one of those things we will want to talk about at length is if there are additional authorities or ways we can help in that process. Obviously if we have an area where we are not authorizing or allowing or transferring, we do not want it to be more expensive than actually maintaining it. We want to actually have an efficiency of the process with this so you all do not have to worry about that.

ACCEPTING NON-FEDERAL FUNDING DURING EMERGENCIES

Let me ask about another question that came up from the 2014 WRRDA, and that is accepting materials and services from non-Federal entities in the case of an emergency situation. Obviously this has implications around the country, especially in inland waterways and places where we may have an emergency situation.

Congress passed that, and asking for a set of—asking for implementation. We were pretty clear to give that authority. I am trying to figure out if the Corps has the implementation on that, the guidelines for that done at this point. Are those guidelines complete?

General BOSTICK. Yes, we are finalizing initial Implementation Guidance on that. I think where we are finding challenges at the local level is we can accept funds on an emergency disaster type situation, but we cannot accept funds for some of our projects where we have not been able to maintain them.

Senator LANKFORD. So what about—this is an emergency situation just starting with that. What about services? You accept services. So if someone had materials, had equipment, had personnel, a contractor that was there, and a State or a private entity said this is an emergency, we want to be able to help with that. Are you all in a position now with these guidances to be able to accept those goods or services in the time of an emergency?

General BOSTICK. If it is related to a disaster, my answer would be yes.

Senator LANKFORD. Okay. Yeah, all these are contingent on an emergency. That was the definition that was on it, which is left open of what is an emergency. When I talked to several of the folks in the different areas, there seems to be a hesitancy in the field and in the regional offices to accept goods or services or be able to discuss that even of what the process would be in case of an emergency.

Those folks want to plan contingencies, and what I hear is, well, we are studying it. There are not those guidelines in place in the

field. So I do not know if those guidelines had just been released or not, but the individuals that this would actually affect cannot plan their contingencies because they do not know how to connect to the Corps at this point in case of an emergency.

General BOSTICK. We will go back and redouble our efforts to make sure that the Implementation Guidance that we will put out is understood in terms of what they can and cannot accept.

Senator LANKFORD. Okay. If there are additional authorities that are needed on that, we just need to know because if this is going to be an issue of, yes, we technically can, Congress gave us permission, but there are liability risks, and who is going to pay for what if it breaks. And suddenly we are in a position where there is actually not done what Congress said we could do, and there is some gap in it, we need to know in that process so we can actually resolve this. So can you help us with that?

General BOSTICK. We will follow up.

Senator LANKFORD. Great. Thank you. I yield back, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Lankford.

Senator Hoeven.

RED RIVER FLOOD PROTECTION

Senator HOEVEN. Thank you, Mr. Chairman. I would like to begin by thanking Secretary Darcy, also General Bostick, and I see that you brought Colonel Price with you as well. Thank you for your help and your commitment to move forward with permanent flood protection both in the Minot region as well as in the Fargo/Moorhead region in the Red River Valley. It is much appreciated and very important for both regions, so I would like to thank all of you. I would also like to thank the chairman of this committee. I appreciate it very much.

My first question would be to Secretary Darcy and also to General Bostick. And that is in terms of moving forward with the Red River permanent flood protection, if you would please describe for me how you anticipate approaching the Minnesota DNR process.

Ms. DARCY. In the 2016 work plan when we funded this project for $5 million, there was a provision that said that in order to work through the current issues with the DNR, that we would need to have all of those issues addressed before May of this year when the Environmental Impact Statement is due. And then I would need to make a determination as to whether those conditions were met by July of this year in order for us to be able to execute a Project Partnership Agreement by August 30th of this year.

Senator HOEVEN. And I would ask both you, Secretary Darcy, and General Bostick to address, your thoughts on the DNR process, but then also how you are going about addressing upstream concerns as well in regard to the project.

General BOSTICK. I do not have anything else to add beyond what Secretary Darcy talked about on the DNR.

Senator HOEVEN. Okay. And then both of you, just your thoughts on, again, working to bring everybody together and advancing the project, but also working with upstream interests.

Ms. DARCY. Because this is a two-State project, we always have to consider the upstream impacts as well as the downstream. In

this particular situation, given the alternative financing arrangements, we need to be able to work with the upstream interests in order to be able to go forward with both the upstream portion as well as the downstream portion because the downstream portion is the Federal part of the project, and the upper portion is what the local sponsor as well as their private partners are going to be able to finance.

ALTERNATIVE FINANCING

Senator HOEVEN. And if you would, either or both of you talk for just a minute about the unique public/private financing model, and what you hope to accomplish here, and how you see that can provide benefits not only here, but to the Corps in general going forward.

General BOSTICK. When you look at some of the work that we are doing now, just the work that we are currently putting money in our overall program, it would cost about $19.7 billion of additional funds to finish that work currently in construction. And we receive about a billion dollars in construction each year so, on average, it is going to take about $20 billion or 20 years to finish the work that we are currently doing at this rate.

I think it is very important that we look at alternative means of financing where we bring in the private sector, the public sector, to see if we can accelerate these projects because when you take that long to complete these projects, the benefits are not accruing obviously, and the BCRs come down, and the people are just unsatisfied. So I think alternative financing is something that we must do. This is a first effort to move out on them.

Senator HOEVEN. Madam Secretary, did you have anything you wanted to add?

Ms. DARCY. I would concur with General Bostick's comments, and the fact that this is one of the first times the Army Corps of Engineers has approached a project in this way, it shows that we are open to looking at alternative ways of financing these projects with limited funding. In this instance because there are upstream concerns as well as downstream, we are going to take a really close look at all of this. I am going to have someone from my staff work with the upstream States in the next month to try to make sure that we can get this all agreed to in the timeframe that we have.

Senator HOEVEN. Thank you. And also, I want to, I guess, again emphasize the creativity that you are showing in both of these projects, not only the public/private partnership, but also in Minot you are—by providing for a study, you are allowing the State and locals to go forward and build flood protection while we are working on a—on the Federal portion of the project.

That is the kind of creativity that is not only going to save billions of dollars across the country for the Corps and for the Federal Government, but it is going to get these projects done sooner. So that creativity in the case of the Minot region is enabling them to start building using State and local funds. And so, I think, you know, just incredibly important that you are providing this flexibility, and, again, I want to thank you for that.

And, Mr. Chairman, I do have some more questions. I will certainly defer until the next round, but I just wanted you to be aware.

Senator ALEXANDER. Thanks, Senator Hoeven. Just to—we will have a second round of questions. Just a comment on that. This has been an interesting discussion with me. The leadership of the committee has worked with Senator Hoeven and with the Corps of Engineers on a new approach toward dealing with this backlog of important projects. And it will be interesting to see if this significant State and local contribution, when matched with the Federal flexibility and Federal dollars, provides a way in the future to take that $20 billion figure and move more rapidly in it.

So I appreciate the flexibility that you have shown in your leadership of the Corps to work with this committee and with Senator Hoeven on that issue. I think taxpayers would be pleased with us for seeing how this works, and particularly taking a project where there has been such a significant State and local investment. It is easy for me to say because North Dakota is a long way from Tennessee.

Let me ask two or three questions here, and then I will go to Senator Feinstein, and then we will see if other Senators have other questions.

HARBOR MAINTENANCE TRUST FUND

Let me talk about the Harbor Maintenance Trust Fund. This is something that—well, a few years ago several of us, including Senator Feinstein, reared back and asked our staff what would a great country like the United States—what kind of harbors do we need, particularly in light of the widening of the Panama Canal. We came up with a figure, and Congress passed a bill, set a target, and we have met that target for a couple of years.

Now, we are talking about ports like Los Angeles, Long Beach, Oakland, Mobile, Savannah, Charleston, Memphis, Louisiana, Cleveland Harbor. These are important parts of our commerce in this country, and for two straight years this committee has been able to meet our goals in terms of deepening these harbors so the ships can do their work there and not do it in ports in other places in the world.

Now, we also collect money from the private sector when they come into the harbors. So my question, Secretary Darcy, is how much money do you expect to collect in fiscal year 2017 in the Harbor Maintenance Trust Fund?

Ms. DARCY. Senator, I believe that the Treasury has made an estimate that in 2017 we would be collecting $1.6 billion. I think it is down from what Treasury projected in 2016. I think it is $1.6 billion.

Senator ALEXANDER. Okay. How much——

Ms. DARCY. In collections in 2017.

Senator ALEXANDER. In collections in 2017 to the Harbor Maintenance Trust Fund is the Treasury estimate. How much does the budget propose that we spend of that $1.6 or $1.7 billion?

Ms. DARCY. The President's budget request for the Harbor Maintenance Trust Fund is $951 million for fiscal year 2017.

Senator ALEXANDER. So we are collecting taxes for a dedicated purpose at about $1.6 or $1.7 billion to deepen ports to improve commerce, but we are just going to keep the money and not spend it even though we take it. And as a result of those kinds of practices, the Harbor Maintenance Trust Fund today has over $9 billion in it, money that was collected from ports, from people doing business in the port with the expectation that it would be spent to keep the ports in good shape and we are just stacking it up in the Federal bank.

INLAND WATERWAY TRUST FUND

We talked a little earlier about the Inland Waterway Trust Fund. We do not want that to happen there. We do not have much money in the Inland Waterway Trust Fund that is unspent. Am I correct about that?

Ms. DARCY. Currently, I think the unspent balance in the Inland Waterway Trust Fund is $106 million for 2017.

Senator ALEXANDER. The unspent, but we could spend that for—I mean, that is yet to be determined how much of that we are going to spend, correct?

Ms. DARCY. Yes, because that would have to be matched with other revenues from the budget.

Senator ALEXANDER. But if we matched it in 2017 as we did in the current year, then there would be almost no unspent money in the Inland Waterway Trust Fund. Am I correct about that?

Ms. DARCY. If there was a 50 percent match coming from General Treasury and coming from the Corps budget to match, that is possible.

Senator ALEXANDER. But on the Harbor Maintenance Trust Fund, we already got $9 billion that should have been spent on our harbors, yet the President's budget only asks for $986 million, about $194 million short of the target that Congress set for this year. So we are going to continue to build up the unspent money in the trust fund. I am very concerned about that.

NATIONAL FISH HATCHERY

Let me ask you a different—completely different question. TVA, the Bureau of Reclamation, the Corps of Engineers all mitigate the loss of fish caused by the dams that they operate. This is a general subject that Secretary Darcy and I have discussed before, but not a specific one. The Corps of Engineers purchases fish from the National Fish Hatchery at Dale Hollow and Irwin to restock fish in the Cumberland River where there are dams and excellent fishing, by the way. TVA is mitigating that loss of dam—loss of fish due to the dams. It operates on the Tennessee River.

So you are already doing what I think you should be doing. But my question is, does your budget request sufficiently reimburse the Fish and Wildlife Service to ensure our Nation's mitigation fish hatcheries can continue to meet the mitigation needs?

Ms. DARCY. Yes, it does, Senator.

Senator ALEXANDER. Thank you, Secretary Darcy, and I greatly appreciate your personal attention to that.

I am about out of time, so why do I not go to Senator Feinstein, and then I see Senator Hoeven, I think, also has questions.

BOAT TURBIDITY STUDIES

Senator FEINSTEIN. Thanks very much, Mr. Chairman. Mr. Chairman, you and I and certain members in the House of Representatives were able to get $100 million in the omnibus for drought. That money is still there. The President did not ask for the money to be continued in 2017; however, it is there for the remainder of the year. And I am wondering, Commissioner López, would it be possible to use some of that money to begin to do boat turbidity studies in the turbid waters both 12 miles and 17 miles from the pumps to determine with some accuracy the degree of smelt that are present?

Mr. LÓPEZ. Senator, I think that we have created a spending plan for that money, and we have tried to build in maximum flexibility to use that in the way that is going to be deemed the most useful. So I think that we can. I think my answer to your question is that we can expend some of that money for those purposes.

I have recently seen some correspondence in preparing for this hearing that calls into question the utility of that sort of thing simply because there are so few smelt that are out there. But I can certainly look into that, and I think we do have a mechanism by which we could use some of that money for that purpose.

Senator FEINSTEIN. Well, I thank you very much for that. Now, we know the smelt gravitate toward turbid waters.

Mr. LÓPEZ. That is right.

Senator FEINSTEIN. And so, it seems to me that the monitoring should be in the turbid places, and the turbid places where decisions are made about operations of the pumps. We are in a drought emergency proclaimed by the governor. It seems to me that this is an appropriate use of that money, and I would like very much to work with you to see that the appropriate monitoring gets set up as quickly as possible because time is a-wasting. If we have El Nino, it is going to be in the next couple of months or this month and maybe through March, so this means moving with it. So I am going to get out my needle and start poking at you, and I thank you for that answer.

SHASTA DAM AND LOS VAQUEROS

I would also like to ask this question, and I go to pages 407 and 408 of the omnibus. 407 stated that "The commissioner of Reclamation shall complete the feasibility studies," and in this section on 407 it refers to Shasta Dam. That was completed in December of 2015. The next section on 408 refers to sites in Los Vaqueros by November 30th, 2016. Will you complete those studies?

Mr. LÓPEZ. Senator, for both Sites and Los Vaqueros, we need to work with non-Federal partners to fund even the study portions of these. And to date, we do not have those agreements in place, further——

Senator FEINSTEIN. Commissioner, it is has been 9 years. We are in our 10th year.

Mr. LÓPEZ [continuing]. The proponents, the Sites JPA and Contra Costa, have both recently—as recent as last week, come to us and asked that we actually slow the process down a little bit to be more in line with the State's process of the funding proposals

that will be taken in November of 2017. They want to assure that the study we do comports not only with our requirements, but whatever requirements the State is going to have. And so, we are working with them to try and position——

Senator FEINSTEIN. Well, let me say something. This is a law. It is not "may complete." It is "shall complete." So if you would relay to the Sites JPA my concern that this has taken too long, and you are now mandated by law to complete these studies. Sir, I suggest you do it.

SAN LUIS EXPANSION

There is a third one, and that is the feasibility study that has to do with the San Luis expansion, "shall be completed not later than December 31, 2017." This is not up to the Sites JPA to make these decisions. You have the law.

Mr. LÓPEZ. Senator, going back to sites, we do have that mandate. You are absolutely correct. We recognize that. What we do not have is we do not have the funds to do the work that is——

Senator FEINSTEIN. Then I suggest you use some of the drought $100 million to get it done.

Mr. LÓPEZ. We will look into it, Senator.

Senator FEINSTEIN. But really, sir, you have got one California Senator that is going to ride this. We worked hard to get these things in that omnibus, and they are there now. And it is not "may," it is "shall." And I think—I have met with the committee. I think they are doing very good work, but they are not the law, and this is the law. So you can quote me, and if they have a problem, they can come see me, okay?

Mr. LÓPEZ. Senator, I will convey that to them.

SEISMIC SAFETY PROJECTS

Senator FEINSTEIN. Thank you. Secretary Darcy, there are four critical seismic safety projects, California VA projects: L.A., San Francisco, Long Beach, and San Diego. And they will be part of this new construction partnership between the Army Corps and the VA. And I would like to ensure that they proceed as quickly as possible because the seismic risk in California is not going down. It is going up. So when do you expect to execute the joint agreement with the VA regarding the new collaboration?

Ms. DARCY. I do not know. I am going to ask General Bostick if he might know. He has been working more closely with the VA on these issues than I.

General BOSTICK. I have worked with Secretary McDonald very closely in discussions on how some of these projects would transfer. The first one obviously was the Aurora Hospital in Colorado, and we are complete with that transfer, and we are starting to work on it. We are taking each of these one at a time and assessing them on a case-by-case basis, but moving out as rapidly as we can. Much of——

Senator FEINSTEIN. Could you give me some times, please? I do not want to ask your successor 10 years from now, if I am still alive, what happened.

General BOSTICK. The overall understanding is already completed. If it is over $100 million, as in the cases of the California

hospitals, there is already agreement that the Corps will take those on. The next step is to determine if the designs are appropriate for us to move out and award a contract. That work is ongoing.

Senator FEINSTEIN. Okay. Well, that is good news. Do you have a specific timeline for when seismic safety projects can proceed?

General BOSTICK. I do not have a timeline, but I will respond——

Senator FEINSTEIN. May I ask that perhaps before you leave you could get a timeline? You set the course for your successor?

General BOSTICK. I will do that.

Senator FEINSTEIN. This is important, so thank you. And is there any—do you have any thoughts on how this collaboration, and maybe it does not affect these projects. But will they introduce of themselves time delays?

General BOSTICK. I cannot speak to the group of them in total, but if the project has not started, and some of these are brand new projects if they have a design, then we can just take that design if the design is adequate, then we can move out and award a contract. In the case of Aurora, for example, that took us a lot longer, a number of months in order to transition that one. So I would say it is a case-by-case situation, but I think it could be a clean transfer depending on the design.

Senator FEINSTEIN. So my job would be to see if the VA facilities in L.A., San Francisco, Long Beach, and San Diego have a design. Is that correct?

General BOSTICK. We can work on that, Senator.

Senator FEINSTEIN. Okay. Well, we will check.

General BOSTICK. We will follow up with you on that.

Senator FEINSTEIN. And I would appreciate it if you could let me know.

General BOSTICK. We will.

Senator FEINSTEIN. The question is do they have a design, and I thank you, General, very much.

Thanks, Mr. Chairman.

Senator ALEXANDER. Thanks you. Thank you, Senator Feinstein.

Senator Hoeven, whatever time—take time to ask whatever questions you may have.

LAKE TSCHIDA

Senator HOEVEN. Thank you, Mr. Chairman. Commissioner López, we have discussed Lake Tschida, Heart Butte Dam a number of times. You have been out, and I appreciate you coming out. I am drafting legislation to try to address this issue. We continue to work on trying to find a solution.

Specifically, my legislation would direct the Bureau to allow permittees in the trailer areas around Lake Tschida to keep their existing trailers on the lots as long as they comply with anchoring requirements set forth by the Bureau. These permittees have made investments and improvements to the lots and trailers over the years, all with the consent of the Bureau. I think this would be a good compromise to ensure dam safety while also allowing trailer owners to get full use out of the investments that they made honestly with the approval of the Bureau.

So my question is, would you be willing to work with me to find agreement on legislative language that would satisfy the Bureau's

concerns while giving fair treatment to the trailer owners around the lake?

Mr. LÓPEZ. Senator, I would certainly be willing to work with you on trying to develop legislation that would meet both those needs. You know my concerns about the trailers being within the flood pool and the concerns that that creates for us. If there is legislation to be worked on, we would work with you on it.

MARKET RENT SURVEYS

Senator HOEVEN. Thank you. I appreciate that. The other question I have is in regard to some of the recent market rent surveys that have been done by the BOR. As a result of those surveys, rents will double at Heart Butte Dam, Lake Tschida, but they triple at the Jamestown Reservoir and the Dickinson Reservoir. And my understanding is that any rents received go into maintenance and management of the reservoir.

And so, my first question is, is the Federal Government making a profit on this, or is all that money being put back into management and maintenance at those reservoirs?

Mr. LÓPEZ. Senator, I do not believe we are making any profit on anything, and the money that we collect is used in the O&M of those reservoirs.

Senator HOEVEN. Well, and essentially where I am going with this is, you know, those are very significant increases. We are hearing from the people that live around those reservoirs and have homes around those reservoirs. And there is a real concern that the rents are being raised well above what is going into management and maintenance at the reservoir, and well in excess of what those management and maintenance needs or expenses are.

And that is a real concern because I think those rents are supposed to be limited to the management and maintenance need costs of those specific reservoirs. And so, I would ask that you work with us to look at those and make sure that the increases are not unreasonable, and that the money is not being used for some other purpose.

Mr. LÓPEZ. Senator, I commit that we will look into that question, and assure that we are not collecting any more than we can use for those purposes.

Senator HOEVEN. Thank you, Commissioner. I appreciate it. Thank you, Mr. Chairman. Those are all the questions I had. I appreciate it.

Senator ALEXANDER. Thanks, Senator Hoeven. I have got a couple of questions.

INLAND WATERWAYS

Secretary Darcy, back to inland waterways. When we took the big step forward on inland waterways, Congress, among other things, got an agreement about what the priorities are for the inland waterways. The users agreed to that as well, and that helped us have some priority. That was the 2010 Capital Development Plan. Last year—the Congress then asked—told you to do a 20-year plan, but in our appropriations bill last year we said you should use the 2010 Capital User Development Plan priorities until we have a chance to review the new plans.

So my question is, will the Corps' new plan keep the list of priorities in the 2010 Capital Development Plan that has been endorsed by the inland waterway users?

Ms. DARCY. Senator, we will be having the new capital investment strategy delivered to you all before the month is out, so we will be able to discuss the specifics of that while you are putting together the bill for this year. I have not reviewed the final study to be quite honest with you, so I cannot answer whether they are the same priorities or not. But as I say, we will be getting that to you before the month is out, so.

Senator ALEXANDER. Well, you know the priority I am interested in.

Ms. DARCY. Let me guess.

REHABILITATION PROJECTS

Senator ALEXANDER. Yeah. And along that line, as you make your review, let me ask you to comment on something that really affects all of your projects, and that is the economic analysis that you use to justify a project, which I would assume you are going through now as you make up—as you finish this new plan. Funding the projects is largely based on their so-called benefit-to-cost ratio. The higher the ratio, the better the chance the project gets funded, the higher up the priority list.

I am concerned that the economic analysis for a project may not accurately take into account the true benefits. For example, your economic analysis may—let us take the Chickamauga Lock, for example. In 2004, 2.7 million tons of cargo were moving through the lock every year. That was 12 years ago. Today it is closer to one million tons.

Now, one big reason it has gone from 2.7 to one million tons is because the lock is in bad shape and needs to be replaced. And so, if you based your benefit-to-cost ratio upon the current lock cargo, it would not be realistic because when you fix the lock, one would assume that you would be back up to some number. I do not know what number. Maybe it would be 2.7, or maybe it would be more, maybe it would be a little less.

But do you not think that has become outdated or inappropriate to base your benefit-to-cost ratio on the way things are today in a lock that has for 12 years been in such bad shape that a lot of cargo simply could not go through it?

Ms. DARCY. I do agree, Senator, because in our equations that we developed for rehabilitation projects, I do not think that we take into account the historic significance of these projects. And I think that we are losing those benefits in making a future calculation.

As you know, rehabilitation projects do not compete well in the budget because they have a lower benefit-to-cost ratio because of that. I think we need to look at how we do the evaluations for the benefit-to-cost ratio and rehabilitation projects in a different way, and account for not only historic patterns—historic benefits that they have brought, but without that lock, what would have been lost if we did not have that lock. That calculation, and all of the benefits that it has brought not only up until one point in time, but historically, I think needs to be calculated for a rehabilitation project.

COMPLETING CONSTRUCTION PROJECTS

Senator ALEXANDER. Well, that is important testimony coming from someone with your experience both in Congress and in your current position. And finally, there also ought to be something to consider—I mean, should we not complete projects we have already started to build? For example, in Kentucky Lock we have already spent $471 million, and on the Chickamauga Lock, we have already spent $216 million. And as we have discussed, over the last 2 years working with Congress, you restarted construction.

But should we not take into account the fact that we complete projects that we have already started to build?

Ms. DARCY. I think we should take that into consideration, and I think finishing what you have started is a laudable goal. It is just not always one that we are able to achieve in the current fiscal situation.

Senator ALEXANDER. There were several rules of life I learned from my parents, and one that I learned from my father was finish what you start, which turns out to be a pretty good rule of life, and might even be good for the Corps of Engineers.

I do not have any more questions. I will ask Senator Feinstein if she does, and then after that, her comments, we will conclude the hearing.

RESPONDING TO THE SUBCOMMITTEE'S QUESTIONS FOR THE RECORD

Senator FEINSTEIN. I have one, and I think it will surprise you. Madam Secretary, this committee held the Army Corps fiscal year 2016 budget hearing last year on February 11, after which members of this subcommittee submitted about 50 questions for the record. Believe it or not, we just received the responses to those questions yesterday evening, so it took a full year after the hearing to get the answers back to us.

I do not think you find that acceptable, and I do not find it acceptable. So can you help me understand why it took the Corps over a year to provide the responses to questions from this subcommittee?

Ms. DARCY. Senator, it is an unacceptable time, and for that I apologize. There is a lengthy review process within the Administration that takes place in order to respond to questions, and it is too long. And I will try to come through with a commitment to make it a shorter time because I will not be here a year from now, so I want to be able to get you the answers to your questions in a more timely manner this year.

Senator FEINSTEIN. Well, let me ask you, what do you think is a reasonable response time, because we are going to submit some questions from this hearing. And, candidly, I would like them back in a couple of weeks because there are issues that are pressing.

Ms. DARCY. They are answers to questions that you need the answers to in order to formulate your bill.

Senator FEINSTEIN. That is right.

Ms. DARCY. And, you know, that happens this summer and this fall. I think 3 months is more than enough time for us to be able to respond to your questions.

Senator FEINSTEIN. So are you saying you put a response time of 3 months, and that we would have our questions answered in 3 months?

Ms. DARCY. That is my goal.

Senator FEINSTEIN. What do you think?

Senator ALEXANDER. Well, if you had not asked that, I was going to. So here is what I think. My guess is that part of the fault lies with the Office of Management and Budget. I do not expect you to comment on that. But I think here is what we ought to do. I think——

Senator FEINSTEIN. Well, can I? Are you saying the Office of Management and Budget reviews the answers to questions?

Senator ALEXANDER. My guess is they do, right?

Ms. DARCY. That is correct.

Senator FEINSTEIN. They do?

Ms. DARCY. Yes, ma'am.

Senator ALEXANDER. Yeah, that is the way they work.

Senator FEINSTEIN. Ask her if she could tell us why.

Ms. DARCY. Okay.

Senator ALEXANDER. Why?

Ms. DARCY. Any of the responses that come to Congress from agencies are reviewed by the Office of Management and Budget.

Senator FEINSTEIN. Oh, my god.

Senator ALEXANDER. Well, I would say to Senator Feinstein, and, you know, I would guess that the idea of underfunding the inland waterways and the Harbor Maintenance Account did not come from the Army Corps of Engineers, but probably came from the budget process. And so, here is what I think we should do.

Three months, Senator McConnell, and he has talked to Senator Reid about this. We hope to move rapidly on the appropriations process this year. We hope to keep big controversial riders off the committee bill.

Senator FEINSTEIN. Good.

Senator ALEXANDER. And they can debate them on the floor if they want to do that, and hopefully Senator Feinstein and I could do that. So we are moving pretty fast. This is our second hearing. We have got two more, and we would like to be finished by when, Tyler?

[Off audio.]

No, with the bill.

Well, he said early May. I am thinking maybe mid-April would be—would be better. So 3 months, that is just 6 weeks away. So I would suggest Senator Feinstein and I write a letter both to the Corps of Engineers and to the Office of Management and Budget and say we find this unacceptable. You have said you are going to do your best to get answers in at least by 3 months, that we are moving on a fast pace on appropriations. And there may be some questions that we would like to have an answer to more rapidly than that.

You have got a background of work on the Hill, and we can talk with you about that in an informal way. But it is very important to us to know your thinking before we write the bill.

Senator FEINSTEIN. Yes, that is right.

Senator ALEXANDER. So we will formally write the letter would be my suggestion if you would agree.

Senator FEINSTEIN. That is fine with me.

Senator ALEXANDER. And then we will ask staff to work with you informally on the questions that we think are the most important to us as we draft the bill. We would like to be among the first in line when we present a bill to Senator McConnell and Senator Reid to put on the floor, and I am hoping it is mid-April or not long after that when we are finished with the bill.

Senator FEINSTEIN. And I hope that we can keep our questions relatively limited to the need for this particular session and our budget—our appropriations bill.

Senator ALEXANDER. Yeah, so we will work with you. I mean, Senator Feinstein and I will work with you, and if you say, look, I have got 100 questions here, are there 20 that are more important, we will help you—we will help prioritize that. And that will be easier for you to give us responses to that. And there may be some cases where you could simply give us an oral response.

Senator FEINSTEIN. That is right.

Senator ALEXANDER. Just answer a question, and we do not—we will not have to go through a lengthy process. Senator Feinstein, do you have other questions or comments?

Senator FEINSTEIN. No, I am fine. Thank you very much, Mr. Chairman.

Senator ALEXANDER. Well, I want to thank all the witnesses for being here today. I am sorry about the voting interrupting, but I think we Senators had a chance to ask their questions and to make their testimony. We, again, thank Secretary Darcy and General Bostick for working with us, especially since this may be their last hearing before the subcommittee.

ADDITIONAL COMMITTEE QUESTIONS

The hearing record will remain open for 10 days. Members may submit additional information or questions for the record within that time if they would like. We would like to have all responses to questions to be provided within 30 days of receipt. You said 3 months. For the priority questions or most questions, we would like to ask for 30 days.

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

QUESTIONS SUBMITTED TO HON. JO-ELLEN DARCY

QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

Question. Currently, the General Reevaluation Report (GRR) and accompanying Supplemental Environmental Impact Statement (SEIS) for the Port of Mobile is on-going. Together, they are expected to take approximately 4 years to complete, which is around 2019 or 2020. Secretary Darcy, can you give me an update on the status of this undertaking and what, if anything, can be done to expedite this process?

Answer. Preparation of the Supplemental Environmental Impact Statement, will require consultation with various resource agencies to satisfy the National Environmental Protection Act requirements. Coordination with a wide variety of Federal, State, and local agencies (U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service, the Environmental Protection Agency, Alabama Department of Environmental Management, Alabama Department of Conservation and Natural Resources, the State Historic Preservation Office, etc.) is currently on-going. Coordina-

tion is also ongoing with State and Federal Environmental Agencies to include discussion of the modeling needs of the project and begin the process of identifying realistic beneficial use opportunities for the dredged material from this project. Sediment removed in association with the potential deepening and widening of up to 37 miles of channel could generate up to 63 million cubic yards of material. Currently, the U.S. Army Engineer Research Development Center is collecting data to establish the existing and baseline environmental conditions of the project area. The Corps has met with the USFWS and work has begun on the Fish and Wildlife Coordination Act Report. Additionally, the documentation of the existing conditions for the benefit-cost analysis is complete. This task included gathering economic and demographic data, close review of Mobile Harbor's operational practices and trends, and gathering historical commodity flows and fleet data. Coordination is ongoing with the Corps' Institute of Water Resources and the Port to determine the commodity forecast for the Port, which is a critical step in the benefit analysis.

The proposed study duration was initially 56 months, but has been expedited to allow the study to be completed in 48 months. Currently, no additional measures have been identified that would allow the study schedule to be further accelerated.

Question. Assistant Secretary Darcy, an issue of importance to the State of Alabama is the ongoing water dispute involving Georgia, Florida, Alabama, and the Army Corps of Engineers. This Committee, included language in the last year's appropriations bill specific to this issue. In addition, the 2013 WRDA Conference Report contained language in Section 1051 that encouraged the governors of Alabama, Florida, and Georgia to reach a compromise to once and for all resolve this matter stating that "[a]bsent such action, the Committees of jurisdiction should consider appropriate legislation to address these matters including any necessary clarifications to the Water Supply Act of 1958 or other law." Unfortunately, a resolution to this decades long dispute does not seem any closer than when it began. On May 4, 2015, the Corps signed a Record of Decision regarding a Water Control Manual (WCM) update that applies to the ACT River Basin. Both States of Alabama and Georgia have filed lawsuits relating to the ACT WCM, with no resolution in sight.

Subsequently, on October 2, 2015, the Corps released a Draft Environmental Impact Statement (DEIS) pertaining to the WCM for the ACF River Basin. In comments recently submitted regarding the ACF DEIS, Alabama, Florida, and even the Environmental Protection Agency noted multiple concerns that the current proposal is contrary to legal rationale, public policy, and prioritizes one State's water needs over others. Assistant Secretary Darcy, can you respond directly to and elaborate on the concerns surrounding both the ACT WCM and the proposed ACF WCM? In addition, given its troubled history of decisionmaking in both the ACT and ACF basins, wouldn't it be best to leave such decisions to the affected States to work out their difference regarding these basins without unproductive Corps interference, including Federal legislation enabling such, if necessary?

Answer. The purpose of Water Control Manuals is to determine how Federal projects should be operated for their authorized purposes, in light of current conditions and applicable law. The Corps commenced its most recent efforts to update the master water control manuals for the systems of Federal improvements in the Alabama, Coosa, and Tallapoosa (ACT) and Apalachicola, Chattahoochee, and Flint (ACF) River Basins in October 2007 and January 2008, respectively. The purpose of the updates is to reflect changes in water usage and best practices about water resource management.

The water control manual updates will not determine how the waters of either basin will be allocated among the States. However, the Department of the Army has continuously expressed to the Governors of Alabama, Florida, and Georgia the Army's willingness, within the limits of its authority, to adjust the operation of the Corps projects in the ACT and ACF systems to accommodate any allocation of waters within those basins upon which the three States agree, and to provide technical assistance if requested by the States in reaching an agreement.

The Corps is currently in the process of reviewing public comments submitted on the draft EIS and water control manuals for the ACF basin. The Corps is considering all comments, and is committed to working with State and Federal agencies and stakeholders to address concerns. A final EIS and approval of the updated ACF master manual are anticipated by March 2017.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

VETERANS AFFAIRS CONSTRUCTION PROJECTS

Question. Secretary Darcy, the 2016 Defense Authorization Act directed the Department of Veterans Affairs to work with the Army Corps to make the VA construction process more efficient, and Congress provided an additional $100 million to compensate the Corps for this new mandate.

There are four critical seismic safety projects at California VA facilities (Los Angeles, San Francisco, Long Beach, and San Diego) that will be part of this new construction partnership between the Army Corps and the VA, and I want to ensure that they proceed as quickly as possible, given the seismic risk in California.

When do you expect to execute the joint agreement with the VA regarding the new collaboration?

Answer. The Corps and the Department of Veterans Affairs (VA) have already entered into the initial Inter-Agency Agreements (IAA) for two of the four of the projects in question. The San Francisco IAA was signed on November 13, 2015 and the Long Beach IAA was signed on February 4, 2016. The agreements for the two remaining projects, West Los Angeles Buildings 205/208 and San Diego are expected to be signed in the coming months. As the projects proceed towards construction award this will require the agencies to modify these IAAs.

The Corps will make every effort to process IAA modifications in a timely manner and ensure that these projects are completed efficiently. The Corps will remain vigilant to avoid unnecessary cost growth and incorporate sound engineering practices to protect public safety.

Question. Do you have a specific timeline for when seismic safety projects in California can proceed?

Answer. Based on an initial assessment of the projects, the Corps is forecasting a spring 2017 construction award for most portions of the Long Beach, San Francisco, San Diego, and West Los Angeles projects. San Diego and West Los Angeles projects were already completely designed under contract by the VA, and Long Beach and San Francisco are anticipated to have completed designs in June 2016 and November 2016, respectively. The construction award date in spring 2017 is a forecast, because the Corps must also perform a Design and Cost Validation process in order to accept these projects. Once the Corps completes this process, and they are satisfied that the technical solution, design and construction approach, and cost is appropriate, they can work to solicit and award the projects. As the Corps continues with this assessment phase of the individual project designs, they will refine schedules accordingly with the intent of saving time, where possible, while still implementing sound engineering practices. The duration for construction completion for each project is still pending further evaluation and will be based on the required work for each of the facilities.

Question. How will you ensure that the new collaboration does not introduce lengthy delays into the process?

Answer. There have been many discussions between the VA and the Corps to reduce delays and gain efficiencies where practicable. On the other hand, the new collaboration may itself lead to some delay in execution. Introducing a new responsible design and construction agent requires that the agency assume many significant responsibilities; the Corps must ensure that the work already done meets public safety needs, application of sound engineering practices, and code requirements, and that in entering into this collaboration, it does so with a goal of achieving and managing cost and schedule expectations. Public safety, sound engineering, the maintenance of professional relationships, and the appropriate due diligence to cost and execution issues are paramount. The Corps assessment process evaluates the technical solution and design approach, estimated construction cost, and forecasted construction duration to ensure that expectations are met and public safety is assured.

The Corps understands that many areas of California have seismic risks, and will work with the VA to mitigate risk and avoid unnecessary delays.

SOUTH SAN FRANCISCO BAY SHORELINE

Question. The San Francisco Bay region is extremely vulnerable to rising sea levels as a result of climate change. Nearly 200 square miles of the communities in the region sit in low-lying areas along the shoreline, including some that are more than 13 feet below sea level.

The South San Francisco Bay Shoreline Study was originally authorized by Congress in 2002, but the Chief's Report was only just completed in December of 2015, more than a decade later.

Secretary Darcy, as you well know, this project is very important to me. It will restore 2,900 acres of former salt ponds, create a new recreation area, and construct a four mile long levee to protect homes, high-tech businesses, and the new Silicon Valley water purification center. This work is very important to the local economy, safety, and quality of life for my constituents.

I want to thank you for including $3 million in the fiscal year 2016 work plan for pre- construction engineering and design work for Phase 1 of the project.

What is the timeline for this step in the process, and when do you expect the project to be ready for construction?

Answer. The next scheduled milestone is execution of a Design Agreement for Preconstruction, Engineering and Design (PED) with the non-Federal partners. The current schedule identifies completion of PED by September 2017.

Question. How long do you estimate Phase 1 construction will take?

Answer. The Corps estimates that it would take around 4 years to construct phase I of this project once physical construction begins, assuming the availability of funding at the maximum level that the Corps can efficiently and effectively use for this project.

Question. Do you plan to prioritize funding the in fiscal year 2017 work plan for studies for the next phase of this project?

Answer. Should the Congress provide additional funding for which this study of the next proposed phase of this project would qualify, the study would be considered for funding in the 2017 Corps work plan along with other programs, projects, and activities across the Nation in competition for the available Federal resources.

CALIFORNIA DROUGHT AND ARMY CORPS "BIG PICTURE"

Question. California's population has grown to 40 million people according to recent census data. However, the State's water infrastructure is largely unchanged from when it was built 50 years ago when California was home to only 16 million people.

The drought in California is a powerful example of how important it is for our country to keep up with changing water infrastructure needs.

I understand that the Army Corps has conducted a large-scale study to assess flood risks and ecosystem restoration opportunities in California's Central Valley and in the Delta.

I also understand that there have been studies of individual watersheds in and around the Sacramento and San Joaquin River Basins.

Given continuing population growth and more unpredictable weather as a result of climate change, it is more important than ever that the Federal Government looks at water infrastructure in a "big picture" way rather than on an individual study-by-study basis.

Secretary Darcy, what steps has the Corps taken to look at water infrastructure in a holistic way and ensure that different individual projects are incorporated into a "big picture" understanding of future needs?

Answer. California's water resources management challenges are complex. As the Corps carries out its missions of flood and storm damage reduction, commercial navigation, and aquatic ecosystem restoration in this State, we are mindful that tens of millions of people live and work there.

In Northern California, an example of a Corps effort in support of watershed-level planning is the Sacramento and San Joaquin Comprehensive Basin Study (also known as the Central Valley Integrated Flood Management Study (CVIFMS)), which focuses on the Sacramento River Basin. CVIFMS is intended to be a Federal companion to the California Department of Water Resources' Central Valley Flood Protection Plan, which is the State's plan for long-term sustainable flood management in the Central Valley. The goals of CVIFMS are to:

—Develop and share a consistent and mutually complementary system-wide strategy for flood risk reduction and environmental stewardship with the State of California;

—Provide a blueprint to connect water resources management actions across the Sacramento, Yuba, American, and Feather River watersheds.

In evaluating water resources options in the Sacramento River Basin, the Corps is building on earlier studies, such as the American River Common Features and West Sacramento General Reevaluation Reports, and the Sutter Basin Feasibility Study, to update the system's multi-purpose performance baseline. The Corps work on CVIFMS continues to inform other studies, such as the Sacramento River General Reevaluation Study which began in July 2015, and has enabled the Corps to strategically align many of its regional, interagency activities.

In Southern California, the Corps is currently working with the Responses to Climate Change team and in particular with regard to impacts to Corps' projects due to extreme drought. A Drought Contingency Plan (DCP) Project Delivery Team (PDT) is working to assess the applicability of current available Drought Contingency Plans documents, as well as the need for updating these documents. The DCP PDT consists of Corps personnel nation-wide, with at least one representative from each Division. This endeavor to derive updated guidance for preparation of DCPs is still ongoing.

Question. When evaluating projects, particularly in California, does the Corps consider how they impact the State's overall water supply infrastructure and needs?

Answer. The Corps' role in water resources management is focused on its three main missions—flood and storm damage reduction, commercial navigation, and aquatic ecosystem restoration. The Bureau of Reclamation has responsibility for the Federal Government's involvement in water supply planning and operations in California.

However, the Corps is cognizant of California's significant water supply challenges. While Corps studies and projects focus on its three main mission areas, the Corps works with the Bureau of Reclamation, the California Department of Water Resources, as well as other Federal, State, and local agencies, in order to ensure the Corps work in California complements their effort on water supply.

An example of this coordination is the Joint Federal Project at Folsom Dam. This project is a cooperative effort between the Corps and the Bureau of Reclamation. Once completed, it will help to further reduce the flood risk in the Sacramento region; and at the same time, Reclamation (which is the owner and operator of the dam) will have more flexibility in maintaining water storage levels at the Dam.

Also, at the request of the non-Federal sponsors, the Corps is currently working on two Feasibility Studies to conserve water for Whittier Narrows Dam and Prado Dam. The dams' original authorization are for flood control, however the Feasibility Studies will look at water conservation opportunities such as permanent changes to dam operations and the timing of water releases following storm events. Constraints for these studies include ongoing dam safety issues as well as the inherent flood risk in these areas with unpredictable flash flooding. The local sponsor for the Whittier Narrows Dam Water Conservation Feasibility Study is the Los Angeles County Department of Public Works. The Prado Basin Ecosystem Restoration and Water Conservation Study is a dual-purpose study that includes both aquatic ecosystem restoration and options for a change to the water control plan for water conservation year-round at a higher elevation at Prado Dam. The local sponsor for the Prado Basin study is the Orange County Water District.

Question. Does the Corps have a system-wide strategy to address water and ecosystem problems in the Sacramento—San Joaquin River Delta?

Answer. The Corps Central Valley Integrated Flood Management Study (CVIFMS) is exploring options for system-wide flood risk management and ecosystem restoration strategy in the Sacramento River Basin, the San Joaquin River Basin, and the Bay-Delta. As mentioned above, the first phase of CVIFMS focuses on the Sacramento River Basin, while the next phase would focus on the San Joaquin River Basin.

ARMY CORPS PROJECTS AND WATER SUPPLY

Question. Secretary Darcy, I understand that the Corp's primary mission is flood protection. However, there are many instances in which flood protection projects also impact other important issues like water storage and ecosystem restoration.

For example, seismic retrofits on a dam can also be used to raise the height of a dam and store more water. Better forecasting of impending storms can result in more scientific decisions on when to release water from a reservoir and when to hold it, potentially providing water supply benefits.

Secretary Darcy, how does the potential for these "win-win" type of outcomes influence the Corps' internal policies and evaluation of projects?

Answer. The Corps agrees that projects do not necessarily have to be constrained to benefit only one purpose. The Corps seeks to achieve multiple public benefits at individual projects to maximize returns on Federal, State, and local investments. The Corps has extensive experience managing reservoirs for multiple project purposes throughout the United States, but the consideration of multiple project purposes is a matter of making trade-offs. Currently, the Sacramento River General Reevaluation Report underway is investigating both flood risk reduction and ecosystem restoration opportunities in the lower Sacramento River Basin.

With regard to reservoir operations, the Corps incorporates flexibility to consider other objectives like water supply storage when applicable. The Corps has always

relied on weather forecasting as one of a wide range of factors to determine when reservoir releases should be made or held back to meet its public safety mission and other objectives. Improved forecasting has allowed the Corps to adapt and be more agile in responding to changing conditions.

The Corps water control manuals are not static, and are continuously examined to determine if revisions are necessary based on engineering manuals and regulations. In addition, especially during times of significant drought, the Corps may allow for temporary deviations of water control manuals in order to increase water supply through conservation measures. As discussed below (Question #6), the Corps has almost completed the Folsom Water Control Manual Update project for the Folsom Dam; the update incorporates the use of forecasts in flood release operations. Lessons learned at Folsom, as well as at Lake Mendocino, could inform operations at other projects, and help the Corps and its partners achieve the multiple purposes that these reservoirs serve.

The Corps will continue to consider and evaluate opportunities for multi-purpose water management strategies at both Corps-owned and operated dams and those "Section 7" dams where the Corps may not own or operate the facility but has purchased flood pool space and provides oversight in accordance with the Water Control Manual, in consultation with stakeholders, and in accordance with law and policy.

Question. Are there any legislative barriers that hinder the Corps in assisting with drought mitigation, especially in light of the ongoing investments the Army Corps is making in California water infrastructure from a flood control and ecosystem restoration standpoint?

Answer. No. There are no legislative barriers. The Corps is closely coordinating with other Federal, State, and local partners to determine how they can help support other agencies' objectives—such as water storage and supply —while operating within its defined main missions, which are flood and storm damage reduction, commercial navigation, and aquatic ecosystem restoration.

For example, 15 Federal, State, and local agencies have agreed to coordinate with one another to identify and potentially implement compatible Federal and non-Federal actions in the Yolo Bypass to achieve multiple public benefits, including flood risk reduction, fish and wildlife habitat restoration, water quality and supply improvements, agricultural land preservation, recreation.

Question. In general, what is the Corps doing to help with drought conditions in California?

Answer. The Corps has collaborated and communicated with the State, resulting in conservation measures in some California reservoirs, which, in turn, has helped to mitigate the effects of the drought on urban, agricultural, and environmental sectors.

Below are some of the Corps ongoing activities:

Water Management.—The operations manuals for many Corps dams includes a specific subset of instructions for drought conditions that allow flexibility in making flood releases from the Corps "flood control space" while the drought continues. The Corps water management team is fully engaged with other State and Federal agencies regarding operations and conditions, and is responsible for responding to deviation requests from our local water partners at Corps-owned dams. Water releases are closely coordinated and managed with local water users, power generating partners, and the Corps water management team, including times when drought conditions dictate that water releases fall below required or recommended flows.

Emergency Operations.—Under the Flood Control and Coastal Emergency Act (Public Law 84- 99, as amended), the Corps can provide emergency water assistance due to drought. The Corps has the authority to transport emergency water supplies of clean drinking water for human consumption to any locality designated as a drought distressed area. Affected localities also have the option of purchasing storage space where available at Corps reservoirs. Also, the Corps is authorized to construct wells in drought distressed areas if the option is not commercially available.

Regulatory Division.—During drought conditions, local water interests may consider temporary and permanent measures to improve water extraction such as pumps, siphons, wells, and dredging. Most activities fall under the Corps Nationwide Permit Program or the District's general permit for emergency actions, pursuant to Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.

In some emergency situations, procedures may be approved by the Corps to issue a permit more quickly following informal coordination with resource agencies. For example, the Corps expedited a permit that allowed the California Department of Water Resources to construct a large temporary drought barrier in June 2015 to hold back saltwater from the interior Delta, and thus protect its freshwater supply.

Contracting.—PL 84–99 emergency response requests typically come with a contracting component—such as contracting for emergency services, supplies, construction, or system design. Contracting Division has the authority to streamline the contracting process where appropriate. Additionally, the Corps could modify existing contracts to change water use or conservation measures at our sites.

Real Estate Division.—Where needed, the Real Estate Division is authorized to procure land or buildings that might be needed to store water for pumping or for staging water bottle distribution.

The Corps currently has a deviation to the water control plan in effect for Whittier Narrows Dam for the purpose of water conservation. Last flood season the Corps had a short-term deviation in effect for Prado Dam and the Corps is considering a request for a 5-year deviation for Prado Dam. The deviations allow the Corps to impound additional water for water conservation purposes. In fiscal year 2016, Whittier Narrows Dam conserved 1,300 acre-feet of water from the deviation. Similarly, Prado Dam conserved 7,300 acre-feet.

BENEFICIAL USE OF CLEAN DREDGE MATERIAL

Question. I understand that more than 400 ports and 25,000 miles of navigation channels are dredged throughout the United States to keep ship traffic operating efficiently. The operations and maintenance of our ports falls under the jurisdiction of the Army Corps of Engineers.

Aquatic ecosystem restoration is also a critical mission of the Army Corps. Coastal resilience projects, like wetland construction, often require additional clean sediment material. This is true in many places all along the California coastline.

It seems to me that there is an opportunity here for a "win-win" scenario by using clean material dredged from ports for ecosystem restoration projects that have a need for additional dredged material.

Secretary Darcy, does the Corps have a process for pairing up projects so that material dredged from one project can be used in a second project?

Answer. Yes. There is coordination across Corps mission areas that can reduce overall costs. The beneficial use of dredged material is considered when and where practicable. The Corps also has a Regional Sediment Management Program to establish regional management strategies and link sediment management actions at authorized Corps projects. Management activities with other Federal agencies, State, and local governments are coordinated within the boundaries of physical systems, including inland watersheds, rivers, estuaries, and the coast.

Question. Given the need for dredged material in ecosystem restoration projects, does the Army Corps currently view dredged material as a resource, rather than just as a waste product from waterways?

Answer. Yes. The Corps considers dredged material as a resource and has been using dredged material beneficially for decades. There are numerous examples of the Corps using dredged material to nourish eroding shorelines and create offshore berms to reduce wave energy and provide a sand source for littoral drift. Dredged material has also been used to create wetlands, oyster reefs, submerged aquatic vegetation, bird islands, and other aquatic habitat, as well as to restore Brownfields, cap landfills, and enrich soil for agriculture. Dredged material has even been used as a construction product. Examples include restoration of the Middle Harbor Enhancement Area using dredged material from the Oakland Harbor project; construction of the Senator Paul S. Sarbanes Poplar Island Ecosystem Restoration project with dredged material from the Baltimore Harbor & Channels project; restoration of wetlands in the Mississippi River Delta using dredged material from the Mississippi River Baton Rouge to the Gulf project; and the use of sand from many coastal projects to re-nourish beaches and reduce erosion. While many of these beneficial use alternatives can be costly, some can be accomplished as the least cost alternative.

Question. Are there any barriers to using dredge materials more productively other than cost?

Answer. There are many factors that must be considered in deciding whether or not dredged material can be used beneficially, and where the material can be placed. These include, but are not limited to, the type of material (whether it is sandy, rocky, fine- grained, etc.), whether or not there is contamination in the dredged material, the needs of any biological resources that would be benefitted, time of year restrictions for the dredging and placement activities, and type and availability of equipment required to place the material. For instance, it is not good practice to use fine-grained or contaminated material to re-nourish beaches or create oyster bars.

UPDATING DAM OPERATION MANUALS

Question. The technical decisions made by reservoir operators regarding when to release water have become particularly important during the prolonged California drought. We want to make sure that we are not wasting even a single drop of water by releasing it when we don't have to.

In California, I understand that many regions receive a large portion of their annual rainfall from intense, but geographically narrow storm events called Atmospheric Rivers.

It seems to me that if we are better able to predict these storm events and the amount of precipitation they bring, we would be able to make more informed decisions about how we operate and manage our dams and reservoirs.

I believe this is another instance of bureaucratic inertia rather than prioritization of the latest science. We must ensure that the Federal Government is actually using the latest science to make informed water decisions.

Secretary Darcy, how is the Corps incorporating the latest science regarding Atmospheric Rivers into the way it operates dams?

Answer. The Corps is closely following the latest science on Atmospheric Rivers. In operating Corps-owned dams, and in managing flood releases at Section 7 dams, the Corps has incorporated the latest science. Corps dams are designed for extreme weather events. Given the fact that the Corps dams are designed for the extreme events, the agency must also balance the needs for flood control and other authorized purposes, relying heavily on several tools to ensure that the water conservation efforts do not compromise the safety of the dam. Such tools include: (1) Weather forecasts from the National Weather Service and private weather contractors; (2) Flow forecasts from the River Forecast Center; and (3) Corps Water Management System (CWMS) numerical models that can predict the water level at the dams from forecasted precipitation.

The Corps continues to evaluate its portfolio of dams with regard to risk and vulnerability to an array of potential scenarios that might impact the overall safety of the facilities. This could be attributed to a host of factors, including extreme design events and loading scenarios, as well as hydrologic and seismic events, and pertinent maintenance challenges associated with aging infrastructure. One of the contributing factors that is evaluated is the development of inflow frequency curves that explore the full range of loading conditions (including extreme events). This will help dam operators estimate how frequently the extreme events occur at each dam and how those loading events influence decisions with respect to Federal investment strategies to address infrastructure needs. Specifically, the Corps has almost completed the Folsom Water Control Manual Update project which is incorporating the use of forecasts in the flood release operations rule set for that Section 7 reservoir.

The Corps is currently participating in a 5-year research study to investigate use of the latest science in forecasting of the Atmospheric Rivers. If promising, the results of the study could be incorporated into operation of reservoirs. The study is known as the Forecast-Informed Reservoir Operations (FIRO) research in Lake Mendocino, and it is a pilot study that would use atmospheric river (advanced hydro-meteorological) forecasting data to inform water management decisions in a manner which reflects current and forecasted conditions. The study was scoped in 2014, and began in 2015. The research is projected to be a 5-year effort, and the results may indicate whether this technology can be applied in actual operations of certain projects. The Corps is participating in this pilot project with a consortium led by Scripps Center for Western Weather and Water Extremes, along with the Sonoma County Water Agency, California Department of Water Resources and State Climate Office, Bureau of Reclamation, NOAA's National Weather Service, Earth Systems Research Laboratory, and Restoration Center, USGS, and the private sector.

Question. How does the Corps prioritize which dam operations manuals need to be updated and when?

Answer. Updates are prioritized based on several factors, such as significance of the changes to original design components, operations, hydrology, environmental changes and/or a need to evaluate proposed changes to existing water control plans, vulnerability of the populations downstream of the dam, and interest from downstream partners. Prioritization of water control manual updates must also be made alongside other competing demands within the Corps budget.

Question. What is the Army Corps' basis for refusing to accept non-Federal contributions to pay for upgrades to these flood control manuals?

Answer. The Corps can—and does—accept funding to update manuals for Corps-operated and maintained dams. Paragraph (5)(B) of Section 1046(a) in WRRDA

2014 states, "The Secretary [of the Army] may accept and expend amounts from non-Federal entities and other Federal agencies to carry out this subsection and reviews of project operations or activities resulting from those reviews." This only applies to projects that are "operated and maintained by the Secretary [of the Army]", meaning projects operated and maintained by the Corps of Engineers. Section 1046 does not allow the Corps to accept funds for projects operated and maintained by other agencies.

Question. How is the Corps ensuring that rigid water release schedules do not undermine other Federal efforts to increase water storage?

Answer. The Corps uses operational flexibility afforded by the water control manuals to store water for the longest period of time possible, helping meet the needs of partners without compromising the flood control mission. The water release schedules prescribed by the Corps consider the most recent forecasts available as well as the results of coordination with our partners. Water release schedules are reevaluated on a 6-hour basis during flood events and daily during non-flood events to ensure that changes to the reservoir, stakeholder concerns, and forecasts are appropriately considered. The Corps also has a process for deviations from control plans, outlined in "Guidance on the Preparation of Deviations from Approved Water Control Plans," Regulation No. 10–1–04, dated 18 December 2014. This allows the Corps to operate reservoirs to meet flood control requirements while considering other objectives, such as increased water storage.

Question. How has California's drought affected the Corps' management of Federal dams?

Answer. In general, the drought decreased the amount of water coming into and being stored in Corps reservoirs, which reduced the number of occasions where water was released solely for flood control reasons. It has also showcased the importance of coordination with partners, especially when the storage levels in the reservoirs entered the flood control space. Consistent communication between the Corps and its partners has helped keep all parties aware of upcoming water demands, inflow and precipitation forecasts, and changes to reservoir release schedules.

Question. When updating operation manuals, is the Corps accounting for its other missions, like aquatic ecosystem restoration, to ensure that water storage and releases benefit the California water system in multiple ways?

Answer. The Army Corps always considers its missions and the reservoirs' authorized purposes, including when updating water control manuals. The Corps works collaboratively with Federal and non-Federal partners to update water control manuals to identify and incorporate benefits for different missions, and Corps partners have opportunities to provide comments before any documents are finalized.

MERCED ARMY CORPS PROJECT

Question. Merced County, a rural county in California, has been struggling for years to complete project elements of the Merced Streams Group that was authorized in 1944. One major project element of the Merced Streams Group that is yet to be completed is a flood control system on the Black Rascal Watershed.

It is my understanding that the project has remained stalled due scarce Federal resources, delays, and errors on the part of Corps district staff.

In 2013, the Corps advised Merced County that it could use local dollars to move forward with a cost share agreement. In 2015, however, the Corps reversed its position and said only Federal funds could be used.

Secretary Darcy, can you explain the current situation with Merced County and what needs to be changed to allow them to use local dollars to advance the project?

Answer. Pursuant to the Corps' contributed funds authority (33 U.S.C. 701h), the Corps may accept such funds only if Federal funds have been appropriated for the study. That has not occurred because studies elsewhere in the Nation were considered a higher priority for the available Federal funds. In addition, the proposed work was considered in formulation of the original Merced County project authorized by the Flood Control Act of 1944 (Public Law 78–534). It was not part of the recommended plan due to concerns involving impacts to federally listed species.

QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

Question. Assistant Secretary Darcy, on February 11, 2016, I sent you a letter signed by 13 of my colleagues asking the Army Corps to finalize and publish implementation guidance for Section 2106 of the Water Resources and Development Act (WRRDA). WRRDA was signed into law in June 2014. This Subcommittee secured $25 million in funding for Section 2106 in the fiscal year 2016 Omnibus Appropria-

tions bill. And yet, the Army Corps has still not completed implementation guidance. It is critical that this is done as soon as possible so that eligible ports have access to the appropriated funding and can maximize the effectiveness of Section 2106. When do you expect to issue guidance for Section 2106? Has the Army Corps met with eligible ports to understand how Section 2106 funds could be maximized on a port by port basis?

Answer. The Corps expects to finalize implementation guidance for Section 2106 in the coming months. Individual Corps districts coordinated with eligible ports to determine how they would utilize the Section 2106 funds. In addition, the Corps Headquarters has been working to develop criteria to allocate those funds, in consultation with the American Association of Port Authorities. Corps Headquarters has also been consulting with U. S. Customs and Border Protection on how payments will be made to shippers and importers in those cases where ports elect to provide those payments.

Question. Congress created Section 2106 so that donor ports and energy transfer ports can better address competitiveness by maintaining infrastructure through expanded uses and environmental remediation and by establishing a rebate program for importers and shippers to reduce cargo diversion to non-U.S. gateways. It is critical that the Army Corps provide ports the necessary flexibility to target the rebate program to cargo that is most at risk of diversion to non-U.S. ports. How will the Army Corps work with eligible ports to address cargo diversion? With respect to infrastructure improvements through expanded uses and environmental remediation projects, how will the Army Corps ensure eligible ports can define project parameters and contract the work themselves to ensure timely and cost effective project delivery?

Answer. Section 2106 specifies that payments may be provided to importers entering cargo or shippers transporting cargo through that port. The Corps has no authority to provide ports the flexibility to target the rebate program to cargo that is most at risk of diversion to non-U.S. ports. The Corps will issue implementation guidance and work with the ports to define the process and infrastructure improvements under expanded uses and environmental remediation projects, whether the ports decide to perform the work themselves or have the Corps perform the work for them.

Question. Washington State is the leading shellfish producing State in the Nation, employing over 2,700 people around the State, including in rural areas. The Army Corps, through the Seattle District, regulates the shellfish industry under Clean Water Act and Endangered Species Act authorities. In 2007, the Army Corps adopted Nationwide Permit 48 (NWP 48) to permit existing shellfish farms, and an updated NWP 48 was adopted in 2012 to cover shellfish farms through March 2017. Since 2007 and the initial NWP 48, Washington growers have submitted approximately 1,000 requests for NWP 48 verification. I am very concerned by reports that none of these requests have been approved.

The commercial shellfish industry contributes over $184 million annually to the Washington State economy, and shellfish are important economically and culturally to tribal and non- tribal harvesters. In all industries, including shellfish growing, certainty for participants is important for success. I understand that the Army Corps is working with Federal partners, including the National Marine Fisheries Service and U.S. Fish and Wildlife Service, to complete action on Endangered Species Act permitting requirements through a Programmatic Biological Assessment. Can you provide me with an update on when this process will be completed? How does the Army Corps plan to communicate with the regulated community as the Programmatic Biological Assessment is being finalized and once the regulations have been implemented on how they can obtain verifications?

Answer. At this time, a Section 7 ESA consultation is underway between the Corps and the National Marine Fisheries Service and U.S. Fish and Wildlife Service (the Services) for aquaculture activities. This consultation is the result of several years of coordination among the Corps and the Services. Once this consultation is completed, many activities with pending requests for verification under NWP 48 may be verified. Any automatic verification of the pending projects before completion of this consultation would not be compliant with the Endangered Species Act or the "endangered species" general condition for the NWPs. Both the Services have indicated they will complete their consultations this spring.

Question. I also understand the Army Corps is reviewing options to update regulations of shellfish growers under the Clean Water Act. As this effort continues and potential pathways are explored, can you share your plan for communication and engagement with interested stakeholders, including the State of Washington, Federal agencies, shellfish growers, and tribes? Increased transparency and communication with interested parties, including explanations of regulatory authority under

the Endangered Species Act and Clean Water Act, are of great interest to me and I ask that you submit an update and expected timelines on these efforts to me in writing.

Answer. Following receipt of the final Biological Opinions, the Corps' Seattle District intends to host an open house to explain to shellfish growers and all other interested parties the conditions of the Biological Opinions and the next steps for the pending applications.

Question. The Amy Corps, through the Northwest Division, plays an important day-to-day role in implementing the Columbia River Treaty as a member of the U.S. Entity. The U.S. Entity engaged in a multi-year process with tribal nations and domestic stakeholders throughout the Pacific Northwest to reach a regional consensus to modernize the Columbia River Treaty. The "Regional Recommendation for the Future of the Columbia River Treaty after 2024" was presented to the Administration in December 2013, and the Administration has since developed a high-level consensus position for negotiations with Canada based upon these recommendations.

Twice the entire Northwest Congressional Delegation wrote the Administration asking to begin formal negotiations with Canada. Unfortunately, we keep being told negotiations could begin soon and little progress has been made.

Assistant Secretary Darcy, my constituents are greatly concerned about the impacts a change in Administration may have on these negotiations. I urge you to encourage the Administration to begin formal negotiation with Canada as soon as possible.

Answer. The U.S. Army Corps of Engineers, Northwestern Division Commander, as a member of the U.S. Entity for the Columbia River Treaty, has informed the Department of State that the U.S. Entity is ready to support and assist in the negotiations with Canada on the future of the Columbia River Treaty.

Question. Assistant Secretary Darcy, as we have previously discussed, the Mud Mountain Dam project is of great importance to me, my constituents, and Washington State. I appreciate the time and energy you have put into finding a path forward with NOAA to ensure the Army Corps meets its Endangered Species Act and tribal trust responsibilities by replacing the diversion dam and building a new fish trap facility.

While I am pleased that the fiscal year 2017 budget request provides $22.35 million and a construction new start for Mud Mountain Dam, I firmly believe this project is not a new start. Similar projects have not been subject to this hurdle, for example the Columbia River Fish Mitigation and Missouri River Recovery Program projects. Replacing the old barrier structure and fish trap facility is a continuation of the Army Corps' Endangered Species Act and tribal trust responsibilities and are simply requirements to mitigate the original construction and ongoing operation of Mud Mountain Dam for flood control.

Assistant Secretary Darcy, how is the Mud Mountain Dam project different than the Columbia River Fish Mitigation or Missouri River Recovery Program? Can you explain why a Biological Opinion which will bring an existing Army Corps project into compliance is a new start? Further, I ask that you work with me to ensure there are no funding gaps for this critical project if Congress passes a Continuing Resolution before a full-year fiscal year 2017 appropriations measure.

Answer. Multiple construction actions have been occurring over numerous years on the Columbia and Missouri in an effort to mitigate the impacts of ongoing operation of Federal projects to threatened and endangered species and their habitat, while at Mud Mountain Dam the plan is to initiate new construction to replace a 100-year old facility. The Mud Mountain Dam was determined to be a new start due to the scope and cost of this new investment.

QUESTIONS SUBMITTED BY SENATOR RICHARD J. DURBIN

Question. After many years of strong support from the Army Corps, there was no funding for continuation of construction of the McCook Reservoir of the Chicagoland Underflow Plan in the Administration's fiscal year 2017 Budget. The project was authorized in 1988, and the Army Corps' own documentation since then shows that it has always been considered one flood protection project, and it has consistently received funding. The reservoir provides $100 million in annual benefits to 3.1 million people in 37 counties, including the City of the Chicago. It is 65 percent complete, and enjoys a three to one benefit cost ratio. Stopping construction of this project does not make sense.

Why was funding discontinued in the President's budget? Will you commit to seeking its inclusion in the Army Corps' fiscal year 2017 work plan?

Answer. The 2016 Corps work plan added $5 million above the Budget level in order to provide the full amount that the Corps estimated it would need to complete "Stage I" of the McCook Reservoir project. The December 2011 consent decree with EPA and the Department of Justice requires the Metropolitan Water Reclamation District of Greater Chicago (MWRD) to ensure that the first of two McCook Reservoirs is in operation by December 31, 2017. The focus of the Corps funding to date has been to help MWRD meet its December 31, 2017 deadline by constructing part of the infrastructure called for in the consent decree. The Corps has now funded all of the authorized Federal share of that work, which will enable MWRD to collect and hold combined sewer overflow in this reservoir during a storm.

The 2017 Budget does not include funding for "Stage II" of the McCook Reservoir project. Should the Congress provide additional funding for which this project would qualify, this project would be considered for funding in the 2017 Corps work plan along with other programs, projects, and activities across the Nation in competition for the available Federal resources.

Question. Investment in flood prevention in the Metro East region, including protecting our levees, is vital to protecting Metro East communities.

Will the Assistant Secretary commit continued open dialogue with the local Flood Prevention District? Will the Assistant Secretary commit to providing regular updates to me or my staff as they happen?

Answer. The Metro East levee system consists of 75.8 miles of levees located in Madison, St. Clair, and Monroe Counties in Illinois. The Corps is working on this project with the Southwestern Illinois Flood Protection District Council (FPD) and the local levee districts to reduce the risk of under-seepage at these levees. The Corps welcomes the views of all interested parties, including the FPD, the local levee districts, and the public. Should the FPD or the local levee districts have any questions or concerns, they may contact the Corps at the district office, division, or headquarters levels, or my staff. The Corps provides periodic updates to my office on this project. I would be happy to work with you and your staff as well, in order to help keep you informed of the project status.

QUESTIONS SUBMITTED TO LIEUTENANT GENERAL THOMAS P. BOSTICK

QUESTIONS SUBMITTED BY SENATOR JAMES LANKFORD

Question. Section 1024 of WRRDA provides that the Corps can accept materials and services from a non-Federal entity in an emergency situation if the Secretary deems it to be in the public interest. Considering maintenance needs of Corps assets system-wide, this would seem to be a good opportunity to leverage stakeholder resources. It is my understanding that this section has not yet been implemented.

Does the Corps have draft implementation guidelines yet? Could we have a copy?

Answer. The Corps is currently preparing implementation guidance for Section 1024 of WRRDA 2014.

Question. Has this information been shared with stakeholders that depend on waterway systems to ensure it is workable from the private partner perspective?

Answer. The Corps has discussed this provision with interested stakeholders. Their input is being taken into consideration during the preparation of the implementation guidance.

Question. How does the Corps interpret "emergency"? With substantial maintenance needs across the system, it is very possible that failures could occur outside of a situation in which there is an emergency declaration. Would these types of failures be eligible for private repair funding?

Answer. Section 1024 authorizes the acceptance of materials and services to repair, restore, or replace a water resources development project that has been damaged or destroyed as a result of an emergency. Section 1024 is not limited to situations where there has been an emergency declaration by the President.

The Corps does not view Section 1024 as allowing the Corps to accept services or materials to address general repair and maintenance needs. However, the Corps is authorized under 33 U.S.C. 701h to accept contributed funds from non-Federal public entities and from nonprofit entities, with the consent of the affected local Government, for that purpose.

Question. Has the Corps settled how to handle issues regarding who liable for damage or injuries caused during emergency repairs using private funds? Do you have all the authority you need to settle questions over liability and licensing?

Answer. Yes, we have all the authority needed to resolve questions over liability and licensing. Based on discussions with stakeholders, we expect to be able to address this concern.

Question. What is the timeline for having guidelines in place and allowing private partners to assist with emergency repairs?

Answer. This guidance is being developed and we anticipate issuing it later this year.

Question. Stakeholders in Oklahoma have expressed an interest in allowing assets to be used by the Corps at no cost, but have been told that regulations prohibit them from accepting use of resources. For instance, private entities may have a dredge that they would like to offer to the Corps to use upon request. What is the rationale for not accepting this assistance?

Answer. In general, the Corps needs specific authority to use equipment being provided at no cost, rather than obtaining such equipment using Federal procurement authorities and regulations. We anticipate the Corps would in many cases be able to accept and use a dredge provided for the purpose of repairing or restoring a project damaged or destroyed as a result of an emergency under Section 1024, but cannot answer more specifically until the implementation guidance is issued.

Question. In the 2014 reauthorization of the Water Resources Reform and Development Act (WRRDA), Congress included a provision requiring the Corps to conduct an assessment of all of their properties to determine which are "not needed for the mission of the Corps of Engineers" (Section 6002). The intent of this language was to assess how Congress could help unburden the Corps from the considerable backlog in maintenance needs.

In the hearing, it was stated that the Corps has not yet started this assessment. When will this task be undertaken? When can we expect to see the draft report? When can we expect to have the final report?

Answer. Implementation guidance for Section 6002 of WRRDA 14 was issued on August 7, 2015. The Corps periodically reviews the need for the Federal properties at its projects and uses existing property disposal methods for those properties if they are no longer needed to accomplish the agency mission. These efforts are ongoing.

Question. The Corps has previously shared that the disposal process for unneeded properties is so cumbersome and costly that it is often easier and less expensive in the short run to simply maintain unneeded assets. Would granting the Corps disposal authority independent of GSA assist in making the disposal process more manageable? What does the Corps need from Congress to be able to divest of unneeded assets in a cost-effective manner?

Answer. Generally, GSA is responsible for the disposal of real property that is no longer mission-critical to Federal agencies. This authority works well for land and general use improvements. In some cases, the Corps will seek to dispose of lands associated with a project as part of an effort to deauthorize the project. In those cases, the Corps generally would perform a study and seek deauthorization of the project prior to submitting the disposal package to GSA. These studies evaluate environmental concerns, safety concerns and the concerns of non-Federal interests. New processes are now in place to reduce the time required to fund, study and make recommendations as appropriate addressing the proposed end state of the project. To further reduce the timeline, future studies will include a recommended disposal plan, where feasible, for Congressional consideration.The 2016 Corps work plan and the 2017 Budget included funding for studies on the disposition of assets that no longer have a strong Federal interest; the Corps has completed the first of these studies and is preparing to start five more in 2016.

Question. The Corps was directed to produce a list of at least $18b in projects that are eligible for deauthorization because a significant amount of time has lapsed without getting funded. This list was produced in October of last year and found a sizable—$14b—amount of old, unfunded projects. An earlier report from GAO found that the Corps does not have written guidance for their districts requiring them to track studies and projects that have been authorized but not funded, leading to incomplete information regarding projects that may be eligible for deauthorization.

Has the Corps provided a written policy for districts to follow regarding cataloging all authorized projects and studies? If it has not, when will an internal policy setting how to track this information be set? Will the Corps then reassess the deauthorization list?

Answer. Yes, the Corps provided written implementation guidance to its divisions and districts for Sections 6001 of the Water Resources Reform and Development Act of 2014 and Section 1001 (b)(2) of the Water Resources Development Act of 1986, as amended. The Corps is developing an authoritative database for authorized projects and will use it to provide the Backlog Report and annual Minimum Funding Lists in accordance with Section 6001. As projects are identified for deauthoriza-

tion eligibility they will be included in future annual deauthorization processes consistent with amendments to Section 1001 (b)(2).

The Corps is currently developing written guidance for deauthorizing studies in accordance with Section 710 of WRDA 1986, and is developing an authoritative database of studies to support this effort.

Question. Does the list published in the Federal Register in October 2015 reflect information gathered from all of the districts?

Answer. Yes, the list published in the Federal Register in October 2015 reflects information gathered from all of the Corps districts.

QUESTIONS SUBMITTED TO ESTEVAN R. LÓPEZ

QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

Question. Please explain why the Bureau of Reclamation (Reclamation) did not require any new data in 2004, when it changed the Technical Memorandum and currently does not require data regarding the performance of steel water pipe or ductile iron pipe with bonded dielectric coatings in highly corrosive soils but requires significant data regarding other corrosion protection methods for ductile iron pipe.

Answer. Reclamation prepared the Technical Memorandum (TM) in response to Congressional direction received in 2003 (H.R. REP. NO. 108–212, at 106) (2003),[1] and it was first published in 2004. The data as well as the recommendations in the TM encompass all types of buried metallic pipe. Reclamation's technical staff reviewed and evaluated industry standards, national consensus standards, independent engineering studies, and performance data from Reclamation projects as well as other Federal and non-Federal pipeline owners and water utilities. Reclamation also met with representatives from the Ductile Iron Pipe Research Association (DIPRA) in May of 2003 and January of 2004 to discuss technical issues and literature regarding corrosion mitigation of ductile iron pipe prior to publication of the TM. Reclamation also indicated that any other information DIPRA wished to provide would be welcomed.

Reclamation evaluated the technical content of the available literature, the thoroughness of the analyses, the reasonableness of the conclusions, and finally, the likely objectivity of the author(s). Reclamation then used its best technical judgment to perform what we believe is a balanced assessment of the available information and to develop a reasonable set of recommendations designed to meet Reclamation's 50-year minimum project service life.

During this evaluation, Reclamation found a number of respected studies which raised significant technical concerns regarding corrosion under unbonded dielectric coatings, including polyethylene encasement (PE). Reclamation also found that the effectiveness of PE had been the subject of debate within the pipeline and corrosion industries for years and that the results of engineering studies on the subject differ widely. In addition, Reclamation found that many professionals in these industries question the effectiveness of a cathodic protection system to counter the effects of corrosion under intact PE.

As a result of that review, Reclamation concluded that many corrosion engineers believe that buried pipes, which need a high level of corrosion protection, should have a bonded dielectric coating and cathodic protection. This conclusion is supported by the National Association of Corrosion Engineers' (NACE) International Standard Practice SP0169 "Control of External Corrosion on Underground or Submerged Metallic Piping Systems".

During its evaluation of these analyses and data, Reclamation balanced these technical concerns against the relatively good performance record of ductile iron pipe with PE and recommended the use of PE on all sizes of ductile iron pipe in all but the most severely corrosive environments (i.e. soil resistivity $\leq$2000 ohm-cm).

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[1] The relevant text from the House Report states: "The Committee is concerned that the Bureau of Reclamation is not adhering to its guidelines, described in the "Corrosion Prevention Criteria and Requirements", with respect to the use of ductile iron pipe and steel pipe. With respect to both products, the Bureau of Reclamation should be attempting to establish good engineering practices which address the long-term value and cost effectiveness of facilities constructed over time. The Committee recognizes that additional work is needed to develop a more definitive corrosion standard on which to decide the best product for a particular application. Accordingly, the Committee directs the Commissioner of Reclamation to conduct a study on the current corrosion criteria and to report to the Committee on Appropriations by March 1, 2004, on its recommendations for a more definitive standard. Until a more appropriate standard is in place, which reflects the basic principle of long-term cost effectiveness, the current criteria should continue to be used."

In those severely corrosive environments, bonded dielectric coating and cathodic protection (CP) was recommended for all metallic pipe types (including ductile iron pipe).

Based on this work, Reclamation prepared a draft of the current TM and sought review from a variety of sources. Reclamation employed a Consultant Review Board (CRB) to conduct an independent technical peer review of Reclamation's draft TM. To staff the CRB, Reclamation contracted with two private sector corrosion engineers from CH2M Hill and Schiff and Associates, as well as a materials scientist with the National Institute of Standards and Technology (NIST). In addition, a contract was issued for two additional materials scientists with NIST to serve as independent "referees" to evaluate the three reviewers' conclusions. After incorporating the CRB's input, the updated draft TM was sent out for Reclamation-wide review in May, 2004.

In July, 2004, Reclamation met with representatives of DIPRA to discuss the Design Decision Model (DDM) for selection of a corrosion control system on ductile iron pipe which DIPRA had developed in concert with CORRPRO (a large corrosion control company). Reclamation's process to evaluate the information in DIPRA's presentation was the same process used to evaluate all other technical reports we reviewed in preparation of the TM (i.e., Reclamation evaluated the technical content of DIPRA's presentation, the thoroughness of the analyses presented, the reasonableness of the conclusions, and finally, the likely objectivity of the author(s)). The comments from the Reclamation-wide review and DIPRA's input were incorporated, and the TM was finalized later in July, 2004.

Reclamation has remained actively engaged in this issue since the 2004 TM was issued. We continue to monitor technical literature on this subject and actively seek additional viewpoints from other organizations. Through these efforts, we have discovered many other organizations have concerns with the use of PE on ductile iron pipe. These organizations include non-Federal water resource agencies and other Federal agencies such as the Department of Transportation (DOT), Department of Defense, the Environmental Protection Agency, and the U.S. Army Corps of Engineers. Reclamation continuously seeks information on this issue by having its technical staff serve on national technical society committees such as the American Water Works Association (AWWA) Standards Committee A21 "Ductile Iron Pipe" and the NACE International Task Group 014 "Corrosion and Corrosion Control for Cast-and Ductile-Iron Pipe."

In the judgment and expertise of Reclamation, the technical positions outlined in the TM are fundamentally sound and represent a reasonable position in light of the available data, industry standards and practice, and scientific understanding of the issues. The 2008–2009 National Academy of Science's (NAS) review of the TM concluded that ductile iron pipe with PE and CP is not likely to provide a reliable 50-year service life in severely corrosive soils ($\leq$2,000 ohm-cm) and bonded dielectric coating with CP would be more effective. In reaching this conclusion, the committee evaluated data from all sources, including the DOT data provided by Reclamation and the data and analysis provided and presented by DIPRA.

The NAS report confirms Reclamation's concern with the durability of ductile iron pipe with polyethylene encasement and cathodic protection installed in severely corrosive soils. Also, while the NAS committee could not assure that Reclamation's recommended corrosion protection system (bonded dielectric coating with cathodic protection) would provide a reliable 50-year service life for ductile iron pipe installed in these soils, the report does state that this system substantially improves the chances of achieving this level of reliability.

Reclamation agrees the collection of additional performance data recommended by the NAS committee will be beneficial as the agency seeks to refine its technical position in an updated TM. Reclamation has awarded a Grant Agreement to collect and compile water pipeline field performance data to Virginia Polytechnic Institute and State University (Virginia Tech). This agreement has a completion date of December 31, 2017.

During a July 2015 meeting between Reclamation, and representatives from the ductile iron pipe industry, DIPRA proposed that Reclamation change its corrosion prevention criteria for ductile iron pipe in soils having resistivity values equal to or less than 2,000 ohm-cm from bonded dielectric coating and cathodic protection, to a zinc metallizing with enhanced polyethylene encasement (V–BIO) and cathodic protection. Following the meeting, DIPRA provided several documents to support their position that their proposal would perform well in severely corrosive soils.

Reclamation's review of the submitted data focused on ascertaining the data covering field performance of zinc coated ductile iron pipe in severely corrosive soils. However, the majority of the supplied data was in reference to the use of conventional polyethylene encasement to protect ductile iron pipe in corrosive soils. Of the

few documents submitted in support of zinc coated pipe, the majority of them were very old references published in the 1970s and 1980s that provided limited performance data. Also, none of the documents addressed the long-term performance of enhanced PE (V–BIO), and none addressed the performance of the proposed combination of zinc metallizing, V- BIO, and cathodic protection. Based on this review, Reclamation concluded that while zinc or zinc with PE may provide some improvement over bare pipe or pipe with PE wrap alone in some soils, there is no evidence that this system will provide the same level of long term protection as a bonded dielectric coating with cathodic protection in severely corrosive soils.

The fiscal year 2016 Consolidated Appropriations Act (PL 114–113) directed Reclamation to contract with one of the Department of Energy's (DOE) national laboratories with expertise in materials and corrosion disciplines to develop performance data for zinc-coated ductile iron pipe applications in highly- or severely-corrosive soils. The laboratory will also independently evaluate and recommend, based on the performance data and any other relevant data or information the laboratory may obtain, whether the material meets the corrosion protection requirements in the TM. On May 11, 2016, Reclamation awarded an Interagency Agreement to DOE's Oak Ridge National Laboratory to perform this study.

Question. Is it Reclamation's position that data is not required for a method of corrosion protection if there is a national or international standard for that method of corrosion protection?

Answer. Yes, Reclamation uses national consensus standards to guide its technical decisions where the use of those standards is practicable. Where those standards do not exist, do not address Reclamation's technical needs, or conflict, Reclamation develops its own internal technical documents to guide the development of designs for Reclamation designed and/or funded projects. It is Reclamation's position that methods and practices contained in a national standard have more weight than methods that are provided for information only and specifically identified as not being a part of the national standard.

—For example: The NACE International Standard Practice SP0169, "Control of External Corrosion on Underground or Submerged Metallic Piping Systems," presents acknowledged practices for the control of external corrosion on buried or submerged steel, cast iron, ductile iron, copper, and aluminum piping systems. Section 5.1.2.3 states: "Pipeline external coating systems shall be properly selected and applied to ensure that adequate bonding is obtained. Unbonded coatings can create electrical shielding of the pipeline that could jeopardize the effectiveness of the CP system." (PE is an unbonded coating.)The AWWA Standard C105 "Polyethylene Encasement for Ductile- Iron Pipe Systems" is a material and installation standard. Appendix A of that document provides a method to determine if PE should be used for corrosion protection of ductile iron pipe systems, butis specifically identified as not a part of the ANSI/AWWA C105/A21.5 standard.

Question. Based upon significant concerns, Congress has included directives to Reclamation for 5 years regarding its Technical Memorandum. Among the concerns are that Reclamation is holding different materials to different standards and increasing project costs. In addition, Congress noted in the fiscal year 2014 Consolidated Appropriations Act Explanatory Statement for Energy and Water that "[y]et another claim that Reclamation has always been in compliance and no changes are necessary is not a satisfactory response." Please provide the changes that Reclamation has made in the implementation of the Technical Memorandum and in the treatment of different materials to address these concerns.

Answer. The TM's corrosion control recommendations for both steel and ductile iron pipe in severely corrosive soils are the same—bonded dielectric coating with CP.

Reclamation uses the Technical Memorandum as a starting point for its decisions relative to the corrosion protection of buried metallic pipe, but it considers other factors and resources for its technical decisions related to corrosion protection. Reclamation relies on site-specific design data such as soil chemistry, national standards (e.g. NACE SP0169 and ANSI/AWWA C105/A21.5), and engineering judgment to guide decisions on the design of corrosion mitigation measures for Reclamation's buried metallic pipelines. The appropriate usage of the TM was reinforced by a February 24, 2010 memorandum from Reclamation's Deputy Commissioner—Operations to Reclamation's Leadership Team.

To allow additional flexibility in the application of the TM, Reclamation policy provides a process by which a deviation from design criteria and engineering and technical standards can be vetted and approved by the local Reclamation executive. This process, as it relates specifically to requests to deviate from the corrosion mitigation design criteria in the TM, was clarified by a March 13, 2015 memorandum

from Reclamation's Deputy Commissioner—Operations to Reclamation's Leadership Team.

Question. Please list any and all standards of evaluation (viability, betterment, etc.) that Reclamation has used to evaluate the various materials and methods of corrosion control in the Technical Memorandum from 2003 until today. Please provide the year, standard and type of material/corrosion protection.

Answer. Reclamation does not use a "betterment" standard for corrosion control of buried metallic pipe. Reclamation has identified a target performance level of zero external corrosion induced leaks/ruptures/failures which would require the pipeline to be taken out of service during the minimum service life (i.e. 50 years) for the pipelines Reclamation designs and/or funds. Reclamation believes that the target performance level is reasonable in light of the types of pipelines that it typically constructs, but one which may not always be achieved due to a variety of factors including unseen imperfections and the number of variables involved with pipe installation in the field. The materials used and the type of corrosion protection needed varies depending on design parameters and soil conditions in the installation area.

Question. Please provide any and all performance standards that Reclamation has used to evaluate the various materials and methods of corrosion control in the Technical Memorandum from 2003 until today. Please provide the year, standard and type of material/corrosion protection.

Answer. Reclamation has identified a target performance level of zero external corrosion induced leaks/ruptures/failures which would require the pipeline to be taken out of service during the minimum service life (i.e. 50 years) for the pipelines Reclamation designs and/or funds. Reclamation believes that the target performance level is reasonable in light of the types of pipelines that it typically constructs, but one which may not always be achieved due to a variety of factors including unseen imperfections and the number of variables involved with pipe installation in the field. The materials used and the type of corrosion protection needed varies depending on design parameters and soil conditions in the installation area.

Question. Reclamation has acknowledged that some adjustment is necessary for the performance figures for "significant incidents" for oil and gas pipelines in soils of unknown corrosivity in the 2008 National Academies of Science report to provide a more accurate comparison with ductile iron water pipe with polyethylene encasement in highly corrosive soils. Please provide those adjustments and the basis for those adjustments.

Answer. The noted text is taken from Section 4 of the 2009 NAS Report which concluded that ductile iron pipe with PE and CP is not likely to provide a reliable 50-year service life in severely corrosive soils ($\leq$2,000 ohm-cm) and a bonded dielectric coating with CP would be more effective. At the start of the NAS Committee's deliberations, they asked Reclamation to provide a quantitative benchmark against which they could measure the performance of ductile iron pipe installed in severely corrosive soils with PE and CP, in lieu of Reclamation's stated target performance level of zero external corrosion induced leaks/ruptures/failures which would require the pipeline to be taken out of service during the minimum service life (i.e., 50 years).

Specifically they asked if Reclamation would accept a similar failure rate for ductile iron pipe installed in severely corrosive soils with PE and CP, as they would get from steel pipe installed in severely corrosive soils with a bonded dielectric coating and CP. Reclamation responded that this would be a reasonable benchmark which led to the NAS Committee requesting information on Reclamation's experience related to the performance (i.e., failure rates) of steel pipe installed in severely corrosive soils, with a bonded dielectric coating, and cathodic protection. In response to this question, Reclamation conducted a review of available data on Reclamation's and other organizations' pipelines.

During this review, Reclamation reached out to the U. S. Department of Transportation (DOT), Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety, to see if they had the quantitative performance data requested by the Committee. Reclamation acknowledges that this data was related to steel pipelines carrying materials other than water, but believes the causes and rates of external corrosion and protection against such corrosion are the same regardless of the product being carried. Reclamation therefore concluded that the DOT database was the best source of quantitative data on this issue at that time.

Reclamation focused their review of the significant incidents tracked in the database to those pipelines that most closely matched the Committee's interest (i.e., coated steel pipe installed with cathodic protection) and, like most of Reclamation's projects, were transmission lines versus smaller distribution lines. Reclamation also limited their review to significant incidents that were caused by external corrosion.

Focusing on this subset of data within DOT's database, Reclamation was able to compute an average annual failure rate for these pipelines of 0.0000444 failures per mile per year (based on about 93,000 miles of installed steel pipe). Using the results of this analysis, a 450-mile long steel pipeline installed with coating and cathodic protection could be expected to experience one failure due to external corrosion during the first 50 years of service.

The DOT database does not include information on the soil conditions in which the pipelines are installed, so Reclamation was not able to further screen the data to include only pipe installed in severely corrosive soils. At that time, Reclamation noted that it was not able to quantify the impact this issue would have on the calculated performance data noted above, but some adjustment to the computed failure rate may be warranted to compensate for this uncertainty in soil conditions across the data set. However, as Reclamation also noted, even with an adjustment to the computed failure rate, it believed the analysis supported their original response to the Committee's question of what Reclamation defines as reliably providing a minimum service life of 50 years for our pipelines.

The data gathering and analyses currently being planned pursuant to the grant agreement awarded to Virginia Tech to collect and compile water pipeline field performance data should provide more useful data.

Question. Please explain why Reclamation used the performance of oil and gas pipelines in soils of unknown corrosivity as a proxy for the performance of steel water pipe in highly corrosive soils in a life cycle analysis when Reclamation had data regarding steel water pipelines in highly corrosive soils at the time it used the oil and gas data.

Answer. The life cycle analysis was conducted in August 2009 using best available data at the time. As stated in Commissioner Connor's letter to DIPRA dated January 29, 2010, "Our analysis showed the present worth of these additional capital costs for CP along with the additional OM&R costs associated with long term operations of the CP system was about 5 percent of the total project cost. Thus, the life cycle cost of a cathodically protected ductile iron pipeline with polyethylene encasement was about 5 percent higher than the life cycle cost for a similarly protected steel pipeline with a bonded dielectric coating. A summary of these analyses is shown in Attachment 3." Referring to Attachment 3, Scenario 3 which removes pipe repair costs from the analysis, the life cycle cost of a cathodically protected ductile iron pipe with polyethylene encasement was calculated to be 4.7 percent higher than the life cycle cost for a similarly protected steel pipe with a bonded dielectric coating. Reclamation's conclusion from their life cycle analysis is independent of pipe repair costs.

The data gathering and analyses currently being planned pursuant to the grant agreement awarded to Virginia Tech to collect and compile water pipeline field performance data will provide the foundation for assessing life cycle costs on a broader basis.

Question. In the same life cycle analysis, Reclamation used the failure of one ductile iron water pipeline in highly corrosive soils as a proxy for the performance of ductile iron pipe in highly corrosive soils when Reclamation had aggregate data regarding ductile iron pipelines in highly corrosive soils. Why did Reclamation use the single data point instead of the aggregate data?

Answer. The life cycle analysis was conducted in August 2009 using best available data at the time. As stated in Commissioner Connor's letter to DIPRA dated January 29, 2010, "Our analysis showed the present worth of these additional capital costs for CP along with the additional OM&R costs associated with long term operations of the CP system was about 5 percent of the total project cost. Thus, the life cycle cost of a cathodically protected ductile iron pipeline with polyethylene encasement was about 5 percent higher than the life cycle cost for a similarly protected steel pipeline with a bonded dielectric coating. A summary of these analyses is shown in Attachment 3." Referring to Attachment 3, Scenario 3 which removes pipe repair costs from the analysis, the life cycle cost of a cathodically protected ductile iron pipe with polyethylene encasement was calculated to be 4.7 percent higher than the life cycle cost for a similarly protected steel pipe with a bonded dielectric coating. Reclamation's conclusion from their life cycle analysis is independent of pipe repair costs.

The data gathering and analyses currently being planned pursuant to the grant agreement awarded to Virginia Tech to collect and compile water pipeline field performance data will provide the foundation for assessing life cycle costs on a broader basis.

QUESTIONS SUBMITTED BY SENATOR DIANNE FEINSTEIN

Question. Commissioner López, I am concerned that Reclamation has pumped less water in 2016 during this El Niño year than it did in 2015, when California was in extreme drought. Flows were as high as 50,000 cubic feet per second in the Sacramento River, yet the agencies reduced pumping to the low-end of the biological opinions because of one smelt.

I continue to hear that water pumping decisions are still being based on when protected fish might be near the pumps rather than when we know they actually are present. For example, Interior may reduce pumping if even one smelt is found as far away as 17 miles from the pumps near a monitoring station called Prisoner's Point.

But outside biologists and scientists believe that Reclamation is reducing pumping prematurely. These experts believe that the agencies could continue with higher pumping levels even if smelt are found at a monitoring station that is only 12 miles from the pumps.

What are you doing to test whether or not smelt identified past the Prisoner's Point monitoring station can still survive and make their way back out to the central Delta?

Answer. Addressing this issue is challenging and would require tagging and marking studies similar to those conducted on salmonids. Until very recently, tags small enough to use in smelt have not been available/tested. The use of such technology to evaluate the movements of wild or other smelt in the Delta is needed, but as far as we are aware is in the planning stages only.

Reclamation is participating in efforts to apply this technology to the study of smelt movement and survival in the southern Delta. Projects stemming from the following proposal are ongoing with some of the work soon to be published in a leading journal:

> Assessing Tagging-Related Mortality and Tag Retention in Adult Delta smelt to Support Field Investigations in Clifton Court Forebay and the Skinner Fish Facility (Grimaldo et al.—SFCWA Research Grant Proposal)

Due to the threatened and endangered status of the salmonid species in the Delta, most tagging/marking studies involving salmonids use hatchery produced specimens and not wild fish. The Delta smelt population is currently not augmented via hatchery-produced specimens. In addition, the use of wild smelt for such studies would be problematic due to the endangered status of the species and its population levels, which are currently at an all-time low. Efforts to identify individual wild fish by unique physical markings and characters are ongoing and may have applicability to Delta smelt in the future.

Question. If you aren't doing this monitoring, can you start doing it with some of the $100 million in drought funding from December's Omnibus appropriations bill?

Answer. If the monitoring work is conducted during fiscal year 2017, current drought funding could be used to fund studies focused on developing and applying methods to determine smelt movements and survival in the southern Delta. Efforts are being made in this area.

Question. What is the Bureau of Reclamation doing to address other threats to smelt, such as ammonia from sewage discharges and predation by other species?

Answer. Since 2010, Reclamation funded studies that address ammonia loading and its potential effects on Delta smelt and the Delta ecosystem. There is no evidence of acute ammonia toxicity to Delta smelt or any other fish in the Delta. Some studies indicate the possibility of chronic effects in larval Delta smelt and their copepod prey when exposed to high concentrations under laboratory conditions. Some earlier research suggested that ammonium may inhibit diatom production in Suisun Bay under certain combinations, but recent does not support this hypothesis. Ammonium, may degrade delta smelt habitat by favoring Microcystis, a potentially toxic form of phytoplankton. The Sacramento regional wastewater treatment facility, one of the sources of ammonium loading to the Delta, is upgrading its plant to advanced tertiary treatment methods and completion is expected by 2020. This action will eliminate almost all of its contribution to Delta ammonium loading.

Predation is a common natural interaction within ecologic communities and occurs at some level for a multitude of fish species. Reclamation continues to support research related to predation, including several specifically focused on predation of Delta smelt.

Question. How is the Bureau of Reclamation working with other Federal agencies, like National Oceanic and Atmospheric Administration (NOAA) Fisheries and Fish and Wildlife Service, to develop and implement system-wide capabilities to monitor and track fish migrations into and out of the Delta?

Answer. Reclamation has and continues to provide funding to NOAA Fisheries and the Fish and Wildlife Service (FWS) to monitor and track ESA-listed fish species, both in and out of the Delta. Reclamation continues to work with a consortium of multiple agencies (including NOAA Fisheries and FWS) within the framework of the Interagency Ecological Program and beyond to monitor and track fish in the Delta. Over twenty separate monitoring activities within this program occur year-round, but with increased effort from fall through early summer.

Beyond their ongoing tracking, Reclamation has provided FWS with $3.8 million this year to fund additional studies, including whether the viability measuring point can be moved from the current 17 mile marker at "Prisoner's Point." This study will take several years. To date, however, FWS maintains the measuring point at "Prisoner's Point."

Additionally, Reclamation's Tracy Fish Collection Facility has one of the most extensive long- term monitoring programs within the Delta, sampling every 2 hours on a continual basis. Monitoring and sampling activities include fish (covering the full range of life stages), water quality parameters and genetic material.

Question. How is the Bureau of Reclamation working with other Federal agencies, like NOAA Fisheries and Fish and Wildlife Service, to research and evaluate the impacts of Delta operations on fish behavior and potential mortality?

Answer. Reclamation continues to work with a consortium of multiple agencies (including NOAA Fisheries and FWS) within the framework of the Interagency Ecological Program (IEP). The IEP provides relevant and timely ecological information for management of the Bay-Delta ecosystem and the water that flows through it. Priorities within the program include:

—Improving the understanding of abundance, distribution, life history diversity, and life stage requirements of Delta smelt, longfin smelt, salmonids, steelhead and green sturgeon to inform management decisions.

—Improving smelt, salmonid and sturgeon real-time monitoring, indirect mortality, and entrainment prediction tools to reduce take and increase operational flexibility of the State and Federal water project pumps.

—Improving chinook and steelhead viability in the Delta with an initial emphasis on south Delta salmon survival through studies and modeling.

—Understanding the factors impairing water beneficial uses to inform management decisions.

Reclamation has supported a number of studies on juvenile salmonid survival in relation to Delta operations. These studies include:

—A 6 year fish tracking and monitoring study of San Joaquin steelhead survival (called for in NOAA Fisheries biological opinion).

—Fish tracking and monitoring studies of juvenile Chinook movement in relation to Delta Cross Channel operations (with FWS and the U. S. Geological Survey (USGS)).

—Physical and non-physical barrier studies at Head of Old River and Georgiana Slough (with the California Department of Water Resources and USGS).

—Chinook salmon survival studies based on coded wire tag recoveries (with FWS).

The majority of projects are coordinated with NOAA Fisheries and FWS with multiple project work teams (Chinook salmon, smelt, sturgeon, steelhead, delta rearing, Sacramento River monitoring, hatchery, and collaborative adaptive management team) and the Delta Operations groups continuously seeking ways to understand fish behavior, mortality and to improve survival.

QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

Question. Commissioner López, farmers in the Odessa Subarea of the Columbia Basin Project have faced significant challenges for several years as groundwater from the aquifer has been declining. This rapid decline has put agriculture production and commercial, municipal, and industrial water uses at risk. According to a study conducted by Washington State University, $840 million and 3,600 jobs are at risk if agriculture producers in the Odessa Subarea no longer have access to groundwater from the aquifer and no alternative water solution is in place.

I appreciate your ongoing work with the State of Washington and the three impacted irrigation districts to prevent further depletion of the Odessa Subarea aquifer and deliver much needed surface water to agricultural lands within the Columbia Basin Project. Renewing the Master Water Service Contract with the East Columbia Basin Irrigation District (ECBID) last year was a significant milestone in this process. This will ensure ECBID can move forward with the development of the first of seven planned pressurized delivery systems to provide surface water to 87,700 acres of the Odessa Subarea in the Columbia Basin Project.

I understand that additional amendments to the Water Service Contract are needed for 70,000 acres within the Odessa Subarea. What is the current status of this amendment and when do you expect it to be completed?

Answer. Work on the amendment to the Master Water Service contract is in progress. Evaluation of the existing annual water service rate and completion of the rate-setting process are underway. Reclamation completed a draft payment capacity study in March 2016 and received comments from the irrigation districts in May 2016. Reclamation is reviewing the districts' comments and finalizing this study, which is needed to complete an ability to pay study. Reclamation has several other actions to complete as part of this process, including environmental compliance, reviewing land eligibility, completing a basis of negotiation, preparing the contract amendment, and negotiating the contract with ECBID. Additionally, Reclamation is required to provide a 60-day public notice prior to contract execution. We expect this process to be complete by the end of calendar year 2016.

Question. Are you aware of any challenges that may delay completion of this work?

Answer. We do not expect any delays. Unanticipated factors, including litigation or a significant change request from ECBID could delay completion of the process. The requirement for a 60-day public notice prior to contract execution was factored in to the completion date noted in the previous question.

SUBCOMMITTEE RECESS

Senator ALEXANDER. Thank you for being here today.

The subcommittee will stand adjourned.

Senator FEINSTEIN. Thank you, Mr. Chairman. Good work.

[Whereupon, at 4:35 p.m., Wednesday, March 2, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2017

WEDNESDAY, MARCH 9, 2016

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

The subcommittee met at 2:37 p.m., in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Graham, Hoeven, Lankford, Feinstein, Udall, Shaheen, and Coons.

DEPARTMENT OF ENERGY

OFFICE OF THE SECRETARY

STATEMENT OF HON. ERNEST J. MONIZ, SECRETARY

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. The Subcommittee on Energy and Water Development will please come to order.

Today's hearing will review the President's fiscal year 2017 budget request for the Department of Energy. This is the subcommittee's third budget hearing this year. We will have our final hearing on the National Nuclear Security Administration's budget next week.

I would add that Senator McConnell has said to the Republican Caucus that he hopes we move rapidly on appropriations bills this year. He would like to start April 15. He said that after he received a letter from the Democratic leadership, urging him to do that.

In past years, this committee has been able to work well together, whether we had a Democrat or Republican chairman, and agree on a bill with our members in the House and be one of the first bills ready for consideration for the floor. I hope we can do that again.

In doing that, I hope that we will have plenty of policy items in the budget, and I hope so-called controversial riders will not be added in the subcommittee or committee, so we can get the bill to the floor. If anybody thinks they have 60 votes to put something controversial on the bill, they can offer it on the floor or they can run for the House of Representatives. Those are the two ways to do that.

[Laughter.]

Senator ALEXANDER. We will see. That will be our goal. I am hopeful we can do that.

Senator Feinstein and I will each have an opening statement. I will then recognize each Senator for up to 5 minutes for an opening statement, alternating between the majority and minority in the order in which they arrived. We will then turn to Secretary Moniz for his testimony on behalf of the Department of Energy. And then I will recognize Senators for 5 minutes of questions each, alternating back and forth.

I want to thank the Secretary for being here. We enjoy working with him. He is responsive to our questions, and he is competent in his work. We thank him for his service to the country.

Of course, it is a delight to work with Senator Feinstein on these important issues. We work well together. We have differences of opinion, but in the end, we come to a result.

Our witness today is Secretary Moniz, who has been Secretary since 2013. The department's energy budget request is about $32.5 billion, an increase of $2.9 billion over what Congress provided last year.

PRIORITIES

Governing is about setting priorities. Given our current fiscal constraints, especially on nondefense spending, we are going to have to make some hard decisions this year. That is why we are holding the hearing, to talk about the most urgent priorities.

I would like to focus on three main areas, one doubling basic energy research; two, the future of nuclear energy; three, keeping large projects on time and on budget.

I see Senator Graham here. He and all of us really are concerned about these large projects in the department, and we will get into that more later.

DOUBLING BASIC ENERGY RESEARCH

Doubling basic energy research, that is one of the most important things we could do. I think Republicans and Democrats agree that government-sponsored research has and continues to be important for our continued prosperity and job creation. Doubling basic energy research is a goal I have long supported. We have increased investment in basic energy research, both through our national labs and through the ARPA–E agency, which was created as part of the America Competes legislation 10 years ago and passed unanimously by the Senate. It authorized Congress to double funding for basic research over 7 years.

Last month, Senator Durbin and I cosponsored an amendment to the energy bill that is being worked on in the Senate that increases the authorized funding levels for the Office of Science by about 7 percent a year, which would double the Office of Science's budget from a little over $5 billion today to more than $10 billion in 10 years. The Senate adopted our amendment.

The President has also proposed to invest more in basic research, including the Mission Innovation proposal, a pledge launched by the United States and 19 other countries at the climate summit in Paris to double Federal clean energy research over the next 5 years.

The problem is that the President's budget request proposes $2.259 billion in new mandatory funding for the Department of Energy. The mandatory funding would be used to support clean energy proposals and replace several proposed cuts to programs that were currently funded with discretionary spending. These new mandatory spending proposals include $1.3 billion for the 21st Century Clean Transportation Plan; $674 million to replace discretionary spending cuts in cleanup programs that is especially concerning to me; $100 million for new Office of Science university grants; and $150 million to support ARPA–E (Advanced Research Projects Agency—Energy).

However, the President's commitment to double Federal clean energy research comes at the expense of other resources and agencies, and he proposes to pay for this new mandatory spending with new tax increases.

This is not a realistic proposal. The budget writers know this. Congress is not going to enact $3.4 trillion in new tax increases over the next 10 years to pay for an additional $682 billion in mandatory spending spread across Federal agencies over the next 10 years.

Senator Murray and I just finished a hearing this morning on our biomedical innovation project, and there is mandatory spending discussions there to replace the increases that we made this past year in funding for the National Institutes of Health.

This kind of budgeting is at best unhelpful, at worst misleading.

First, the President has underfunded the Army Corps of Engineers by $1.4 billion and the cleanup of former Cold War sites by $674 million. That makes it very difficult to draft an appropriations bill, much less fund the proposed new investments in Mission Innovation.

Second, while I have called for doubling our investment in basic research, I have also recommended paying for increases like that by ending subsidies for mature technologies like wind and oil and gas subsidies.

For example, we could start by eliminating the wind production tax credit in 2016 and putting the $4 billion this subsidy costs taxpayers over 10 years toward doubling energy research, and we could phase out subsidies for oil and gas. Legislative proposals similar to the one I supported in February to repeal oil and gas subsidies save $24 billion over 10 years, which could be spent on research and development.

Out of control mandatory spending on entitlements, which is projected to increase nearly 80 percent over the next 10 years, is already crowding out discretionary spending. Here is the most important point. Over the next 10 years, discretionary spending, the money we are talking about to fund cancer research in this morning's hearing, or Office of Science research in today's hearing, discretionary spending, that part of the budget is 32 percent of total Federal spending. If things continue at the pace they are on, it will be 22 percent in 10 years, according to the Congressional Budget Office.

So this share of the budget is going from 32 percent to 22 percent. So the more responsible proposal about mandatory spending would be to reduce mandatory spending by $682 billion, so we

could have more money for cancer research and energy research, rather than to propose more mandatory spending paid for by taxes.

The United States faces a choice between falling further behind competitors or advancing technologies, but we have to be responsible fiscally.

Supercomputing is one priority we agree on. It is critical to our competitiveness. By next year, the world's fastest computer will again be in the United States. I am glad to say it is in Tennessee through the joint collaboration of Oak Ridge, Argonne, and Lawrence Livermore in California. That computer will be called Summit. It will help researchers better understand materials, nuclear power, and energy breakthroughs. The next generation on the exascale is essential to both our country's competitiveness and national security.

FUTURE OF NUCLEAR ENERGY

Now, as for nuclear energy, nuclear energy provides 60 percent of our Nation's carbon-free electricity, 60 percent, and it must be part of any realistic energy plan. It is reliable. Unlike solar and wind, nuclear power works when the sun is not shining and the wind is not blowing. It is safe. We have never had anyone die in a nuclear accident at any of our commercial reactors or in our naval fleet.

The Department of Energy, Mr. Secretary, has an important role in many of the key challenges in advancing nuclear power, for example, safely extending the life of existing nuclear reactors already operating, the quickest and easiest and best way to provide ourselves with carbon-free electricity for the next 20 years; solving the nuclear waste stalemate, a goal that Senator Feinstein and I are united on; developing new nuclear technologies such as accident-tolerant fuels, small reactors, advanced reactors.

Regarding nuclear waste, Federal law makes the Government responsible for disposing of used nuclear fuel. The Government continues to fail in this.

I believe Yucca Mountain can and should be part of the solution, but we have more used fuel than Yucca Mountain's legal capacity. Senator Feinstein and I will again introduce a pilot program for nuclear waste storage in our appropriations bill, as we have for the past 4 years, to complement, not substitute, for Yucca Mountain.

The Nuclear Regulatory Commission chairman testified they expect to see license applications for commercial sites to store used nuclear fuel later this year. I am going to ask about your views on the role that commercial sites could play in the management of used nuclear fuel.

Finally, as we look to the future, the department is funding key R&D (Research and Development) that will design the nuclear reactors of the future, whether we are talking about small reactors or advanced reactor technology.

LARGE CONSTRUCTION PROJECTS

The last item is keeping large projects on time and on budget. The department is responsible for some of the largest and most expensive construction projects in the Federal Government—for that matter, in the country—including the uranium processing facility

in Tennessee and the MOX fuel fabrication facility in South Carolina. The department is a partner in the international thermonuclear experimental reactor known as ITER in France.

Now that you are no longer recused from discussing fusion energy and you know so much about it, we are looking for your recommendations about what to do.

Over the past 5 years, Senator Feinstein and I have worked hard with the department to keep costs under control. We have made some real progress with a uranium facility in Tennessee. I am glad to hear that the department continues to follow the red team's recommendation.

It has a capped cost of $6.5 billion, and a completion date of 2025. And we meet regularly to make sure it is proceeding on time and on budget.

Your budget request also proposes shutting down the MOX fuel facility in South Carolina and replacing it with a new plan to dispose of the plutonium in South Carolina. We have talked about that many times. I am sure Senator Graham will have questions about that, as I will as well.

I hope to hear the details about your alternative to dilute the plutonium material. I want to make sure we have a clear plan for getting the plutonium out of South Carolina, as the department has committed to do.

[The statement follows:]

PREPARED STATEMENT OF SENATOR LAMAR ALEXANDER

The Subcommittee on Energy and Water Development will please come to order.

Today's hearing will review the President's fiscal year 2017 budget request for the Department of Energy.

This is the Subcommittee's third budget hearing this year, and we will have our final hearing on the National Nuclear Security Administration's budget next week.

I want to thank Secretary Moniz for being here today, and also Senator Feinstein, who I will be working with to draft the Energy and Water Appropriations bill which funds basic science research and discovery, as well as cleanup of former Cold War sites, and maintains our Nation's nuclear weapons stockpile.

Our witness today includes Dr. Ernest J. Moniz, Secretary of Energy.

Secretary Moniz has served as Secretary of Energy since May 2013, and I thank the Secretary for his leadership and the efforts he has made to work with Congress. I greatly appreciate your leadership on innovation and our energy future.

We're here today to review the President's fiscal year 2017 budget request for the Department of Energy, a Federal agency with three critical missions: nuclear security, science and energy, and environmental management.

The Department of Energy's budget request for fiscal year 2017 is about $32.5 billion dollars. This is an increase of about $2.9 billion over what Congress provided last year.

Governing is about setting priorities, and given our current fiscal constraints—especially on non- defense spending—we are going to have to make some hard decisions this year to make sure the highest priorities are funded.

And that is why we are holding this hearing: to give Secretary Moniz an opportunity to talk to us about the Department of Energy's most urgent priorities so Senator Feinstein and I can make informed decisions as we begin to put together the Energy and Water Appropriations bill over the next few weeks.

Today, I'd like to focus my questions on three main areas, all with an eye toward setting priorities:

1. Doubling basic energy research;
2. The future of nuclear energy;
3. Keeping large projects on time and on budget.

DOUBLING BASIC ENERGY RESEARCH

Supporting government-sponsored basic research is one of the most important things our country can do to encourage innovation, help our free enterprise system create good jobs, and make America competitive in a global economy.

Doubling basic research is a goal I've long supported.

We have increased investment in basic energy research through both our national laboratory system and the Advanced Research Projects Agency-Energy (ARPA–E), which Congress created as part of America COMPETES in 2007, which was passed unanimously by the Senate and authorized Congress to double funding for basic research over 7 years.

Last month Senator Durbin and I co-sponsored an amendment to the Energy bill that increases the authorized funding levels for the Office of Science by about 7 percent per year which would double the Office of Science's budget from a little over $5 billion today to more than $10 billion in 10 years. The Senate adopted our amendment by voice vote.

The President has also proposed to invest more in basic research, including the Mission Innovation proposal—the pledge launched by the U.S. and 19 other countries at the Climate Summit in Paris to double Federal clean energy research over the next 5 years.

The problem is that the President's budget request proposes $2.259 billion in new mandatory funding for the Department of Energy. The mandatory funding would be used to support clean energy programs and replace several proposed cuts to programs that are currently funded with discretionary spending.

These new mandatory spending proposals include:

—$1.3 billion for 21st Century Clean Transportation Plan Investments;

—$674 million to replace discretionary spending cuts in cleanup programs;

—$100 million for new Office of Science University Grants;

—And $150 million to support ARPA–E.

However, the President's commitment to double Federal clean energy research comes at the expense of other resources and agencies and he proposes to pay for this new mandatory spending with new tax increases.

The budget writers know this isn't a realistic proposal. Congress is not going to enact $3.4 trillion in new tax increases over the next 10 years to pay for an additional $682 billion in mandatory spending across all Federal agencies over the next 10 years.

The President's budget request this year is at best unhelpful, and at worst it's misleading.

First, the President has underfunded the Army Corps of Engineers by $1.4 billion and the cleanup of former Cold War sites by $674 million. This makes it very difficult to draft an appropriations bill, much less fund the proposed new investments in Mission Innovation.

Second, I've called for doubling our investment in basic scientific research, but I've also recommended paying for increases by ending subsidies for mature technologies like wind and oil and gas subsidies.

For example, we could start by eliminating the wind production tax credit in 2016, and putting the $4 billion this subsidy costs taxpayers over 10 years toward doubling energy research.

Or, we could phase out subsidies for oil and gas. Legislative proposals similar to the one I supported in February to repeal oil and gas subsidies could save $24 billion over 10 years, which could be spent on research and development.

Out-of-control mandatory spending on entitlements, which is projected to increase nearly 80 percent over the next 10 years, is already crowding out discretionary spending.

Over the next 10 years, discretionary spending will decrease from 32 percent of total Federal spending in 2015 to about 22 percent in 2026.

The United States faces a choice between falling further behind competitors like China, or advancing technologies that can make us safer and more competitive.

But we have to be fiscally responsible and carefully invest our limited resources in programs that can achieve results.

For example, supercomputing is one priority we agree on—and it is critical to our economic competitiveness and a secure energy future.

By next year, the world's fastest supercomputer will again be in the United States, and in Tennessee through the joint Collaboration of Oak Ridge, Argonne and Lawrence Livermore (CORAL).

That computer will be called Summit, and it will help researchers better understand materials, nuclear power, and energy breakthroughs.

Funding the next generation, known as exascale, is essential to our both our country's competitiveness and national security.

Exascale computers will be capable of a thousand-fold increase in sustained performance over today's petascale computers—which have been operating since 2008.

THE FUTURE OF NUCLEAR ENERGY

Nuclear power provides 60 percent of our Nation's carbon-free electricity, and it must be a part of any realistic energy plan.

It is reliable—unlike solar and wind, nuclear power works when the sun isn't shining or the wind isn't blowing.

It is safe—we've never had anyone die in a nuclear accident at any of our commercial reactors or in our naval fleet.

The Department of Energy has an important role in many of the key challenges in advancing nuclear power, including:

—Safely extending the life of the nuclear reactors already operating today;

—Solving the nuclear waste stalemate; and

—Developing new nuclear technologies such as accident tolerant fuels, small modular reactors, and advanced reactors.

Safely extending the operating licenses of commercial reactors from 60 to 80 years, where possible, is an important step to maintaining our largest source of carbon-free electricity.

I'd like to hear today what the Department of Energy is doing to achieve this goal and whether there are any additional steps we should be taking.

Regarding nuclear waste, Federal law makes the government responsible for disposing of used nuclear fuel, and the government continues to fail in this responsibility.

I believe that Yucca Mountain can and should be part of the solution, but we have more used fuel than Yucca Mountain's legal capacity.

Senator Feinstein and I will again include a pilot program for nuclear waste storage in the Energy and Water Appropriations bill, as we have for the past 4 years to complement Yucca Mountain.

The NRC Chairman recently testified that they expect to see license applications for commercial sites to store used fuel later this year. I'd like to hear your views on the role commercial sites could play in the management of used nuclear fuel.

Finally, as we look to the future, the Department is funding key research and development that will help design the nuclear reactors of the future.

Small modular reactors offer an additional source of clean, cheap, reliable energy, and have the potential to make nuclear power available to places that could not otherwise build large-scale reactors. The Department's work to support licensing a small modular reactor continues, and I would like to your views on the progress of this important work.

The Department is also doing research and development to address technical, cost, safety and security issues with advanced reactor technologies. I look forward to hearing the progress you are making in this area, and am particularly interested in your estimate for when the first application for certification would be filed with the Nuclear Regulatory Commission.

KEEPING LARGE PROJECTS ON TIME AND ON BUDGET

The Department of Energy is responsible for some of the largest construction projects in the Federal Government, including the Uranium Processing Facility in Tennessee and the MOX Fuel Fabrication Facility in South Carolina; and the Department is a partner in the International Thermonuclear Experimental Reactor known as "ITER" in France.

Now that you are no longer recused from discussing fusion energy and the ITER project specifically, I want to discuss the future of U.S. participation in the project, and when we can expect to receive your recommendations and details on the new cost of the project.

Over the past 5 years, Senator Feinstein and I have worked hard with the Department to keep costs under control and to make sure hard-earned taxpayer dollars are spent wisely. We need to make sure these projects are on time and on budget.

Senator Feinstein and I have focused much of our oversight on the Uranium Processing Facility in Tennessee, and I am glad to hear the Department continues to follow the Red Team's recommendations.

I look forward to a detailed update in the near future, including whether the project is still on time and on budget, and when the design will be 90 percent complete. We set a target of completion in 2025 at a cost of $6.5 billion and we need to know if that is achievable.

Your budget request also proposes shutting down the MOX fuel facility in South Carolina and replacing it with a new plan to dispose of the plutonium in South Carolina. We have talked about this project many times.

Today, I hope to hear the details about your alternative to dilute the plutonium material and permanently dispose of it. Specifically, I want to make sure you have a clear plan for getting plutonium out of South Carolina as the Department has committed to do.

Senator ALEXANDER. Senator Feinstein.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thanks very much, Mr. Chairman. I think you know that I treasure the relationship that we have, and particularly our ability to work closely together in solving some problems.

I am not going to repeat what you said. I find myself generally in agreement with it. But I am really very concerned, because it seems to me we are between a rock and a hard place with this. We do not yet have an allocation, and yet there are a number of conflicts within this budget.

Let me just thank you for the leadership and cooperation on finding a nuclear waste facility. I would be hopeful that the Secretary will be able to tell us in his remarks that the law is such that the private Texas facility can go ahead. I think that is extraordinarily important.

I hope, Mr. Secretary, that you will choose to speak about it.

I also want to congratulate the Secretary, because I have not had this chance, on his successful negotiations at the Paris agreement on climate change. I think it is becoming very clear that unless we reduce our greenhouse gas emissions, we are going to see catastrophic sea level rise, devastating droughts, more wildfires, more habitat loss, greater ranges of exposures for disease, and massive international refugee crises.

I say that as a Californian who is now in the midst of an unprecedented drought with just terrible results, land subsidence, 888 million trees losing their capacity, 10 million of them dead, 69 communities without water. It goes on and on and on.

So we do not want the climate to go the way it is set to go. It is my understanding that we must contain temperature rise to 2 degrees or less by 2100 or we court disaster.

Although this is a significant and difficult challenge, I think it can be done. For the first time, 195 countries have mutually pledged to constrain their greenhouse gas emissions in order to slow the changes in our climate, working not only to avoid the 2 degree increase, but toward a goal of a 1.5 degree increase.

But even the most optimistic assessment of the first round of international commitments is that they would still allow global temperatures to rise by even 2.7 degrees. That clearly is insufficient in terms of the danger that we prompt by so doing.

Secretary Moniz, you have championed the idea of using technology to make this goal easier to achieve, and you have worked to secure pledges from 19 other countries to double research and development funding for technologies that can lower temperature rise. I understand this is known as Mission Innovation and that it is complemented by a private-sector initiative led by Bill Gates to bring these new technologies to the market.

Our commitment is to double U.S. clean energy research and development over 5 years. Much of that needs to be funded by this subcommittee.

In view of what the chairman has just said, that is going to be a most difficult task to carry out. As I said, we do not have an allocation, but the likelihood of our having sufficient money even to fund what we are responsible for right now that we cannot do based on this President's budget is alarming to me.

I believe that if somehow we can get a sufficient increase in our allocation, that we should, in fact, make Mission Innovation a priority.

But one big obstacle to achieving this is the fact that the administration's budget request zeros out funding for uranium cleanup, which was $674 million in fiscal year 2016.

Now, that is a real Hobson's choice. There is not one of us, I think, that understands that uranium cleanup should be canceled out, and yet where is the money to come from? I gather the budget assumes that the cleanup program will become a mandatory funded program, which means it goes out of the budget because it is mandatory. Whatever its cost, it is paid for. But there is no indication this is going to happen.

So we will have to appropriate money for those activities within the bounds of our overall resources unless somebody is able to tell us where to get $674 million.

Also, as we deal with the impacts of climate change and promote infrastructure resiliency, I do not believe that Congress will accept the administration's proposal to cut funding for the Army Corps of Engineers by $1.3 billion or the Bureau of Reclamation by $163 million.

These are the Hobson's choices within our budget. The Corps is really our only infrastructure program. It is our government's only navigation infrastructure account. Reclamation brings water to our cities and farms. And both play an important role in responding to climate change.

So, Mr. Chairman and Mr. Secretary, to be brief, I have outlined nearly $1 billion of responsibilities for money that we will likely not have.

So, Mr. Secretary, I know I speak for this whole committee. We would very much like to work with you and our other colleagues to identify the ways we can best use the funding that is available to develop the new technologies, specifically the R&D that will make the difference in our fight against climate change. But we also have to fund uranium cleanup, the Bureau of Reclamation, and the Army Corps of Engineers, in particular.

I might just say that of the congressional interest, the Army Corps always crops up, Mr. Chairman, in requests for more members. I have come over the years to really believe that it is a very important program. It sounds kind of prosaic because it has always been there, but in terms of our rivers, our waterways, it is kind of the be-all and end-all.

So I thank you, Mr. Chairman, and look forward to working with you.

Senator ALEXANDER. Thank you, Senator Feinstein. We will now have opening statements from other Senators who are here. Senator Lankford. Senator Murray.

Mr. Secretary, we look forward to your testimony.

SUMMARY STATEMENT OF HON. ERNEST J. MONIZ

Secretary MONIZ. Thank you, Chairman Alexander and Ranking Member Feinstein, and members of the subcommittee for the chance to appear here to discuss our budget proposal for fiscal year 2017.

As you have said, it totals $32.5 billion in discretionary and mandatory spending. First, I do want to emphasize that the request for annual appropriations is $30.2 billion, an increase of 2 percent over the fiscal year 2016 enacted appropriation. Both the national security appropriations request and that for the domestic appropriations would each increase by 2 percent.

This is supplemented, as you have mentioned, by $2.3 billion in new mandatory spending authority, including $750 million for R&D and $674 million for uranium enrichment D&D (Decontamination and Decommissioning), the latter from the USEC (United States Enrichment Corporation) Fund.

I do want to emphasize that the $1.6 billion USEC Fund is an existing, not new, mandatory spending account. Our proposal is in keeping with the spirit of the current authorization that revenues from the beneficiaries of past uranium enrichment services rather than taxpayers at large be used to pay for the cost of D&D of the now shuttered facilities.

Indeed, in 2000, Congress recognized the applicability of the USEC Fund to support Portsmouth and Paducah D&D. The USEC Fund is one of three Federal funds totaling nearly $5 billion that can be used in this manner.

Finally, in this introduction I want to acknowledge that underpinning all of our priorities is stewardship of the department as a science and technology powerhouse with an unparalleled network of 17 national laboratories. We are working hard to strengthen the strategic relationship between the department and our national laboratory network.

I also want to highlight the crosscutting R&D initiatives in the budget. Among these initiatives are our largest increases. Our proposed increases are for modernization, the energy and water nexus, and the exascale high-performance computing initiative to support everything from nuclear weapons to energy technologies to cancer solutions.

The supporting budget details for each of these areas are provided in a 40-page statement for the record, and I request that it be inserted into the record and use the rest of my time to describe our Mission Innovation initiative and why it merits your support.

The fiscal year 2017 budget includes an increase of 21 percent in discretionary spending for clean energy R&D activities that support the U.S. Mission Innovation pledge. The President's budget proposes this 21 percent increase in discretionary funds within the overall discretionary budget cap. The mandatory request is incremental but the discretionary is within the cap.

Mission Innovation is an unprecedented global initiative by 20 countries that have pledged to seek a doubling of public clean energy R&D over 5 years. The Mission Innovation countries represent over 80 percent of global government investment in clean energy R&D. So this entails a highly leveraged opportunity to drive energy innovation.

This is a key to cost reduction in clean energy. That in turn is key to increasing ambition and driving us to a clean energy future.

Mission Innovation is long overdue. In 2010, the American Energy Innovation Council, comprised of CEOs from multiple sectors, recommended that the government triple its investment in clean energy R&D, and the council made three key points.

First, innovation is the essence of America's strength. Second, public investment is critical to generating the discoveries and inventions that form the basis of disruptive energy technologies. And third, the costs of RD&D are tiny compared to the benefits.

The pledge to seek to double the level of government investment over 5 years is ambitious but needed. Bill Gates, a leader of the AEIC, has recently met with a number of Members of Congress and has reiterated the need for greatly increased government-sponsored energy R&D.

The objective of Mission Innovation is to greatly expand the suite of the investable opportunities in clean energy technologies. The United States and global clean energy markets have been growing rapidly and should pick up the pace even more as the world's nations implement the Paris agreement.

Picking up the pace of our own clean energy innovation will result in commensurate benefits for our economy, environment, and security.

The scope of Mission Innovation spans the entire innovation cycle from the earliest stage of invention through initial demonstrations with a weighting toward the early stages and all clean supply and demand technologies and infrastructure enablers.

Mission Innovation is complemented by the Breakthrough Energy Coalition that was launched simultaneously with Mission Innovation. It is spearheaded by Bill Gates, launched with 28 investors from 10 countries.

The coalition committed to providing investment in new technologies originating from the expanded innovation pipelines in the Mission Innovation countries from early-stage R&D through ultimate market deployment.

These investors are committed to a higher risk tolerance and patience for return than is typical combined with a willingness to take the most promising innovations all the way past the finish line to deployment. That is another important leveraging of Mission Innovation.

In particular, I want to single out the fiscal year 2017 budget proposal for $110 million to establish regional clean energy innovation partnerships as not-for-profit consortia competitively selected for a fixed period to manage regional clean energy R&D programs focused on the energy needs, policies, resources, and markets of the individual regions. The program design and portfolio compositions for each partnership will be based on regional priorities.

As research portfolio managers, not performers, the partnerships will connect resources and capabilities across universities, industry, innovators, investors, and other regional leaders to accelerate the innovation process within each region. This approach tracks recommendations from the National Research Council's Rising to the Challenge, which noted that until very recently, U.S. Federal agencies have done little to support State and regional innovation cluster initiatives and recommended that, and I quote, "Regional innovation cluster initiatives by State and local organizations should be assessed and, where appropriate, provided with greater funding and expanded geographically."

The Mission Innovation budget also supports increased investments in successful ongoing innovation programs at universities, national labs, and companies, such as ARPA–E, Energy Frontier Research centers, advanced manufacturing centers, bioenergy centers, advanced transportation technology, advanced nuclear reactor technology, and next-generation carbon capture technologies, to name a few.

That concludes my summary. I thank the subcommittee for its interest in support of our programs. I look forward to our discussion and to working together over the next months.

[The statement follows:]

PREPARED STATEMENT OF HON. ERNEST J. MONIZ

Chairmen Cochran and Alexander, Vice Chairwoman Mikulski and Vice Chairman Feinstein, and Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss the Department of Energy's (DOE) Budget Request for fiscal year 2017. I appreciate the opportunity to discuss how the Budget Request advances the Department of Energy's missions.

ADVANCING NUCLEAR SECURITY, SCIENCE & ENERGY, AND ENVIRONMENTAL CLEANUP

The Department of Energy requests $32.5 billion for fiscal year 2017, an increase of $2.9 billion from the fiscal year 2016 enacted level of $29.6 billion. The fiscal year 2017 Budget Request consists of $30.2 billion in discretionary funding—$640 million above the fiscal year 2016 enacted appropriation—and $2.3 billion in new mandatory spending proposals requiring new legislation.

The DOE Budget Request supports a broad portfolio of programs, including support for the National Laboratory system of 17 laboratories to carry out critical responsibilities for America's security and economy in three areas:

—Building the Future through Science and Clean Energy;
—Ensuring Nuclear Security; and
—Organizing, Managing and Modernizing the Department to Better Achieve its Enduring Missions.

Underpinning all of these priorities is stewardship of the Department as a science and technology powerhouse, with an unparalleled network of national laboratories, harnessing innovation to successfully address national security, create jobs and increase economic prosperity, boost manufacturing competitiveness, mitigate and adapt to climate change, and enhance energy security.

Energy has been an important driver for recent U.S. economic growth, due to expanded domestic energy production and reduced petroleum imports; increased energy efficiency and productivity; and significant cost reduction and expanded market application of a variety of clean energy generation and energy-efficient industrial, commercial and consumer energy products. DOE has advanced this technology-based energy revolution by supporting the scientific foundations of energy sciences and technology, clean energy and manufacturing technological innovation, early commercial demonstration and deployments, and new technologies and standards to enhance end use energy efficiency. For example, because of DOE technology successes, favorable policies, and other factors, the cost of utility-scale photovoltaic solar power fell 59 percent and power purchase agreements for wind power fell 66 percent from 2008 to 2014. Yet work remains to enhance energy security and U.S. clean energy competitiveness while enabling global climate goals.

The DOE fiscal year 2017 Budget Request includes a programmatic level of $12.9 billion for energy, science, and related programs, an increase of $2.8 billion from the fiscal year 2016 enacted level. The fiscal year 2017 Budget includes $11.3 billion in discretionary funding—$1.2 billion above fiscal year 2016— and $1.6 billion in mandatory spending proposals to support increased investment in leading-edge science and technology; new research facilities to advance the frontiers of science; advanced manufacturing institutes; implementation of the Administration's strategy for nuclear waste management; and crosscutting initiatives to further technological innovation using an enterprise-wide approach to research efforts. The Budget Request takes steps to implement recommendations from the first installment of the Quadrennial Energy Review (QER), released in 2015, to strengthen U.S. energy infrastructures and enhance our collective energy security.

The Request supports ongoing implementation of the President's Climate Action Plan and builds on the systems-based analysis of the Quadrennial Technology Review (QTR) released in 2015. The fiscal year 2017 Budget Request also takes a significant first step toward fulfilling the United States' pledge to seek to double Federal clean energy research and development investment over the next 5 years as part of Mission Innovation, an initiative launched by the U.S. and 19 other countries to accelerate widespread clean energy technology innovation and cost reduction. The Request provides a total of $5.86 billion in discretionary funding for clean energy activities that span the full range of research and development from use-inspired basic research to demonstration, representing an increase in discretionary funding of over 21 percent above the fiscal year 2016 baseline of $4.82 billion. DOE's funding is 76 percent of the $7.7 billion government-wide Mission Innovation investment in fiscal year 2017.

The fiscal year 2017 Budget Request also includes mandatory funding for clean energy R&D that complements activities supported by discretionary funding. The Request includes $150 million in mandatory funding for the Advanced Research Projects Agency—Energy (ARPA–E) as part of the ARPA–E Trust proposal that seeks $1.85 billion in mandatory funding over 5 years to reliably increase the program's transformational clean energy technology R&D. In addition, as part of the $1.3 billion mandatory proposal for the DOE portion of the Administration's 21st Century Clean Transportation Plan, the Request includes $500 million in fiscal year 2017 to scale-up clean transportation R&D through initiatives to accelerate cutting the cost of battery technology; advance the next generation of low carbon biofuels, in particular for intermodal freight and fleets; and establish a mobility systems integration facility to investigate systems level energy implications of vehicle connectivity and automation.

The fiscal year 2017 Budget Request provides a programmatic level of $12.9 billion for the National Nuclear Security Administration (NNSA), $357 million above the fiscal year 2016 enacted level, to support DOE's nuclear security responsibilities. The Budget Request includes funding to maintain a safe, secure, and effective nuclear deterrent without underground nuclear explosive testing, including life extension programs for major weapons systems and modernization of the Nation's research and production infrastructure.

The Request also ensures that the United States is ready to respond to nuclear and radiological incidents at home and abroad and supports programs that reduce the threats of nuclear proliferation globally, including supporting implementation and monitoring of the Joint Comprehensive Plan of Action with Iran to verifiably prevent Iran from obtaining nuclear weapons. Finally, DOE's Request for nuclear security supports activities that provide safe and effective propulsion for the U.S. nuclear Navy.

The fiscal year 2017 Budget Request includes $6.8 billion for Departmental management and performance programs, including environmental cleanup programs to meet the nation's Manhattan Project and Cold War legacy responsibilities. The Request includes $6.1 billion, which includes $5.4 billion in discretionary funding and proposes $674 million in mandatory spending from the United States Enrichment Corporation Fund, to uphold the U.S. Government's commitment to States and communities to remediate the environmental legacy of over six decades of nuclear weapons and nuclear research, development, and production. The Request supports major management reforms, including new project oversight, assessment, and cost estimation initiatives as part of ongoing efforts to strengthen effective project and program management across the enterprise. The Request also supports continued implementation of a new and improved Human Resource Management service delivery business model and efforts to improve information technology management and further strengthen cybersecurity.

SCIENCE AND ENERGY

The fiscal year 2017 Budget Request provides a programmatic level of $12.9 billion for science, energy, and related programs, which is $2.8 billion above the fiscal year 2016 enacted level and includes $11.3 billion in discretionary funding and $1.6 billion in mandatory spending. The Department's science and energy programs invest in all stages of innovation across a diverse portfolio of clean energy technologies to enhance economic competitiveness in a low-carbon world and secure America's long-term energy security. The Request takes the first step in fulfilling the U.S. Government's pledge to Mission Innovation, an unprecedented global initiative across 20 nations to double public clean energy research and development (R&D), in conjunction with commitments for private investments led by a coalition of 28 private investors from ten countries. The Request also continues to implement the President's Climate Action Plan through the development and deployment of clean energy technologies that reduce carbon pollution. Following COP–21, these investments will be a critical next step in enabling the transition to a low carbon energy future through innovation and cost reduction.

The fiscal year 2017 Budget Request sustains DOE's role as the largest Federal sponsor of basic research in the physical sciences and constructs and operates cutting-edge scientific user facilities at the National Laboratories to maintain the nation's preeminence in science and innovation. The Request supports transformational R&D in critical technology areas, including advanced manufacturing, renewable energy, sustainable transportation, energy efficiency, electricity grid modernization, advanced nuclear reactors, and fossil energy with carbon capture and storage. The Request builds on the analytical foundation provided by the Department's 2015 Quadrennial Technology Review (QTR), as well as the recommendations of the 2015 Quadrennial Energy Review (QER), by funding measures to strengthen U.S. energy infrastructures and enhance our collective energy security posture.

MISSION INNOVATION: ENABLING A CLEAN ENERGY FUTURE

The President's fiscal year 2017 Budget Request takes a significant first step toward fulfilling the U.S. pledge to seek to double Federal clean energy research and development investment over the next 5 years as part of Mission Innovation, an initiative launched by the U.S. and 19 other countries to accelerate widespread clean energy technology innovation and cost reduction. It is a widely-shared view that innovation is essential for economic growth by providing affordable and reliable energy for everyone, is critical for energy security, enhances U.S. competitiveness, and is the key to a transition to a clean energy future. Each of the 20 participating countries, which together represent over 80 percent of global governmental clean energy research and development, will seek to double its governmental investment in clean energy research and development over 5 years. While each country will determine its own doubling plan and portfolio, the collection of countries will provide new opportunities for synergies and collaboration.

The need for a substantial investment in clean energy research and development is clear. Many studies have examined the contribution of technological innovation to U.S. economic growth. In 2010, the American Energy Innovation Council, comprised of Chief Executive Officers from multiple industries, called for the tripling of energy research and development, citing the need for a dramatic expansion of the energy innovation pipeline to meet critical national priorities. Another report that same year from the President's Council of Advisors on Science and Technology also recommended accelerating the pace of technology innovation to meet economic competitiveness, environmental and energy security needs. The need for greater regional innovation efforts was highlighted in a 2012 National Research Council report calling for the establishment of regional innovation cluster initiatives that build upon existing knowledge clusters and comparative strengths of a geographic region.

The President's fiscal year 2017 Budget takes a significant first step toward fulfilling the U.S. pledge to seek to double Federal clean energy research and development investment over the next 5 years by providing $7.7 billion across 12 Federal agencies, with DOE responsible for approximately 76 percent of that government-wide total. The DOE fiscal year 2017 Request provides a total of $5.86 billion in discretionary funding for clean energy research and development. This funding represents an increase of over 21 percent above the fiscal year 2016 baseline of $4.82 billion of appropriated funds.

The Budget supports clean energy activities that span the innovation spectrum from use-inspired basic research to demonstration, and encompasses all clean energy technologies, including renewable energy, energy efficiency, sustainable transportation, nuclear energy, fossil energy, and the electricity grid of the future. The

DOE program components supporting Mission Innovation include elements of use-inspired basic research sponsored by the Office of Science, ARPA–E and portions of the applied energy programs that support clean energy research, development, and demonstration activities. Overall, programs supporting Mission Innovation comprise slightly more than half of the total President's fiscal year 2017 Budget Request for science and energy, including ARPA–E.

The increased investments proposed in the fiscal year 2017 Budget support a broad-based strategy for accelerating the innovation process. The strategy emphasizes investments strategically targeted to support innovative platforms for early stage research and technology development, as well as development and demonstration activities that target cost-reduction and advance transformational concepts that can achieve meaningful scale. For example, the President's fiscal year 2017 Budget supports an expansion of promising existing programs, such as Energy Frontier Research Centers, ARPA–E, Clean Energy Manufacturing Institutes, the BioEnergy Research Centers, SuperTruck II, and advanced carbon capture technology pilot projects. The fiscal year 2017 Budget also supports new initiatives, such as $110 million to establish regional clean energy innovation partnerships, $45 million to expand R&D collaborations between innovators and small businesses and the DOE National Laboratories, and an advanced materials crosscutting initiative.

The President's fiscal year 2017 Budget also includes mandatory funding for clean energy R&D that complements activities supported by discretionary funding. The fiscal year 2017 Budget Request includes $150 million in mandatory funding for ARPA–E as part of the ARPA–E Trust proposal for $1.85 billion in new mandatory spending authority over 5 years. The mandatory spending authority will complement annual appropriations by enabling ARPA–E to support projects of a different character than can otherwise be funded under the current program. For example, the mandatory funding will support projects that are larger in scale and address more complex energy challenges that have large transformative potential. As part of the Administration's 21st Century Clean Transportation Plan, the President's fiscal year 2017 Budget Request also includes $500 million in mandatory funding at DOE in fiscal year 2017 to scale-up clean transportation R&D through initiatives to accelerate cutting the cost of battery technology; advance the next generation of low-carbon biofuels, in particular for intermodal freight and fleets; and establish a smart mobility research center to investigate systems level energy implications of vehicle connectivity and automation.

Mission Innovation investments will be leveraged by private capital that drives innovation and clean energy deployment. The initiative is complemented by a separate private sector-led effort, the Breakthrough Energy Coalition (Coalition), as increased government investment, while necessary, is insufficient by itself. This parallel initiative includes over 28 investors from 10 countries and will supplement the large and growing private sector investment in commercialization of clean energy technologies by targeting new investments at an earlier stage of the innovation cycle and managing these investments through the completion of the innovation process, including the formation of new companies and the commercial introduction of new products and processes. The Coalition will be investing in technologies and projects originating in the Mission Innovation participating countries.

Together, these initiatives will drive innovation essential for economic growth enabled by affordable and reliable energy, for energy security, for U.S. competitiveness, and for a transition to a low carbon energy future.

INTEGRATING SCIENCE AND ENERGY PROGRAMS ACROSS THE DOE ENTERPRISE

The fiscal year 2017 Budget Request further strengthens DOE and its national missions by fully integrating across its science and energy programs, and across the DOE enterprise with the national laboratories as strategic partners.

DOE has continued to strengthen and institutionalize its strategic relationship with the National Laboratories through organizations and forums such as the Laboratory Policy Council, the Laboratory Operations Board, and the annual National Laboratories Big Ideas summits, which convene DOE and the Laboratories on a regular basis. DOE is sustaining this strategic partnership through these ongoing collaborations and through new efforts, such as a comprehensive report on the National Laboratories. The Request also outlines how DOE will implement recommendations of the Secretary of Energy Advisory Board (SEAB) taskforce on the national laboratories and the Commission to Review the Effectiveness of the National Energy Laboratories (CRENEL). Last week, the Department submitted its detailed response to the final CRENEL report that addresses the Commission's findings and recommendations.

The fiscal year 2017 Budget also supports DOE's crosscutting initiatives that leverage the science, technology, and engineering capabilities across programs and National Laboratory partners. DOE first proposed the crosscutting initiatives in fiscal year 2015 to enhance enterprise-wide planning and improve collaboration across organization boundaries for key science and technology areas with impact across DOE's missions. Each crosscutting initiative reflects a comprehensive and integrated work plan to optimize programmatic objectives and efficiently allocate resources. The crosscutting initiatives help bolster DOE's efforts to institutionalize enhanced program management and coordination across program offices, while accelerating progress on key national priorities.

DOE has 2 years of experience with integrated planning and program management across program offices, enabling accelerated progress on key national priorities. The fiscal year 2015 and fiscal year 2016 appropriations have provided DOE with funding for the crosscutting initiatives, including $1.1 billion in fiscal year 2016 coordinated across all three Under Secretaries. Moving forward, the fiscal year 2017 Budget Request continues six existing crosscutting initiatives, and proposes a new initiative, Advanced Materials for Energy Innovation. Together, the initiatives closely coordinate the $1.5 billion request, a $330 million increase, in crosscutting R&D across the enterprise in seven technology areas:

—Electricity grid technology modernization accelerates the development of the technologies and tools to enable modernization of the grid to support U.S. economic growth, environmental quality and security objectives.

—Subsurface science, technology, and engineering coordinates efforts to develop next-generation technologies for energy generation, storage, and disposal applications through mastery of the subsurface, with a science-based focus on advanced imaging of geophysical and geochemical signals.

—Supercritical carbon dioxide technology enables large-scale commercialization of the supercritical carbon dioxide (sCO_2) power cycle, which has the potential for higher thermal efficiencies with lower capital cost compared to steam-based power systems and can provide significant benefits for electric power generation, including reducing the costs of carbon capture and storage.

—Energy-water nexus accelerates the Nation's transition to more resilient and sustainable coupled energy-water systems, including a new effort on desalination technology and regional data, modeling and analysis test beds.

—Exascale computing, a joint Science-NNSA collaboration, significantly accelerates the development and deployment of capable exascale computing systems, applications and software infrastructure to meet national security needs and to provide next-generation tools for scientific discovery;

—Cybersecurity protects the Department of Energy enterprise from a range of cyber threats and improves cybersecurity in the electric power and oil and natural gas subsectors; and

—Advanced materials for energy innovations, which have the potential to revolutionize entire industries by employing advanced synthesis, modeling, and characterization to accelerate and reduce the cost of materials qualification in a wide variety of clean energy applications.

SCIENCE: PROVIDING THE BACKBONE FOR DISCOVERY AND INNOVATION

DOE's Office of Science is the largest Federal sponsor of basic research in the physical sciences, supporting more than 24,000 investigators at over 300 U.S. academic institutions and the DOE laboratories. The Office of Science provides the backbone for discovery and innovation, especially in the physical sciences, for America's research community.

The fiscal year 2017 Budget Request provides $5.67 billion for Science, $325 million above the fiscal year 2016 enacted level, to lead basic research in the physical sciences and develop and operate cutting-edge scientific user facilities while strengthening the connection between advances in fundamental science and technology innovation. The fiscal year 2017 Budget Request includes a proposal for $100 million in mandatory funding for university grants that will be made available through a competitive, merit-based review of proposals solicited from and provided by the university community in the Office of Science mission areas.

The Budget Request provides major increases for advanced scientific computing research, basic energy sciences, and biological and environmental research, and funding to operate the Office of Science's scientific user facilities at optimal levels in support of more than 31,000 researchers from universities, national laboratories, industry, and international partners.

Sustaining Leading-Edge Discovery Science

The fiscal year 2017 Budget Request sustains leading-edge discovery science through support for the High Energy Physics and Nuclear Physics programs, a 14 percent increase in investments in Scientific Laboratories Infrastructure, and the new $100 million mandatory proposal for university grants.

In these discovery science programs, Office of Science has contributed to many major recent accomplishments, including collaborating with two international experiments that led to the Nobel Prize in physics for discovering oscillations in neutrinos (fundamental building blocks of our universe that remain poorly understood); contributing to the discovery of three of the four new superheavy elements in the periodic table; opening the most advanced storage-ring-based light source facility, the National Synchrotron Light Source II (NSLS–II); and continuing effective execution of major ongoing science construction projects—the Linac Coherent Light Source II (LCLS–II) and the Facility for Rare Isotope Beams (FRIB)—on schedule and within budget.

For High Energy Physics, the request provides $818 million, $23 million above the fiscal year 2016 enacted level, to understand how the universe works at its most fundamental level by discovering the most elementary constituents of matter and energy, probing the interactions among them, and exploring the basic nature of space and time. The Request implements activities and projects based on the High Energy Physics Advisory Panel (HEPAP) May 2014 strategic plan, including $45 million, an increase of $19 million, to support design for a reconfigured international Long Baseline Neutrino Facility hosted at Fermilab and initial construction for the Deep Underground Neutrino Experiment in South Dakota.

For Nuclear Physics research, the Budget includes $636 million, $19 million above the fiscal year 2016 enacted level, to discover, explore, and understand nuclear matter in a variety of different forms, including continued construction of the Facility for Rare Isotope Beams (FRIB).

Expanding Use-Inspired Research

The Office of Science funds basic science programs that support use-inspired research towards energy and other applications. The Budget Request provides funding to increase operation of the National Laboratory user facilities to optimal levels to accommodate increases in Mission Innovation work. The Request also expands investments in foundations for key technology crosscutting areas, including advanced materials, the subsurface, and the energy-water nexus.

The fiscal year 2017 Budget Request includes $1.94 billion for Basic Energy Sciences, $88 million above the fiscal year 2016 enacted level, to provide the foundations for new energy technologies, to mitigate the environmental impacts of energy use, and to support DOE missions in energy, environment, and national security by understanding, predicting, and ultimately controlling matter and energy. The Budget Request provides $143 million, an increase of $33 million, to initiate five new Energy Frontier Research Centers (EFRCs) and continue to support the existing EFRCs.

The Request provides $662 million for Biological and Environmental Research, $53 million above the fiscal year 2016 enacted level, to support fundamental research and scientific user facilities to achieve a predictive understanding of complex biological, climatic, and environmental systems for a secure and sustainable energy future, including an expanded focus on regional energy-water systems. The Request provides $90 million, a $15 million increase, to expand technology transfer activities during the last year of a 10-year program at the three existing Bioenergy Research Centers (BRC). The Request also includes $10 million for a new initiative in microbiome research that builds on the Department's experience in fundamental genomic science of plants and microbes to understand the fundamental principles governing microbiome interactions in diverse environments.

For Fusion Energy Sciences, the fiscal year 2017 Budget Request includes $398 million, $40 million below fiscal year 2016. The Request will continue to support research to understand the behavior of matter at high temperatures and densities and to develop fusion as a future energy source. The Budget Request also includes $125 million for the U.S. contribution to the ITER project, a major fusion research facility being constructed by an international partnership of seven governments. The Department submitted in mid-February an interim report to Congress on the status of ITER, and we are scheduled to deliver a report in early May with recommendations related to the project.

Investing in High Performance Computing to Support Frontier Science

The Budget Request provides $663 million for Advanced Scientific Computing Research (ASCR), $42 million above the fiscal year 2016 enacted level, to support re-

search in advanced computation, applied mathematics, computer science and networking, as well as development and operation of high-performance computing facilities.

Under this program, DOE has implemented the President's Executive Order on National Strategic Computing Initiative through a multi-year joint program between the Office of Science and NNSA to achieve capable exascale computing. As part of the President's national initiative, DOE announced a $200 million supercomputer award for Argonne National Laboratory, part of a joint Collaboration of Oak Ridge, Argonne, and Lawrence Livermore (CORAL) initiative to develop supercomputers that will be five to seven times more powerful than today's fastest systems in the United States.

The fiscal year 2017 Budget includes $190 million across three Office of Science programs, joined by $95 million in NNSA, to accelerate development of capable exascale computing systems with a thousand-fold improvement in performance over current high-performance computers in support of the President's National Strategic Computing Initiative. Within the Request, the Office of Science will transition exascale funding to a formal Exascale Computing Project, which will follow DOE project management guidelines under DOE Order 413.3b. The Budget also provides $46 million to re-compete the SciDAC partnerships, with new activities to include accelerating the development of clean energy technologies.

The Request funds research on high-performance computing applications unique to the biomedical research community, including $9 million for the President's BRAIN Initiative, in close coordination with the National Institutes of Health. This funding will bring to bear DOE national laboratory capabilities in big data analytics, modeling and simulation and machine learning to support biomedical research challenges in cancer and BRAIN. In other DOE science programs, the Request also enables development of accelerator applications, including advanced proton and ion beams for the treatment of cancer, in coordination with NIH.

ENERGY RESEARCH, DEVELOPMENT, DEMONSTRATION, AND DEPLOYMENT

The fiscal year 2017 Budget Request provides a programmatic level of $6.6 billion for energy research, development, demonstration, and deployment activities, of which $5.2 billion is discretionary funding—an increase of $928 million from fiscal year 2016. The Request supports a diverse portfolio of energy technologies, including renewable electricity, energy efficiency and advanced manufacturing, sustainable transportation, fossil energy, nuclear energy, and a modernized grid.

DOE recently completed the 2015 Quadrennial Technology Review (QTR), a systems-based analytical foundation to inform program research priorities across DOE's entire portfolio of energy and science programs by examining the most promising research, development, demonstration, and deployment (RDD&D) opportunities across energy technologies to effectively address the nation's energy needs. The 2015 QTR builds upon the first QTR conducted in 2011 by describing the nation's energy landscape and the dramatic changes that have taken place over the last 4 years and identifying the RDD&D activities, opportunities, and pathways forward to help address our national energy challenges.

Improving Cost and Performance of Renewable Electricity Technologies

DOE's fiscal year 2017 Budget Request for Energy Efficiency and Renewable Energy (EERE) invests $621 million in renewable energy generation technologies, an increase of $143 million from fiscal year 2016. Innovations, favorable policies, and other factors have led to significant cost and performance improvements across the spectrum of renewable energy technologies, as documented in Revolution . . . Now[1] report. To name a few examples, the cost of utility-scale photovoltaic solar power fell 59 percent from $5.70 per watt in 2008 to $2.34 per watt in 2014; power purchase agreements for wind power fell 66 percent from 7 cents per kilowatt-hour in 2008 to 2.4 cents per kilowatt-hour in 2014; and the median installed price of residential photovoltaic solar power fell 51 percent from $8.80 per watt in 2008 to $4.30 per watt in 2014.

The Request provides $285 million, an increase of $44 million, to continue the SunShot Initiative on a path to achieve solar cost parity without subsidies by 2020. The Budget includes $156 million for Wind Energy, an increase of $61 million, to continue efforts to achieve a 16.7 cents per kilowatt-hour cost target for offshore wind by 2020, including $30 million for offshore wind demonstration projects and $25 million to establish an Offshore Wind R&D Consortium.

[1] http://energy.gov/sites/prod/files/2015/11/f27/Revolution-Now-11132015.pdf.

The Budget Request provides just under $100 million, $29 million above fiscal year 2016, for geothermal technologies, including $35 million to select the final site and team for FORGE, a field laboratory for enhanced geothermal systems, beginning with a down-selection from five to three teams.

The Request also provides $80 million for water power technologies, a $10 million increase, including $25 million to continue the HydroNEXT initiative focusing on innovative, low-cost water diversion technologies to enable new stream reach hydropower, to progress to a cost target of 10.9 cents per kilowatt-hour by 2020 from small, low-head new stream developments. The Request also includes $55 million, $11 million above fiscal year 2016, to support marine and hydrokinetic technologies, including a grid-connected open-water test facility and development of concepts for revolutionary wave-energy converters.

Improving Energy Efficiency and Advanced Manufacturing Technologies

The fiscal year 2017 Budget for EERE includes $919 million, $198 million above fiscal year 2016, to invest in the development of manufacturing technologies and enhanced energy efficiency in our homes, buildings and industries.

In 2015, DOE issued 13 final energy efficiency standards as part of the Administration's goal to reduce carbon pollution. Standards issued to date will achieve cumulative reduction of 2.3 billion metric tons cumulatively by 2030. To accelerate innovation in energy efficiency and manufacturing programs, DOE continues to fund R&D at the Manufacturing Demonstration Facility, funds continuing work at the Critical Materials Institute, and is implementing a total of five Clean Energy Manufacturing Institutes in fiscal year 2016 as part of the National Network for Manufacturing Innovation.

The fiscal year 2017 Budget Request provides $14 million in EERE for the sixth Clean Energy Manufacturing Institute and $25 million to establish a new Energy-Water Desalination Hub to serve as a focal point for enabling technologies for de-energizing, de-carbonizing, and reducing the cost of desalination.

The fiscal year 2017 Budget provides $169 million, an increase of $83 million, for emerging technologies that reduce building energy consumption, including $40 million for an R&D effort to transition to refrigerant technologies with low global warming potential, and the Budget provides $15 million for a new metropolitan systems initiative to use new sensing, communication and computation capabilities to create actionable information for decision-makers on clean energy issues. The Request also provides $230 million, an increase of $15 million, to support weatherization retrofits to approximately 35,700 low-income homes nationwide; $70 million to support State energy offices; and $26 million for a new Cities, Counties, and Communities Energy Program to provide support to local governments, public housing authorities, non-profits and other stakeholders to catalyze more extensive clean energy investments in revitalization efforts.

Advancing Sustainable Transportation

The fiscal year 2017 Budget provides $853 million in discretionary funding, $217 million above fiscal year 2016, for sustainable transportation including vehicle, bioenergy, and hydrogen and fuel cells technologies.

In fiscal year 2016, DOE will achieve high-volume modeled costs for batteries of $250 per kilowatt-hour—down from the current cost of $289 per kilowatt-hour—towards a goal of $125 per kilowatt-hour in 2022 as part of the EV Everywhere Grand Challenge. EERE will initiate SuperTruck II, with up to four new competitively awarded projects to improve freight efficiency of heavy-duty vehicles. The programs will achieve at least 1.15 billion gallons per year savings from Clean Cities' initiatives and fund, with the Departments of Agriculture and Defense, three commercial-scale biorefineries to produce military specification drop-in fuels.

The fiscal year 2107 Budget includes $469 million for vehicle technologies, $159 million above fiscal year 2016, including $60 million to fully fund the multi-year SuperTruck II program to double freight truck efficiency by 2020, and $283 million, an increase of $102 million, for continuing the EV Everywhere program to enable domestic production of plug-in electric vehicles that are as affordable and convenient as gasoline vehicles by 2022. The Budget provides $279 million for bioenergy technologies, $54 million above fiscal year 2016, including $52 million to continue R&D efforts on converting cellulosic and algal-based feedstocks to bio-based gasoline and diesel.

The fiscal year 2107 Budget Request includes an additional $1.3 billion mandatory proposal for DOE to expand investments in low-carbon transportation technologies and fueling infrastructure as part of the Administration's 21st Century Clean Transportation Plan. The proposal for DOE would invest $500 million in clean transportation R&D, $750 million in regional fueling infrastructures for low-

carbon fuels, and $85 million in the deployment of clean vehicle fleets for local governments and first responders.

Crosscutting Innovation Initiatives for Energy

The Request for EERE includes $215 million for new crosscutting innovation initiatives to enable the acceleration of clean energy innovation and commercialization in the United States by strengthening regional clean energy innovation ecosystems, accelerating next-generation clean energy technology pathways, and encouraging clean energy innovation and commercialization collaborations between our National Laboratories and American entrepreneurs.

The Request includes $110 million to support Regional Energy Innovation Partnerships, a new competition to establish regionally-focused clean energy innovation partnerships around the country. These regionally focused and directed partnerships will support regionally relevant technology-neutral clean energy RD&D needs and opportunities to support accelerated clean energy technology commercialization, economic development, and manufacturing.

The fiscal year 2017 Budget Request also includes $60 million for a Next-Generation Innovation funding opportunity to accelerate next-generation clean energy technology pathways by supporting research, development, and demonstration (RD&D) projects with the greatest potential to change the trajectory of EERE core program technology pathways. The Request includes $20 million for a new Small Business Partnerships program to competitively provide technology RD&D resources to small businesses through the DOE's National Labs to support their efforts to commercialize promising new clean energy. The Request also includes $25 million for Energy Technology Innovation Accelerators that will leverage the technical assets and facilities of the National Laboratories to enable American entrepreneurs to conduct RD&D that leads to the creation of new clean energy businesses.

Expanding Transformational ARPA–E Programs

The fiscal year 2017 Budget Request provides $500 million for the Advanced Research Projects Agency—Energy (ARPA–E), which fills a unique role in identifying scientific discoveries and cutting-edge inventions and accelerating their translation into technological innovations. Of this, $350 million is requested in discretionary funding, $59 million above the fiscal year 2016 enacted level, to fund additional early-stage innovative programs as well as to exploit the technological opportunities developed in previous ARPA–E programs.

ARPA–E has achieved considerable results to date. Through early 2015, 141 ARPA–E project teams have completed funded work. Thirty four ARPA–E projects attracted more than $850 million in private sector follow-on funding, and over 30 ARPA–E teams formed new companies. Eight companies had commercial sales of new products resulting from ARPA–E projects, and more than 37 ARPA–E projects partnered with other government entities for further development. At the annual ARPA–E Summit being held this week, we will be announcing updated numbers demonstrating further success with ARPA–E's portfolio of projects.

The fiscal year 2017 Budget Request will expand support for the current core portfolio of early stage innovation programs, including the release of 7–8 funding opportunity announcements (FOA) for new focused technology programs. Possible areas of focus for these FOAs include advanced sensors and analytics for energy management and improved light metals production to transform vehicle lightweighting. The Request also supports the continuation of the Innovative Development In Energy-Related Applied Science (IDEAS) FOA, which provides a continuing opportunity for the rapid support of early-stage applied research to explore innovative new concepts with the potential for transformational and disruptive changes in energy technology. Across all activities, ARPA–E will continue to emphasize supporting commercial readiness for highly successful projects.

In addition, the fiscal year 2017 Budget Request includes a new legislative proposal for the Advanced Research Projects Agency—Energy Trust, which provides $150 million in fiscal year 2017 and a total of $1.85 billion in mandatory funds over 5 years to add a new focus on innovative systems level development that will deliver larger, more rapid benefits to the economic, environmental, and energy security of the United States. These projects are of a different character than can otherwise be funded with annual discretionary appropriations, and include, for example, potentially transformative technologies facing significant technical challenges in scale-up, projects that integrate multiple technical advances, and projects that address system-level transformation of energy cycles. The proposed new mandatory spending authority will accelerate transformational changes on energy systems.

Revitalizing the Nuclear Fuel Cycle

The fiscal year 2017 Budget Request provides $994 million for Nuclear Energy, $8 million above the fiscal year 2016 enacted level, to help meet energy security, proliferation resistance, and climate goals. These funds will to support the diverse civilian nuclear energy programs of the U.S. Government, leading Federal efforts to research and develop nuclear energy technologies, including generation, safety, waste storage and management, and security technologies.

In 2015, the program funded the second 5-year program of the Consortium for Advanced Simulation of Light Water Reactors (CASL) Hub and new R&D programs for two advanced reactor technologies, pebble bed and chloride fast reactors. The fiscal year 2017 Budget Request provides $73.5 million for ongoing R&D in advanced reactor technologies and continued R&D support for light water reactors (LWR), $59 million for accident tolerant fuels, and $35 million for LWR sustainability. Funding is also requested to continue the GAIN initiative to provide streamlined access for advanced reactor developers to access the world-class nuclear energy R&D capabilities at the national laboratories. The Request includes $89.6 million to continue funding for a cost-shared cooperative agreement for licensing technical support of a small modular reactor design, including support for a small modular reactor design (SMR) certification application to the Nuclear Regulatory Commission (NRC) by December 2016, for application review by the NRC, and to continue development of permit and license applications for the first domestic SMR deployments.

In 2015, DOE's nuclear energy program awarded a contract for a deep borehole field characterization test and issued an Invitation for Public Comment to initiate the dialogue on a consent-based siting process to support a consolidated commercial used fuel storage, a permanent repository and a separate disposal path for defense waste. The Request continues implementation of the Administration's Strategy for the Management and Disposal of Used Nuclear Fuel and High Level Radioactive Waste by providing $76.3 million, an increase of $53.8 million, for integrated waste management system activities in the areas of transportation, storage, disposal, and consent-based siting. The Request includes $39.4 million for consent-based siting, including $25 million for grants to States, Tribes, and local governments. The Request also includes $26 million to complete characterization of a field test borehole and to initiate drilling.

Enabling Fossil Energy to Compete in a Low-Carbon Energy Future

The Budget Request provides $600 million for Fossil Energy Research and Development ($240 million of which is available through repurposing of prior-year balances), $32 million below the fiscal year 2016 enacted level, to advance research and development in carbon capture and storage, advanced energy systems, cross-cutting areas, and fuel supply impact mitigation.

In fiscal year 2016, DOE is reaching several milestones in its support for carbon capture, utilization and storage (CCUS). DOE completed funding of two large-scale industrial CCUS projects that are in operation to demonstrate the feasibility and economics of carbon capture on an ethanol facility and the technology for carbon capture on a hydrogen production unit. Through cost-shared cooperative agreements, DOE is supporting two large-scale, coal-based CCUS demonstration projects utilizing coal gasification and post-combustion carbon capture technologies, with construction to be completed in 2016.

The fiscal year 2017 Budget Request provides $50 million, an increase of $20 million, to support initial construction of three large-scale pilot projects of advanced, second generation, post combustion carbon capture technologies critical to reducing cost and increasing efficiency of CCUS technologies. The Request includes $24 million to initiate the design and construction of a supercritical carbon dioxide (CO?) pilot plant test facility at the 10 megawatt-electric (MWe) scale, and $31 million to initiate design of a natural gas combined cycle (NGCC) demonstration facility employing CCUS technology.

The budget includes the reallocation of funding from CCUS demonstration projects that have not reached financial close to fund other projects and new initiatives, including the use of $240 million in prior-year balances.

Also in support of CCUS technologies, the President's fiscal year 2017 Budget Request makes available $5 billion in proposed investment and sequestration tax credits for qualified commercial CCUS projects. These tax credits are complemented by an existing $8.5 billion available through DOE's loan guarantees for advanced fossil energy projects to help provide critical financing to support new or significantly improved advanced fossil energy projects, and additional mixed-use authority for loan guarantees in the fiscal year 2017 Budget that can be used for advanced fossil and other technologies.

Expanding Technology Commercialization and Deployment

Significant advances have been made in recent years in commercializing and deploying innovative technologies have been made. In 2015, DOE received 30 out of 100 R&D Magazine awards for outstanding technology developments with promising commercial potential, and the Administration announced new investment commitments from the institutional investment community of $4 billion for deployment of clean energy technologies. The renewable energy production tax credits were also extended by the Congress in December 2015.

To expand the commercial impact of DOE's portfolio of research, development, demonstration, and deployment activities in the short, medium and long term, DOE established the Office of Technology Transitions (OTT) in 2015 to oversee and advance DOE's technology transfer mission. The fiscal year 2017 Budget Request provides $8.4 million for the OTT to expand the commercial impact of the DOE portfolio of activities. The Request provides for coordination of technology-to-market activities across the Department and the implementation of the Technology Commercialization Fund (TCF), approximately $20 million in fiscal year 2017, to catalyze seed-stage funding for collaborations with private sector partners on high potential energy technologies at the National Laboratories. The Budget Request for OTT also supports implementation of the Clean Energy Investment Center (CEIC) to provide better information on investable opportunities resulting from DOE R&D.

DOE's Loan Programs Office, in its role accelerating the domestic commercial deployment of innovative and advanced clean energy technologies, has maintained a financially sound portfolio of loans and loan guarantees. The $32 billion portfolio of loans, loan guarantees, and conditional commitments has been supported by $18 billion in financing from project sponsors, and 22 projects with DOE-backed loans and loan guarantees have now successfully completed construction and initiated operation. DOE has received new applications seeking over $20 billion in Advanced Technology Vehicles Manufacturing (ATVM) and Title XVII loans and loan guarantees.

The fiscal year 2017 Budget Request supports the Department's continued oversight of more than $30 billion in loans, loan guarantees, and conditional commitments, as well as its administration of remaining loan and loan guarantee authority to finance projects in the areas of advanced nuclear energy, renewable energy and efficient energy, advanced fossil energy, and advanced technology vehicles manufacturing. The fiscal year 2017 Request also proposes an additional $4 billion of mixed-use loan guarantee authority for innovative energy projects that reduce greenhouse gas emissions.

The fiscal year 2017 Request also includes $23 million for the Office of Indian Energy, $7 million above the fiscal year 2016 enacted level, to support DOE's partnership with the Department of the Interior to address the need for clean, sustainable energy systems on Indian lands through expanded technical assistance and grant programs.

Enabling Secure, Modern, and Resilient Energy Infrastructures

The Department's energy programs also support a secure, modern and resilient energy infrastructure, including for the electric power grid. The fiscal year 2017 Budget Request continues a focus on this mission by providing increased investments in the electricity grid of the future.

DOE has also taken major steps in implementing the Grid Modernization Initiative, supported by a Grid Modernization National Laboratory Consortium comprising 400 partners, including the release of DOE's new comprehensive new Grid Modernization Multi-Year Program Plan and the announcement of a $220 million funding opportunity for the National Labs and partners.

The fiscal year 2017 Budget Request includes $262 million for Electricity Delivery and Energy Reliability, $56 million above the fiscal year 2016 enacted level, for grid modernization research to support a smart, resilient electric grid for the 21st century and the storage technology that underpins it, as well as funding critical emergency response and grid physical security capabilities. The Request provides $14 million to establish a new competitively-selected Grid Clean Energy Manufacturing Innovation Institute as a part of the multi-agency National Network for Manufacturing Innovation, to focus on technologies related to critical metals for grid application, and advances will be broadly applicable in multiple industries and markets.

The Request for Electricity Delivery and Energy Reliability also provides $45 million for energy storage R&D, an increase of $24 million, and $30 million for smart grid R&D. To fortify grid security and resilience, the Request includes $46 million to advance cybersecurity technologies and $18 million for infrastructure security and energy restoration activities. The Request provides $15 million for a new State energy assurance program that supports regional and State activities to continually

improve energy assurance plans, improve capabilities to characterize energy sector supply disruptions, communicate among the local, State, regional, Federal, and industry partners, and identify gaps for use in energy planning and emergency response training programs. The Request also provides $15 million to launch a new State distribution-level reform program for competitive awards to States to utilize a grid architecture approach to address their system challenges.

The Budget Request also includes $257 million for the Strategic Petroleum Reserve (SPR), $45 million above the fiscal year 2016 enacted level, to increase the system's durability and reliability and ensure operational readiness. The Bipartisan Budget Act of 2015 requires the Department to submit to Congress a Strategic Review of the SPR by May, 2016. The Act also authorized DOE, subject to appropriation, to sell up to $2 billion in SPR oil to fund SPR infrastructure modernization. The results of the SPR Strategic Review will inform SPR infrastructure modernization and shall result in an fiscal year 2017 budget amendment related to SPR modernization.

The fiscal year 2017 Budget Request provides $31 million for Energy Policy and Systems Analysis to continue serving as a focal point for policy coordination within the Department on the formulation, analysis, and implementation of energy policy and related programmatic options and initiatives that could facilitate the transition to a clean and secure energy economy.

EPSA also serves as the Secretariat of the multi-agency Quadrennial Energy Review (QER), and provides systems analysis to support this Administration's initiative. The Administration expects to complete the second installment of the QER in 2016, focused on the electricity sector.

The Budget Request also includes $84 million for the power marketing administrations, including the Western Area, Southeastern, Southwestern, and Bonneville Power Administrations.

Enhancing Collective Energy Security in Global Energy Markets

While DOE's work in global energy security is not a major budgetary issue, it is an important issue for the Nation. DOE has pursued an increased global focus on collective energy security— energy security for the United States and its allies—in the last several years.

For example, as part of this effort and supported by our Office of International Affairs, the G–7 recently reached an agreement to enhance cybersecurity assessments of energy systems. The fiscal year 2017 Budget Request supports DOE's efforts to enhance collective energy security by providing $19 million for the Office of International Affairs, which coordinates the Department's activities to strengthen international energy technology, information and analytical collaborations.

In the area of energy exports, DOE has released a two-part LNG export study for public comment evaluating the impact of increasing LNG exports from 12 billion cubic feet per day (Bcf/d) to 20 Bcf/d. The study will be used in the public interest evaluation of pending applications to export LNG to non-FTA countries. DOE also chaired the International Energy Agency Ministerial resulting in a plan to assess energy security implications of natural gas supply.

Following the North American ministerial in 2014, Canada, Mexico, and the United States have worked together to produce new integrated mapping and information products. The Budget Request for the Energy Information Administration provides $131 million, a $9 million increase, to build upon enhancements like these in carrying out EIA's data collection and analysis mission.

The increase will provide greater regional detail and analysis of petroleum data, enhance commercial building energy efficiency data. The Budget will also extend analysis of international data to include Canada-Mexico collaboration and Asia and expand collection of transportation energy consumption data.

NUCLEAR SECURITY

The President's 2015 National Security Strategy, the 2010 Nuclear Posture Review (NPR), and the ratification of the New Strategic Arms Reduction Treaty underscored the importance of the DOE's nuclear mission and the lasting mandate for DOE to maintain a safe, secure, and effective stockpile for as long as nuclear weapons exist. DOE advances the President's vision to eliminate and secure nuclear material, reduce nuclear stockpiles, and increase global cooperation.

The fiscal year 2017 Budget Request proposes $12.9 billion for the National Nuclear Security Administration (NNSA), $357 million above the fiscal year 2016 enacted level, to invest in our nuclear security by modernizing and maintaining our nuclear security enterprise, refurbishing and extending the life of our nuclear deterrent, reducing the threats of nuclear proliferation, and supporting the safe and reliable operation of our nuclear Navy. As part of an overall focus to modernize nuclear

security research and production infrastructure, the overall NNSA budget includes a total of $1.8 billion in proposed infrastructure investments, including $575 million for the new Uranium Processing Facility.

The Request for NNSA includes $413 million for NNSA Federal Salaries and Expenses for the salary, benefits, and support expenses of 1,715 Federal full-time equivalents (FTEs) to provide appropriate Federal oversight of the nuclear security enterprise responsible for managing and executing NNSA's weapons activities and nonproliferation missions.

Stewardship of the Nuclear Deterrent

August of 2015 marked the 20th anniversary of President Bill Clinton's announcement that the United States would pursue negotiations for the Comprehensive Nuclear-Test-Ban Treaty and maintain the U.S. nuclear arsenal without nuclear explosive tests. This was an important milestone for a science-based Stockpile Stewardship Program that successfully pushed the limits of modern science and engineering to maintain the stockpile without underground nuclear explosive testing.

The fiscal year 2017 Budget Request includes $9.2 billion for Weapons Activities, $396 million above the fiscal year 2016 enacted level, to build on these accomplishments as NNSA sustains a credible and effective nuclear deterrent while continuing to reduce the size of the active stockpile. The Budget Request supports the work, as laid out in the Stockpile Stewardship and Management Plan, of the science-based Stockpile Stewardship Program to ensure a safe, secure and effective nuclear stockpile in the absence of underground nuclear explosive testing through a sustained, long-term research program.

NNSA has achieved major accomplishments in that mission, such as substantial progress on its Life Extension Programs (LEPs), including those for the B61–12, W76–1, W80–4, and W88 Alt 370 with conventional high explosive (CHE) refresh. The Inertial Confinement Fusion Ignition and High Yield Program increased the number of experiments, or "shot rate," at Lawrence Livermore National Laboratory's National Ignition Facility from 191 in 2014 to 356 in 2015. NNSA received the first hardware delivery for Trinity, NNSA's next generation high performance computer, and completed the first subproject for the Uranium Processing Facility, Site Readiness, on time and under budget.

The fiscal year 2017 Request includes $1.3 billion for LEPs and major alterations (Alts), $38 million above fiscal year 2016. In particular, the Request continues timely execution of the B61–12 LEP and the W80–4 LEP. These are the first two steps in implementing the Nuclear Weapons Council-approved "3 + 2" strategy to consolidate the stockpile to three ballistic missile warheads and two air delivered systems, reducing the number of weapons in the deployed stockpile and simplifying maintenance requirements.

The Request provides $223 million to support completing production of the W76 by 2019 and $616 million to deliver the B61–12 first production unit by 2020. It also supports transitioning the W88 Alt 370 with CHE refresh to Production Engineering in February 2017 with $281 million and provides $220 million, an increase of $25 million, to maintain the schedule of the first production unit for the W80–4 LEP by 2025. The Budget Request also provides $69 million, $17 million above the fiscal year 2016 enacted level, to make progress towards meeting the President's commitment to accelerate dismantlement of retired U. S. nuclear warheads by 20 percent.

The Budget Request for Weapons Activities provides $2.7 billion for Infrastructure and Operations, $443 million above fiscal year 2016. The Request ensures no increase in the backlog of deferred maintenance. The Request will dispose of the Kansas City Bannister Federal Complex, and upgrade aging infrastructure to address safety and programmatic risks, improve productivity, and lower operating costs. The Request for Infrastructure and Operations also provides $575 million, $145 million above fiscal year 2016, to continue the phased approach for constructing the Uranium Processing Facility, including completion of the design and continued construction on approved subprojects. The request also provides $160 million to continue work on the Chemistry and Metallurgy Research Replacement project to support the plutonium strategy.

As part of the Office of Science-NNSA collaboration on the Exascale Computing Initiative, the Budget includes $95 million for exascale computing, $31 million or 48 percent above fiscal year 2016, to develop exascale-class high performance computing to meet the needs for future assessments, LEPs, and stockpile stewardship.

The Request for Weapons Activities also includes $283 million for Secure Transportation Asset, $46 million above fiscal year 2016, to continue asset modernization and workforce capability initiatives including conceptual design and systems prototyping of the new Mobile Guardian Transporter.

Controlling and Eliminating Nuclear Materials Worldwide

The fiscal year 2017 Budget Request includes $1.8 billion for Defense Nuclear Nonproliferation, $132 million below the fiscal year 2016 enacted level, to continue the critical missions of securing or eliminating nuclear and radiological materials worldwide, countering illicit trafficking of these materials, preventing the proliferation of nuclear weapon technologies and expertise, ensuring that the United States remains ready to respond to high consequence nuclear and radiological incidents at home or abroad, and applying technical and policy solutions to solve nonproliferation and arms control challenges around the world. Note that while the overall program level for DNN is down, the programmatic funding level in the fiscal year 2017 Budget Request is roughly flat with fiscal year 2016 due to the availability of prior-year carryover balances and termination of the Mixed-Oxide (MOX) Fuel Fabrication Facility Project.

DOE has taken major steps in the nuclear threat reduction missions. We recently issued the first nonproliferation strategic plan, Prevent, Counter and Respond—A Strategic Plan to Reduce Global Nuclear Threats,[2] to define and describe our missions.

Supported largely by the DNN program and capabilities, we also provided scientific technical analysis to support the U.S. delegation during the Joint Comprehensive Plan of Action (JCPOA) negotiations. Following finalization of the agreement, twenty nine scientific leaders deeply familiar with nuclear issues (familiar names such as Garwin, Drell, Dyson, Hecker, Richter, and others), focusing on the agreement's nuclear dimensions, wrote to the President: "This is an innovative agreement, with much more stringent constraints than any previously negotiated nonproliferation framework." These experts were referring to aspects of the agreement such as weaponization constraints and bans on nuclear weapons R&D that mark an unprecedented approach to such agreements—and highlight the critical role that DOE plays in providing unparalleled scientific and technical capabilities.

As part of NNSA's goal to minimize and, when possible, eliminates weapons-usable nuclear material around the world, we have also recently completed removal or confirmed disposition of fissile nuclear material, bringing the number of countries free of all highly enriched uranium (HEU) to 28, plus Taiwan. We have also down-blended additional HEU to achieve a cumulative total of 150 metric tons of U.S. excess, weapons-usable HEU.

And in the area of nuclear counterterrorism and incident response, NNSA realigned its counterterrorism and counterproliferation functions to more efficiently respond to nuclear or radiological incidents worldwide and to sustain counterterrorism capabilities through innovative technology and policy-driven solutions. The program continues to train and exercise to strengthen emergency preparedness and response capabilities, including nuclear forensics operations, domestically and worldwide.

Looking ahead, the fiscal year 2017 Budget Request will support continued successful execution of the mission to control and eliminate nuclear materials worldwide. NNSA will support the President's fourth and final Nuclear Security Summit in March-April 2016, continuing the President's aim to achieved tangible improvements in the security of nuclear materials and stronger international institutions that support nuclear security.

DOE and its national laboratories will continue to provide technical support to the International Atomic Energy Agency (IAEA), including to implement the JCPOA, and will remain highly engaged in providing training and technologies and other support to support the IAEA. The Request includes $13 million to support implementation of the JCPOA, including $10 million to support JCPOA material management activities and $3 million for technical and in-kind support for the U.S. interagency process and the IAEA.

In the area of plutonium disposition, the Budget Request will terminate the Mixed Oxide (MOX) approach and move to a dilute and dispose approach that will be faster and significantly less expensive than the MOX option. Specifically, the fiscal year 2017 Budget Request provides $270 million, $70 million below fiscal year 2016, to terminate the MOX Fuel Fabrication Facility, and an additional $15 million to pursue a dilute and dispose (D&D) approach that will disposition surplus U.S. weapon-grade plutonium by diluting it and disposing of it at a geologic repository. The Department will complete pre-conceptual design for the D&D option and begin conceptual design in late fiscal year 2017.

In other nonproliferation areas, the Request includes $272 million, $37 million above fiscal year 2016, to sustain emergency response and nuclear counterterrorism

[2] http://nnsa.energy.gov/sites/default/files/NPCR%20Report__FINAL__4–14–15.pdf.

capabilities that are applied against a wide range of high-consequence nuclear or radiological incidents and threats. It proposes $394 million for the Defense Nuclear Nonproliferation Research and Development program to advance technical capabilities to monitor foreign nuclear weapons program activities, diversion of special nuclear material, and nuclear detonations. The Request provides $341 million for Material Management and Minimization to support HEU and plutonium disposition, the conversion of research reactors and medical isotope production facilities from the use of HEU to the use of low enriched uranium (LEU) fuels and targets, and removal of excess HEU and separated plutonium. The Request also provides $337 million for Global Material Security to build international capacity to secure, and prevent smuggling of, nuclear and radiological material through equipment installations and upgrades, and capacity-building workshops and trainings. In addition, the Request provides $125 million for the Nonproliferation and Arms Control program to strengthen the nonproliferation and arms control regimes by enhancing international nuclear safeguards; controlling the spread of nuclear material, equipment, technology, and expertise; and verifying nuclear reductions and compliance with nonproliferation and arms control treaties and agreements.

Advancing Navy Nuclear Propulsion

Finally for NNSA, the Naval Reactors program continues its tradition of providing the design, development and operational support required to provide militarily effective nuclear propulsion plants and ensure their safe, reliable and long-lived operation. In carrying out this mission, the Naval Reactors program has marked many major accomplishments.

The program continues to provided technical support and 24/7 reachback support for the Navy's nuclear fleet of 73 submarines and 10 aircraft carriers. The program successfully achieved criticality in the first reactor of the new Gerald R. Ford-class aircraft carrier, and continued reactor plant design for the Ohio-class submarine replacement and advanced technology development in refueling of S8G land-based prototype reactor, including the insertion of new materials and technology for the Ohio-class submarine replacement. Naval Reactors also operated the MARF (Modifications and Additions to a Reactor Facility) and S8G land-based prototype reactors, delivering 2,832 trained nuclear operators to the fleet—a 17 percent increase over fiscal year 2014.

The Request includes $1.4 billion for Naval Reactors, an increase of $45 million from the fiscal year 2016 level, to support U.S. Navy nuclear propulsion. The Request provides $214 million to continue development of the Ohio-class submarine replacement reactor, and $124 million to continue refueling of the Land-Based Prototype reactor.

In support of necessary facilities for handling naval spent nuclear fuel, including the capability to receive, unload, prepare, and package naval spent nuclear fuel, the Request provides $100 million to complete design and initiate construction of a new Spent Fuel Handling Recapitalization Project at Naval Reactors Facility in Idaho.

MANAGEMENT AND PERFORMANCE

The fiscal year 2017 Budget Request provides $6.8 billion for Departmental management, performance, and related corporate support activities to position the Department to meet the nation's Manhattan Project and Cold War legacy responsibilities and to continue institutionalizing an enterprise-wide focus on improving the efficiency and effectiveness of DOE programs through the effective management of DOE's infrastructure and workforce.

Strengthening Project Management

The Department is aggressively pursuing implementation of a Secretarial initiative to improve project management. We have made progress to that end through several recent initiatives and reforms, including establishing independent project review capabilities within each Under Secretary organization, as well as a central Project Management Risk Committee (PMRC). We have also formalized the role of the Energy Systems Acquisition Advisory Board (ESAAB) and instituted process changes to ensure that the ESAAB takes a proactive role in reviewing major projects. In addition, we established a new independent office on project management oversight and assessments.

It is notable the Government Accountability Office (GAO) has narrowed the focus of its watch list to DOE's major projects, and we continue to work towards improving our implementation of those projects. The Department's continuing goal is to control costs to within 10 percent of the baseline estimate for at least 90 percent of our construction projects.

The fiscal year 2017 Budget Request includes several proposals to further implement these project management improvements. The Request provides $18 million for the independent office of Project Management Oversight and Assessments (PMOA). With senior management focus on DOE's total project portfolio, DOE will be able to hold contractors and programs accountable for large and at-risk projects, receiving early warning notifications and quarterly updates.

The Budget Request also includes $5 million to establish an independent office, similar to that at the Department of Defense, to set cost estimating policy and provide timely unbiased program evaluation analysis and cost estimation.

Cleaning up Nuclear Legacy Waste

The fiscal year 2017 Budget Request includes $6.1 billion for Environmental Management (EM), $99 million below the fiscal year 2016 enacted level, to address its responsibilities for the cleanup of large quantities of liquid radioactive waste, spent nuclear fuel, contaminated soil and groundwater, and deactivating and decommissioning excess facilities used by the nation's nuclear weapons program. The $6.1 billion Request includes $5.4 billion in discretionary funding and proposes $674 million in mandatory funding from the USEC Fund, for Uranium Enrichment Decontamination and Decommissioning (UED&D) Fund activities.

While difficult challenges lie ahead with some of our remaining Environmental Management projects, it is important to note that when the program started, there were 107 sites to be closed— and today we have cleaned up all but 16 sites. The remaining sites will not be simple to remediate, but we started with over 3,000 square miles to remediate, and only 300 square miles remain.

In our ongoing efforts to remediate our legacy sites, we have continued construction activities necessary to initiate direct feed of Low Activity Waste (LAW) at Hanford, and we have continued technical issue resolution of the Pretreatment and High Level Waste facilities at the same site. We have cleaned up and demolished more than 800 facilities at Hanford, and we have remediated over 1,200 waste sites along the River Corridor. At the Savannah River Site, we have closed the seventh waste tank, and we have revitalized the EM Technology Development and Deployment Program in response to a Secretary of Energy Advisory Board (SEAB) recommendation.

Looking forward, the fiscal year 2017 Budget Request includes $271 million to maintain critical progress toward resuming waste emplacement in the underground at the Waste Isolation Pilot Plant (WIPP) by the end of 2016. WIPP, the Nation's only mined geologic repository for the permanent disposal of defense-generated transuranic waste, suspended operations following a February 5, 2014 fire involving an underground vehicle and an unrelated radioactive release that occurred February 14, 2014. The Request for WIPP includes activities to resume waste emplacement operations by the end of 2016, including continued implementation of corrective actions and safety management program improvements, completion of Operational Readiness Reviews and commencement of waste emplacement operations. Activities include mine stabilization, mining, mine habitability activities in all underground areas, continued decontamination of contaminated areas, and upgrades, support for completion of repairs of New Mexico Roads used for the transportation of DOE shipments of transuranic waste to WIPP, and community and regulatory support. The budget supports the Central Characterization Project and maintains shipping capability between the generator sites and WIPP. The Request also includes funding to support progress in design of a new permanent ventilation system that is needed to support normal operations.

The fiscal year 2017 Budget Request provides $1.5 billion for the Office of River Protection, $86 million above the fiscal year 2016 enacted level, to support the Department's proposal to amend the Consent Decree between DOE and the State of Washington for completion of the Waste Treatment and Immobilization Plant and retrieval of waste from 19 Single Shell Tanks. The Budget Request would enable construction of a new facility to allow DOE to begin treating low level waste by the end of 2022, avoiding the need to wait for completion of other facilities affected by the technical issues. The Request continues construction of the low activity waste (LAW) facility, the analytical laboratory, and balance of facilities while addressing technical issues with the pretreatment facility and the high-level waste facility as well as support for the planning and design of the LAW pretreatment system at the tank farms.

The Request also provides $800 million for cleanup of the Richland Site. Cleanup activities include soil and groundwater remediation, facility decontamination and decommissioning, stabilization and disposition of nuclear materials and spent nuclear fuel, and disposition of waste other than the tank waste managed by the Office of River Protection. The fiscal year 2017 Request for Richland will provide for con-

tinued achievement of important cleanup progress required by the Tri-Party Agreement. The Budget Request for Richland supports completion of cleanup at the Plutonium Finishing Plant, planning and initiation of procurement in preparation for cleanup of the 324 site, and other activities. The decrease of $191 million from fiscal year 2016 is attributed to completed scope and facility modifications to prepare for installation of sludge removal systems for the K West Basin, as well as purchase of the engineered containers for sludge repackaging; and completion of remediation in the 300 area, 100K area and 618–10 trenches.

The Request provides $1.5 billion, $111 million above fiscal year 2016, for the Savannah River Site to support remaining construction and commissioning of the Salt Waste Processing Facility, processing 19 million gallons of salt waste and nuclear materials in H-Canyon, and site-wide infrastructure. The Request will ramp up commissioning of the Salt Waste Processing Facility to enable start-up in 2018. The Request devotes significant funding to support the Liquid Tank Waste Management Program, as the liquid waste tanks pose the highest public, worker, and environmental risk at the site. The Request also supports the Savannah River Site to operate H Canyon in a safe and secure manner, provides safe, secure storage for spent (used) nuclear fuel in L-Area, and supports continuity of K-Area operations to include maintaining K-Area to store special nuclear material safely and securely. The increase over fiscal year 2016 provides additional support leading to startup of Salt Waste Processing Facility in 2018; supports tank closure and bulk waste removal activities to meet fiscal year 2016 enforceable milestones; and provides additional funding for Salt Disposal Unit #7 design activities.

The fiscal year 2017 Budget Request includes $370 million, $32 million below fiscal year 2016, for the Idaho Site to support key requirements to continue progress in meeting the Idaho Settlement Agreement commitments. The Idaho Cleanup Project is responsible for the treatment, storage, and disposition of a variety of radioactive and hazardous waste streams, including removal and disposition of targeted buried waste sitting above the Snake River Plain Aquifer. The project is also responsible for removing or deactivating unneeded facilities, and removing DOE's inventory of spent (used) nuclear fuel and high-level waste from Idaho. The Request will continue retrieval and processing of transuranic waste via the Advanced Mixed Waste Treatment Project and the Remote-handled Waste Disposition Project. It will also support continued progress toward closing the tank farm, including continued treatment and disposition of sodium bearing waste and progress toward buried waste exhumation under the Accelerated Retrieval Project. The decrease from the fiscal year 2016 level is attributed to progress in treatment, packaging, and certification of Idaho Settlement Agreement remote-handled transuranic waste, delays in processing waste at the Integrated Waste Treatment Unit, and a one-time funding increase in fiscal year 2016 for procurements.

The fiscal year 2017 Budget Request provides $391 million for cleanup at the Oak Ridge site, including $178 million in proposed mandatory funding, to support direct shipments of Uranium Solidification Project material, continue design and construction of the Mercury Treatment Facility, continue contact- and remote-handled debris processing at the Transuranic Waste Processing Facility, and continue the K–27 Decontamination and Decommissioning project. The Request will maintain the facilities in a safe, compliant, and secure manner as well as operate waste management facilities. The Request will continue development of Comprehensive Environmental Response, Compensation and Liability Act documentation for the new On-Site Disposal Facility. The processing of legacy transuranic waste debris will continue at the Transuranic Waste Processing Center and technology maturation and design will continue for the Sludge Processing Facility Buildout project. Additionally, the Request supports direct disposition of Consolidated Edison Uranium Solidification Project material from Building 3019, assuming resolution of stakeholder concerns.

The Budget Request includes $323 million, including $258 million in proposed mandatory funding, to support the deactivation and decommissioning project at the Portsmouth Gaseous Diffusion Plant in Piketon, Ohio. In addition to supporting deactivation and decommissioning of gaseous diffusion plant facilities and systems, disposal of waste, small equipment removal, and other related activities, the request also includes funding for design and construction of a potential on-site landfill for the disposal of waste generated from the demolition of the Portsmouth Gaseous Diffusion Plant and associated facilities. In addition, the Request will continue the safe operation of the DUF6 Conversion facility that converts depleted uranium hexafluoride into a more stable depleted uranium oxide form suitable for reuse or disposition. The Request for the Portsmouth is supplemented by continuing transfers of uranium for cleanup services at the Portsmouth Gaseous Diffusion Plant.

The Request provides $272 million for the Paducah site, including $208 million in proposed mandatory funding, for a multifaceted portfolio of processing and clean-

up activities. In addition to ongoing environmental cleanup and DUF6 operations, the Budget Request supports activities to continue the environmental remediation and further stabilize the gaseous diffusion plant, including uranium deposit removal, facility modifications, surveillance and maintenance, and activities to remove hazardous materials. The Request supports the design of the Paducah potential On-Site Waste Disposal Facility project, if the project is selected as the appropriate remedy.

The fiscal year 2017 Budget Request includes $30 million to expand the technology development program through carefully targeted projects to develop and demonstrate new technologies and approaches tailored to the specific contamination issues at individual sites. The fiscal year 2017 Budget Request includes an emphasis on robotics research and development of test beds in support of DOE's cleanup mission.

Refinancing Uranium Enrichment Decontamination and Decommissioning

Continued progress towards decontaminating, decommissioning, and remediating the former gaseous diffusion uranium enrichment sites, and towards meeting our uranium/thorium reimbursement commitments, remains a priority for DOE. We have made significant strides at the Oak Ridge, Portsmouth, and Paducah sites, but we have an estimated $22–24 billion in remaining cleanup costs.

Throughout the history of these sites, the government has collected funds from the public and private entities that utilized the enriched uranium produced at the facilities to pay for operation, privatization, and cleanup of these three sites—some provided by utility fees, and others provided by Congress. Three government accounts— Uranium Enrichment Decontamination and Decommissioning Fund, Uranium Supply and Enrichment Activities Account, and the United States Enrichment Corporation (USEC) Fund—hold nearly $5 billion of these funds.

The fiscal year 2017 Budget Request proposes to make progress on our cleanup missions at Paducah, Portsmouth, and Oak Ridge, and the Title X Uranium/Thorium Reimbursement Program by harnessing some of these funds through a mandatory proposal to make available $674 million from the United States Enrichment Corporation Fund.

Through the Energy Policy Act of 1992, Congress authorized annual deposits to the Uranium Enrichment Decontamination and Decommissioning (UED&D) Fund from an assessment on nuclear utilities for 15 years—from fiscal years 1993 through 2007. The Budget Request proposes to reinstate these fees to offset proposed new mandatory spending for uranium enrichment cleanup. The Budget also includes $155 million of defense funding for deposit into the UED&D Fund, reflecting the shared responsibility of both industry and the Federal Government for these costs.

Investing in Departmental Infrastructure

The fiscal year 2017 Budget Request supports safe and reliable world class facilities by investing in new infrastructure in all mission areas and establishing a sustainable trajectory for the Department's existing infrastructure.

As part of our effort to manage the enterprise's infrastructure in a sustainable manner to support DOE missions, beginning in fiscal year 2016, we have implemented a policy to halt increases in deferred maintenance across the DOE complex. We have also taken steps to bolster DOE's enterprise-wide inventory by compiling the first uniform assessment of general purpose infrastructure at all National Laboratories and NNSA plants and sites through the National Laboratory Operations Board (LOB), and forming a LOB working group to assess and prioritize the disposition of excess facilities.

Building on these efforts, the fiscal year 2017 Budget Request continues a comprehensive program of infrastructure modernization and improved maintenance across the complex, including expanded funding for general purpose infrastructure projects. The Budget proposes, for example, $200 million for the disposal of the Kansas City Bannister Federal complex. Finally, we are seeking to improve the energy efficiency and sustainability of government facilities, including use of Energy Savings Performance Contracts.

Building and Supporting the Energy Workforce

DOE's continues to work to attract, manage, train and retain the best workforce to meet its future mission needs.

In support of managing the workforce and hiring new personnel, we have activated two Consolidated Human Resources (HR) Service Centers, at Cincinnati and Oak Ridge, as part of a new service delivery model to consolidate 17 current HR service centers to five, which should allow for a more efficient and effective HR model across DOE. The fiscal year 2017 Budget Request completes the HR Shared Services Centers consolidation and invests in implementing recommendations re-

sulting from a talent management study conducted in fiscal year 2016, which will help to develop a corporate approach to talent acquisition in order to consistently and effectively attract, develop, and retain the best workforce to meet mission needs.

The DOE Office of the Chief Information Officer (CIO) and related offices continue to build the information technology (IT) infrastructure in support of DOE's mission needs. DOE is expanding Multifactor Authentication Program for improved cyber security. The fiscal year 2017 Budget Request strengthens cybersecurity across the enterprise with an investment of $285 million, an increase of $23 million across 13 offices and the Working Capital Fund.

The $93 million fiscal year 2017 Budget Request for CIO, $20 million above fiscal year 2016, also supports several critical IT improvements, including implementation of Federal Information Technology Acquisition Reform Act (FITARA) requirements to provide a common baseline for roles, responsibilities, requirements, and authorities for the management of IT in Federal civilian agencies. The Request also includes efforts to modernize and further secure the Department's IT infrastructure, including core networking layers, data centers, and access technologies.

The Department has established a Labor-Management Forum to further encourage opportunities for collaboration and partnership between contractors and management.

The Department has established the Office of Energy Jobs Development, consolidating ongoing activities across the Department formerly coordinated via the Jobs Strategy Council. The Request includes $3.7 million to support the office and to compile survey data and deliver the energy jobs and workforce report that would detail job growth/shifts in the energy and advanced manufacturing industries; fill the gaps that currently exist in data gathering on renewable energy, energy efficiency, and advanced manufacturing jobs; and compile data on energy job skill needs of employers and public agencies.

ADVANCING DOE'S CRITICAL MISSIONS

In conclusion, the fiscal year 2017 Budget Request of $32.5 billion invests in its science and technology capabilities, its workforce, and its critical infrastructure to advance DOE's core missions.

The Request supports the Department's efforts in science and energy to enable a clean energy future through innovative lower-cost energy technologies; to support secure, modern and resilient energy infrastructure and emergency response capabilities; and to provide the backbone for discovery and innovation, especially in the physical sciences, for America's research community.

The Request invests in the Department's nuclear security missions to maintain a safe, secure, and effective nuclear deterrent without nuclear explosive testing; to modernize the nuclear security research and production infrastructure; to reduce global nuclear security threats; and to propel our nuclear Navy.

And the Request continues taking steps to further the Department's management and performance missions to clean up from the Cold War legacy of nuclear weapons production; to manage infrastructure in a sustainable manner to support DOE missions; and to attract, manage, train and retain the best workforce to meet mission needs.

Thank you, and I would be pleased to answer your questions.

Senator ALEXANDER. Thanks, Mr. Secretary. We have good attendance. We will go right to questions and take 5-minute rounds. But if Senators want to stay and ask a second 5-minute round of questions, we will provide time for that.

OFFICE OF SCIENCE FUNDING

Let me begin, Mr. Secretary. I am for doubling energy research, but that costs about $5 billion. I mean, if we doubled the energy research in the Office of Science, that would be going from about $5 billion to about $10 billion. Is that about right?

Secretary MONIZ. About 20 percent of the Office of Science budget is part of the Mission Innovation base.

Senator ALEXANDER. But generally speaking.

Secretary MONIZ. If the Office of Science as a whole were doubled——

Senator ALEXANDER. No, no, I am talking—the amount of Federal Government energy research is about $5 billion. Is that about right?

Secretary MONIZ. Well, we have $4.8 billion in DOE (Department of Energy) and $6.4 billion across the government.

Senator ALEXANDER. So it is about $5 billion in DOE. If we double that, that would be $10 billion, just the Energy part. We are talking here about where we find the money.

ENERGY SUBSIDIES

But we are subsidizing windmills for the 23rd year at $4 billion. Two decades ought to be long enough to turn that into a mature technology.

We have $24 billion in subsidies for oil and gas over the next 10 years.

Why isn't a place to get the money for doubling clean energy research by phasing out subsidies to mature technologies? Why shouldn't we do that?

Secretary MONIZ. Well, they are certainly different levels of maturity. The administration has supported the idea of reducing and eliminating many of the fossil fuel subsidies.

Senator ALEXANDER. What about the windmills? They do not produce much energy, and 22 or 23 years ought to be long enough to allow them to be competitive. That is $4 billion over 10 years right there.

Secretary MONIZ. Of course, we are very pleased, actually, with extensions of the wind and solar credits over a fixed time in the——

Senator ALEXANDER. I am saying if we got rid of them, we could use it for clean energy research. We have to set priorities somewhere.

Secretary MONIZ. The continuing incentive we think is very important. It is the combination of technology and deployment that right now is helping drive costs down quite dramatically.

Senator ALEXANDER. I do not think it is a very complicated equation. I think instead of tax credit for mature technologies to subsidize wind developers, most of that money goes to rich people who take tax deductions, and to subsidize oil and gas production, we could give tax credit for the R&D that you want and that would be one way to find the money.

NUCLEAR WASTE

May I ask you some questions about nuclear waste storage and whether there is a role for private storage options? Is it likely that the department will receive an application from a private entity that may be seeking a license, or that the Nuclear Regulatory Commission will be receiving an application from a private entity that would store used nuclear fuel?

Secretary MONIZ. First, the answer is yes, we certainly do see a role for private storage. My understanding is the NRC may be receiving an application this year.

Senator ALEXANDER. What are the benefits of private storage in terms of technical feasibility, schedule, cost, and management flexibility?

Secretary MONIZ. Well, the devil is in the details, but we think that private storage could have advantages in accelerated schedule potential, more flexibility, and also getting a confirmed cost up early. So I think there could be many advantages.

Senator ALEXANDER. Last year, Senator Feinstein and I included in the Senate energy and water appropriations bills language to clarify the department's authority to pursue private storage options. Do you support that language?

Secretary MONIZ. Yes, I do.

Senator ALEXANDER. Thank you. My own view is that we should proceed on all tracks at once toward a solution, to finding a place to put used nuclear fuel.

Number one in my book would be Yucca Mountain, although that is certainly not unanimous in the Senate, and we have a stalemate there. But we have said many times that even if we filled up Yucca Mountain, we would still need other storage sites. Is that not true?

Secretary MONIZ. Yes, it is. We have a request for information out across-the-board for storage and repository solutions.

Senator ALEXANDER. So Senator Feinstein and I, both on the authorizing committee and in the Appropriations Committee, supported measures to create new repositories. So Yucca Mountain, the new repositories that we have talked about, and then a third option would be the private storage opportunities we talked about.

As I understand it, they could be large enough to be a significant opportunity, these private commercial storage sites, to receive a large part of the used nuclear fuel that is today stranded at reactor sites that have been closed.

Secretary MONIZ. Yes, I agree with that.

Senator ALEXANDER. Thank you.

Senator Feinstein.

ENERGY SUBSIDIES

Senator FEINSTEIN. I was just saying, Mr. Chairman, to the staff that I think we ought to take a real look at those subsidies that have existed for more than 20 years. It seems to me that the new energy architecture ought to be able to prove itself in terms of its market acceptance within a 20-year period and not be continued beyond that. So I would agree with you on that point.

NUCLEAR WASTE STORAGE

I would like to ask some questions about the Texas privately owned and operated storage facility. The NRC told us that this facility could get a license and start operating with no additional action from Congress.

Do you agree with that, Secretary Moniz?

Secretary MONIZ. I certainly would take the NRC judgment at face value for the NRC. At DOE, our general counsel does believe we have authority to move forward with that.

My understanding is the private entities would sure like some of the clarity that Congress could bring to it, for example, the language you introduced last year.

Senator FEINSTEIN. I do not recall the language right now, but I think my point, and I think the chairman's point has been, if you can do it, why not go ahead and do it?

Secretary MONIZ. Well, again, I think getting clarity from congressional action, would I think help a lot with the private entities. But eventually, there will be issues that need to be clarified, such as how will liability be addressed, what are issues in terms of when does ownership convert to Federal hands, et cetera? So I think that is something we can work with.

Senator FEINSTEIN. Can you put that together and submit it, if you need to submit it? I do not think you need to submit it to the Congress. You could submit it I guess to the White House for approval. But I do not understand why this does not go ahead.

Every time we have some hope for a new nuclear waste facility, something stops it.

Secretary MONIZ. Well, we are in discussion. We have had discussions in the past with the Texas group, for example. As I said, we are very supportive of that going forward. The first step is getting to the NRC.

Senator FEINSTEIN. I guess I am beginning to feel inordinate frustration because the chairman, I, the chairman of the Energy Committee, three chairs, and the ranking of the Energy Committee, we put together a bill for a nuclear waste policy and it sits and sits and sits.

Yet we are supposed to go ahead and now go into the area of small, modular nuclear reactors, that also produce waste but no place for the waste. I think it just puts more and more people in jeopardy of one day an accident.

So I have said this probably two dozen times, if there is going to be a future, a real future for nuclear, there has to be a place to put the waste.

Now that we have one, and we know that you are cleared to go ahead and sanction it and work out the legal anomalies or difficulties, my thinking is that you should do just that.

Secretary MONIZ. Well, we are, in fact, evaluating and working on all the options going forward. As you know, I fully support the waste bill that you and your colleagues worked on. I think it is right on. And we need to move forward on the storage option, whether it is public or private, especially so that we can move the fuel from shutdown reactors quickly.

We will work on that with you, obviously.

Senator FEINSTEIN. Not work with us. Will you move ahead and if the Texas operator has a good proposal that meets your concerns, will you move ahead with it?

Secretary MONIZ. Yes, if they are licensed by the NRC, we are completely prepared to work with them and move ahead, yes.

Senator FEINSTEIN. Again, the NRC told us that the facility could get a license and start operating with no additional action from the Congress.

Secretary MONIZ. But they have not filed for a license. We expect that to come later in this year. Until that happens, were a little bit limited, but we are certainly discussing this at length and getting prepared.

Senator FEINSTEIN. Thank you.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Feinstein.

Senator Graham.

MIXED OXIDE FUEL FABRICATION FACILITY

Senator GRAHAM. From one program to the next. Now let us talk about MOX.

Mr. Chairman, I think you have been kind enough to listen to my request to have a more in-depth study of this. Five minutes I do not think is going to do it justice. This is a monumental decision for the country and certainly South Carolina.

Mr. Secretary, last year, you had $345 million for construction of the MOX program, is that correct, in your budget?

Secretary MONIZ. Yes, sir.

Senator GRAHAM. This year, it was zero. Is that correct?

Secretary MONIZ. Yes, we proposed I think $275 million for starting termination.

Senator GRAHAM. To terminate the program. I just want the committee to look at this. This is a facility in South Carolina. You are welcome to come visit. We will be glad to host you.

In 2013, this is what it looked like. It was 56 percent complete, the actual MOX facility. In 2016, this is what it looks like today. It is a pretty mammoth place, 70 percent complete. The contractor says $3 billion gets us to where we need to be. We have spent $5 billion to date, and that is what we have for the $5 billion.

Now, the bottom line is, in 2010, we signed an agreement with the Russians to take the 34 metric tons of excess plutonium and put it through the MOX system, so it cannot be used for weapons in the future. Is that correct?

Secretary MONIZ. That is correct. If I may, I would just say, as you know, we do not agree with the numbers. And secondly, this is only one plant in the whole——

Senator GRAHAM. Right, there are two others. But you do agree that place is real?

Secretary MONIZ. Oh, I have been there.

Senator GRAHAM. We have paid $5 billion.

Secretary MONIZ. It is big.

Senator GRAHAM. It would be a hell of a basketball court.

Secretary MONIZ. It is big.

Senator GRAHAM. I do not know what we will do with it.

But the bottom line, now, in 2010 was the new approach you are talking about studied as an alternative to MOX? What is the new approach, very quickly?

Secretary MONIZ. The new approach is actually the old approach of dilution and disposal, as we have done for roughly 5 tons.

Senator GRAHAM. Was the old approach studied in 2010?

Secretary MONIZ. I do not believe so. I was not here at the time, but I do not believe it was looked at carefully. I think also in 2010——

Senator GRAHAM. So how can it all of a sudden be the best alternative when no one looked at it in 2010?

Secretary MONIZ. I think one of the issues is that in 2010, I think, first of all, the cost escalation was not fully appreciated. And frankly, the contractors have badly underestimated costs.

Senator GRAHAM. In 2016, the NDAA act said that you needed to rebaseline this project. Have you done that yet?

Secretary MONIZ. That is ongoing. The Army Corps of Engineers is doing that.

Senator GRAHAM. So in 2010, this new technology we are talking about today actually existed. Did anybody look at it and say this is better than MOX?

Secretary MONIZ. Again, I am speculating. In 2010, the issue was MOX was the program of record with the Russians. But again, the costs subsequently were recognized as being much higher.

Senator GRAHAM. So is the situation for MOX, we just missed it really badly on MOX, in terms of actual cost?

Secretary MONIZ. I think, yes. The cost, as you know, multiplied dramatically.

Senator GRAHAM. So how much did we miss it by? A thousand percent?

Secretary MONIZ. No, probably a factor of three, something like that.

Senator GRAHAM. So we missed it by a factor of three.

Secretary MONIZ. Probably.

Senator GRAHAM. Has anyone been fired?

Secretary MONIZ. Again, we should talk——

Senator GRAHAM. If you run a private business, and somebody created a project and you are $5 billion into it, and you find out it actually costs three times more than everybody thought, would you fire somebody?

Secretary MONIZ. Well, I did not say three times, by the way, from today, I meant from the original cost estimate.

Senator GRAHAM. Okay. Would you fire somebody?

Secretary MONIZ. Look, the contractor has had severe reassignments of——

Senator GRAHAM. I just want the committee to know the contractor would be willing to do a fixed-price contract.

Secretary MONIZ. Well, you and I discussed that with them at some point. And as we know, they came back in an unresponsive fashion.

Senator GRAHAM. Well, I disagree with you. But how much did the new technology cost?

Secretary MONIZ. We estimate probably around $15 billion lifetime costs.

Senator GRAHAM. How much time have you spent studying that?

Secretary MONIZ. Well, again, this is an old technology with essentially no technology risk.

Senator GRAHAM. The pathway forward for this new technology, do you have to get an agreement with the Russians before you can implement the new technology?

Secretary MONIZ. Yes, we have a well-defined, exercised, successfully——

Senator GRAHAM. How far along are you with the Russians?

Secretary MONIZ. We have had informal discussions, which have been positive. But frankly, until I think we have a signal in terms of which way we are going——

Senator GRAHAM. So we are going to change course and hope the Russians agree later?

Secretary MONIZ. Well, we are in a situation where the MOX——

Senator GRAHAM. Is that what you are saying?

Secretary MONIZ. The MOX approach has extreme uncertainties, the biggest one of all is finding $1 billion a year.

Senator GRAHAM. Well, it is not uncertain, it is just too expensive, you believe. It will work, won't it?

Secretary MONIZ. Presumably. There is a higher——

Senator GRAHAM. It works in France——

Secretary MONIZ. We assume it will work, of course.

Senator GRAHAM. [continuing]. Doesn't it?

Secretary MONIZ. It turns out that argument was used by the contractors mistakenly.

Senator GRAHAM. It doesn't work in France?

Secretary MONIZ. It works in France in a very different process under a very different regulatory regime, not using weapons plutonium, which brings in additional complications.

Senator GRAHAM. My time is up, but it seems to me that we started a project that apparently nobody knows if it even works. Somebody should be fired for that.

Secretary MONIZ. We expect it will work.

Senator GRAHAM. Well, okay. You are going to take this diluted material and put it where?

Secretary MONIZ. Well, we know that 13 tons certainly without permit or land withdrawal modifications, could be in WIPP (Waste Isolation Pilot Plant). And the first six tons from South Carolina——

Senator GRAHAM. Okay, where is WIPP?

Secretary MONIZ. That is in New Mexico.

Senator GRAHAM. Have you talked to Senator Udall about this?

Secretary MONIZ. We have had informal discussions, yes.

[Laughter.]

Secretary MONIZ. As with the Russians.

The first six tons, as I say, have long——

Senator GRAHAM. Informally, you may get about 20-something tons of plutonium blended down, so I want you to know that formally.

The stuff at Texas, where does it go?

Secretary MONIZ. I'm sorry?

Senator GRAHAM. Does it all go through this blended process, all 34 tons?

Secretary MONIZ. Well, the proposal would be that all 34 tons——

Senator GRAHAM. Does the $15 billion include all 34 tons?

Secretary MONIZ. Oh, yes. Yes, it did.

Senator GRAHAM. It did? Are you sure about that?

Secretary MONIZ. Well, I will check just to make absolutely sure. But——

Senator GRAHAM. I think you might want to check.

Secretary MONIZ. All right.

Senator GRAHAM. Finally, what legal changes would be necessary to change course? Would any changes in the law be required?

Secretary MONIZ. Changes of law? Well I am not the lawyer.

Senator GRAHAM. Have you talk to the lawyer?

Secretary MONIZ. What we know is the first——

Senator GRAHAM. Have you talked to the lawyer about what will happen——

Secretary MONIZ. The first 13 tons, as I say, no requirements——

Senator GRAHAM. There are 34 tons. I am not worried about 13. What about the entire 34 tons?

Secretary MONIZ. That is uncertain in terms of what would be required.

Senator GRAHAM. Thank you.

Senator ALEXANDER. Thank you, Senator Graham.

I am going to interject here. Senator Graham and I and the Secretary and Senator Feinstein all talked about this. This is a major decision that Congress has to deal with and that the administration needs to deal with. It does require more than a 5-minute opportunity to ask questions, even in a second round, so we need to schedule additional time, Senator Feinstein and Senator Graham and other members of the committee who may be interested, to deal with this responsibly.

We are talking about huge amounts of money here. You are suggesting it may be $1 billion a year, or a half billion dollars a year. We have spent a lot of time on it, so we need to spend more and take our stewardship very seriously. I have committed to Senator Graham that we will do that.

Secretary MONIZ. As always, I am happy, of course, to have that discussion.

Senator ALEXANDER. Thank you very much, Senator Graham.

Senator Coons.

NATIONAL LABORATORIES

Senator COONS. Thank you, Chairman Alexander and Ranking Member Feinstein. I appreciate your strong and bipartisan leadership of the subcommittee, and our chance to work together.

Secretary Moniz, thank you for your service, for your testimony, and for your very capable leadership of the department. I am going to touch on a series of issues that are across two priority areas and then ask you to respond with the remaining time.

First, on clean energy issues, thanks for your willingness to come to Delaware May 13 for our lab summit. As you know, I visited a number of the national labs, and I hope you will discover Delaware to be an open and supportive place that I hope will enter into some public-private collaborations that will benefit from the strength and reach of our labs.

Secretary MONIZ. The home of the first catalysis center at a university.

Senator COONS. Correct. I am thrilled, as always, with what you know about Delaware.

The independent review of national labs was released last December and had 36 general recommendations. I am interested in your views on whether Congress has an appropriate role and what it would be in terms of authorizing and appropriating some of those next steps.

CLEAN ENERGY

Second, just in terms of the midterm clean energy issues, you have placed a great priority on clean energy innovation. Many of us have supported the doubling of research investment called for

by the initial COMPETES Act. ARPA–E has made great strides. I was pleased to again be invited to speak at their summit.

In addition to ARPA–E, DOE has the energy hubs EFRCs and NNMIs, and there are now regional clean energy partnerships. I hope you will speak to them and how, as building blocks of the whole innovation pipeline, they fit into your overall plan.

And I hope you will talk about how we sustain something like the Mission Innovation commitment, a commitment to doubling investment in the clean energy transition.

JOINT COMPREHENSIVE PLAN OF ACTION

Additionally, in visiting the IAEA headquarters back in January, I was told that as the world's nuclear watchdog, they need a reliable, long-term source of funding to implement the JCPOA and to accomplish their broader nonproliferation goals. A recent GAO report said that IAEA faces potential budget and human resources challenges in order to take advantage of the searching, inspection, opportunities that the JCPOA opened.

How is the department helping the IAEA overcome these challenges? How are the national labs assisting in the recruiting, hiring, and training, which I understand to be a long and expensive process?

Ali Akbar Salehi, head of the Atomic Energy Organization of Iran, just announced that they will be using some of their sanctions relief to train their next generation of nuclear scientists. Is this something about which you think we ought to be concerned? And do you see that as an appropriate use of their funds?

Those are all my questions, and I welcome you using the rest of my time to answer them, as possible.

Secretary MONIZ. Okay, well, thank you, Senator Coons. I will have to be brief on each of them.

CRENEL REPORT ON NATIONAL LABORATORIES

First, on the CRENEL report, the congressionally charged report on the laboratories, first of all, I think charging that panel is indicative of the interest certainly in this group. I want to emphasize that the panel, first of all, endorsed strongly the idea that this laboratory system is very important.

Secondly, they also honed in on something that I completely agree with that, frankly, for a long time—bluntly, I would say from the end of the Cold War—there has been an increasing kind of transactional approach rather than a strategic approach to laboratory management. I think there is plenty of credit to go around.

As the committee acknowledged, we have made some real progress in terms of restoring this more strategic work with laboratories. I could describe examples. But we have a way to go, and we are still looking at it.

We have sent the report to Congress. We accept and will follow through on almost every recommendation. There are a couple that present some problems, but we stay in touch with the cochairs, and I think this has been a very, very good process. I can get more specific if you like off-line.

MISSION INNOVATION

In terms of Mission Innovation, you have kind of actually said at all, that there are certainly new thrusts, but I do want to emphasize an important strengthening of some of the very successful programs that have been working with universities and labs and industries.

ARPA–E

You mentioned ARPA–E, so there is a good example where, with approximately 200 projects now finished, 36 companies have emerged. The fact that in their open call last year a successful program was able to support only between 2 percent to 3 percent of the projects kind of suggests we are leaving an awful lot of innovation on the table.

CLEAN ENERGY

As we go into this world, putting aside one's view of specifics of the Paris agreement, the fact is every country in the world is committed to pursuing a clean energy future. That market, which has been booming, is going to boom even more. We should be there, keeping our innovation advantage in moving forward.

Senator ALEXANDER. Thank you, Senator Coons. We need to keep moving.

Secretary MONIZ. Okay, I can come to Iran later on.

Senator ALEXANDER. Senator Lankford.

LIQUEFIED NATURAL GAS EXPORTS

Senator LANKFORD. Thank you, Mr. Chairman.

And thanks for being here as well. I have a couple things just on multiple subjects here, so I will kind of rapidly run through some of these.

The Department of Energy is currently taking the applications for LNG (Liquefied Natural Gas) exports to non-FTA countries. That has been a process that is ongoing. Is there a set timeline at this point about how long it takes to go through an application process at DOE, those LNG exports?

Secretary MONIZ. No, there is no set timeline. However, I would——

Senator LANKFORD. What is a typical length of time to get an application done right now?

Secretary MONIZ. Recent experience has been weeks to a month, following FERC (Federal Energy Regulatory Commission) approval of the EIS.

Senator LANKFORD. Okay, so FERC first and then DOE, correct? So that has been a quick process. It has not been an issue?

Secretary MONIZ. I do not think so, no. Right now, we have no applications to actually work on, having come through FERC.

Senator LANKFORD. Okay, you have done the study of the 12 to 20 Bcf (Billion Cubic Feet) per day of exports. That is out for comment at this point. Tell me what you think the process is at this point with that study now that it is out, now that it has comments?

Secretary MONIZ. Well, actually, the comment period has now ended, so we are now going through the comments. Then we pre-

pare a response and then issue the report, either in its current or modified form.

Senator LANKFORD. Right. That is what I was trying to pick up, the timeline for that. When do you think that final report will be out there? Or modified report?

Secretary MONIZ. We have no fixed time, but I will guess that we are talking within a month or two.

Senator LANKFORD. Okay. Great. The findings at that point that I saw were marginally positive impact on the macroeconomics, no big issues, same as what it was with the earlier study as well. That was about 3 years ago.

GRANTS

Okay, let me walk through some of the grant issues. We are talking about a lot of increases in grant dollars. One of the questions that I always have is, how do we track that? Once you release a grant dollar out, for effectiveness, for use, how it is going, the diversity of the different groups that get it. So let me just ask a couple questions on it.

When you start to track through this, how do you evaluate the performance of the grant money? Do you have a set formula for that? Do you have a set of criteria that we are releasing these grant dollars for this particular project, and this is the end goal? Or is it more open than that? Basically, I am asking, how do we help look back on the money and say, the money was spent, was that spent wisely?

Secretary MONIZ. It actually varies by program. I will give just maybe two examples.

For example, we just mentioned ARPA–E. That is a case where the program managers are very active and engaged with the projects all along, monitoring success, guaranteeing early rather than late failure, if that is where it is going. Whereas in the Office of Science, if it is a university grant, it is more that the universities execute and produce their published papers and reports.

Senator LANKFORD. So what I want to be able to evaluate is, before the money goes out the door, we have a set of evaluation metrics that we know about this grant, whether it is going to a university or somewhere else. Are you confident at this point every one of these grant opportunities go out there with a way to measure success on these?

I understand this is research, so not everything turns out positive. I get that. That is why you do research. I am trying to figure out how we evaluate the metrics of this at the end. Do you feel confident that every one of these grant opportunities, regardless of how it goes out the door, has evaluation metrics?

Secretary MONIZ. Well, again, if we are not using metric in an overly formal sense, because it is done differently in each program, then I would say the answer is yes.

Senator LANKFORD. Okay, that will be one of the things I want to be able to track on it. How do you track, at this point, research that would be done by the public sector and research that would be done only by us? What we are trying to determine often is, what is the research that will not be done unless we do it cooperatively as a Nation, that would be beneficial to the Nation long-term, rath-

er than dipping into research that some corporation would have done, but they would be glad for the American taxpayer to pay for it instead? But if we pay for, great, they would love to have the research done, but we do not need to do that research, they would do it. Does that make sense?

Secretary MONIZ. Sure. I mean, that is part of the judgment of the research managers have to use. Although I would slightly modify it and say that sometimes the judgment is not just that it would not be done otherwise, but that we may feel that there is a major public benefit to an acceleration of it. Then we might do some cost-sharing to incentivize earlier work by the private sector.

Senator LANKFORD. Okay, so then at that point, we are helping the private sector do their research or we take it away from them, and we would take it on? If you are seeing something that is ongoing that the public sector is already doing and we can accelerate it?

Secretary MONIZ. Or they are not doing it yet, but we would like them to get into it and accelerate. That is where we are assigning the public benefit, in those cases. But again, in other cases, obviously, most cases, it is about something that would not otherwise be done.

In particular, the biggest criterion is capturing especially precompetitive work that one individual entity would not otherwise capture the benefits of and, therefore, would be reluctant to invest in it.

AGENCY-TO-AGENCY RESEARCH

Senator LANKFORD. Right. And the final issue, and I do not want you to have to answer this, because I am out of time on it, is the agency-to-agency. This is one of the areas I want us to provide more oversight as a committee to be able to ask just the basic questions. Could it be done? Is it being done by another agency? Could it be done by an outside agency, if the taxpayer doesn't do it, freeing up dollars for us to be able to do other things? And finally, good evaluation tools, so at the backside of it, we can evaluate how it was used.

To me, that is a philosophical oversight issue that we can take on as a committee, and I would look to be able to partner with you on the things that you have already learned that we can continue to use in the years ahead.

Secretary MONIZ. Okay.

Senator LANKFORD. Thank you.

Senator ALEXANDER. Thank you, Senator Lankford.

Senator Murray.

HANFORD SITE

Senator MURRAY. Thank you, Mr. Chairman.

Secretary Moniz, let me start with the Hanford site in central Washington. Year after year, I have found the President's budget to be shortsighted and inadequate when it comes to Hanford. This is really troubling because, as you well know, the Federal Government has a legal and a moral obligation to clean up Hanford and the other nuclear waste sites across the Nation.

Now I do appreciate your focus on the tank farms and waste treatment plant and implementing direct, low-feed waste to begin processing waste as early as 2022. But I find it unacceptable that the President's budget essentially robs Richland operations to pay for the Office of River Protection's waste treatment mission. It is really critical that we finish the job on all fronts.

I have a hard time seeing how that will get done when the administration has once again cut RL (Richland Operations Office) by $190 million. That is nearly double the amount that was cut last year.

With those kinds of significant cuts, how is the administration going to meet its legally binding commitments to the Tri-Cities community?

Secretary MONIZ. Well, certainly, as you say, Senator Murray, first of all, within a limited total budget, we are trying to make sure we address the priorities, including those areas that I think have the highest risk, which especially is liquid waste at a variety of sites.

Now coming to Richland, first of all, and I think you would agree, that we have made very substantial progress in the last year, certainly along the river corridor, for example. And the fiscal year 2017 budget will have major progress, complete the demolition of the plutonium finishing plant, move sludge from the K area away from the river, pumping the plateau, a lot of progress on the landfill.

Senator MURRAY. I appreciate that. But several of the high-risk projects that are close to the Columbia River and the City of Richland, specifically the 324 building and the 618–10 burial grounds, they are underfunded in the President's budget, despite this subcommittee's clear support for completing them.

So I want to ask you for your commitment that these critical projects will be funded, and if you could give me a detailed plan on how you are going to do that.

Secretary MONIZ. Sure, we certainly will do so. But I would emphasize that building 324, we are doing the procurements we need and will in fiscal year 2017, for the novel robotics technologies that we are going to need. So we can't just go in and move the dirt out until we develop the robotics.

But we hear you, and we will respond to that.

Senator MURRAY. Okay, well, we made a decision to focus cleanup on the reactors in the 300 area that is closest to the Columbia River and City of Richland. We have made great strides. But I really fear that this budget overall really foreshadows a decision by DOE to claim victory at RL and walk away from all the other cleanup RL is responsible for on the central plateau. RL still has a long list of cleanup on the central plateau, about 1,000 waste sites. We have 500 facilities, contaminated groundwater, all pose risk to the public, to the environment, and to the work force.

Every year that those are not addressed, DOE spends millions of dollars on surveillance and maintenance.

So it is really critical that we know we have a commitment to that and not set it aside as we try to get all the critical work done on that. So I just wanted to make that point to you today.

Secretary MONIZ. Yes. We are trying to prioritize the risks. But let's work together on that. We will come back with a plan.

COLUMBIA RIVER TREATY

Senator MURRAY. Okay. And finally, I want to ask you about the Columbia River Treaty. In December 2013, the administration was presented a regional consensus to modernize the Columbia River Treaty. It was a multiyear process involving our Northwest tribes and all of our stakeholders, and the entire Northwest delegation urged the administration to begin formal negotiations with Canada. But not a lot of progress has been made.

My constituents are really concerned about the impacts the change in administration will have on these negotiations, and I wanted to urge you today to push the administration to begin these formal negotiations with Canada, and I really hope that you will proactively raise the Columbia River Treaty when Prime Minister Trudeau visits the United States this week.

Secretary MONIZ. If I may say, Senator Murray, because we agree with you, and, as you know, Bonneville is our lead negotiator in that, that I met with Secretary Kerry last week, and we both agreed about the importance of pushing this along. There is a negotiator and we certainly would like to——

Senator MURRAY. We have had a negotiator for a while. We need this to get started, because we cannot afford to wait, once the new administration, whoever it is, to reeducate everybody, have new people appointed, and get it started. It needs to get started now.

Secretary MONIZ. Agreed.

Senator MURRAY. Thank you.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Murray.

Senator Hoeven.

Senator HOEVEN. Thank you, Mr. Chairman.

It is good to see you, Mr. Secretary. I saw you not too long ago, I think at our Energy Committee.

Secretary MONIZ. Sorry.

Senator HOEVEN. I say, I think we saw each other at our Energy Committee not too long ago.

Secretary MONIZ. Yes, we did.

Senator HOEVEN. So it is nice to have you back.

Secretary MONIZ. Thank you.

Senator HOEVEN. It is good to see you again.

CARBON CAPTURE AND SEQUESTRATION

I know this will surprise you immensely, but I am going to follow up on something we talked about there.

We have companies in North Dakota, as you know, having been to North Dakota are capturing CO_2 and sequestering it. You are at the Dakota Gasification Company where they are capturing. It is a coal-fired electric plant. Actually in their case, they convert coal to synthetic natural gas. But then they capture the CO_2, and we pipe it off to the oil fields and use it for tertiary oil recovery.

We have other companies with power plants, coal-fired electric power plants, now they produce electricity, not synthetic methane. But they are trying to develop and implement post-combustion car-

bon capture retrofits to existing plans greater than 350 megawatt equivalent.

Since you are a nuclear physicist, I know you understand that perfectly.

They are, in fact, working with a very outstanding organization, which I know you are also well aware of, and I think our chairman may be as well, the Oak Ridge National Laboratory located in the State of Tennessee.

So my simple question to you is, in your budget, you have $170 million proposed for large-scale, carbon capture sequestration demonstration projects. I am wondering if this would be the kind of thing that you would seek to participate in funding and developing in concert with some of our companies that are trying to lead the way forward with this post-combustion carbon capture technology, actually implementing it, and working with such outstanding organizations as the Oak Ridge National Laboratory.

Secretary MONIZ. I would like to associate myself with your quality statement about the Oak Ridge National Laboratory.

First, yes, first of all, we are continuing some large-scale capturing demonstrations. But as you have said, in the fiscal year 2017 budget, we want to emphasize getting into smallish pilot projects of more novel technologies, chemical looping, oxy-combustion, et cetera. I think what you are talking about sounds like——

Senator HOEVEN. This is oxy-combustion.

Secretary MONIZ. Yes, I believe, again, I do not know all the details, but I believe it involves oxy-combustion and supercritical CO_2, which we are also supporting in the fiscal year 2017 budget.

So again, I think what we need is to have perhaps a group come in and provide a briefing on exactly what the cycle is. If it is a novel cycle, then that will be a question of going through a proposal process with our group.

But we think this is a good time to really start pushing our next generation capture cycles.

Senator HOEVEN. But am I right, this is the kind of project that you are looking at using that funding for?

Secretary MONIZ. I do not know enough about it. From what I have heard——

Senator HOEVEN. You are not going to commit right here and now.

Secretary MONIZ. No, I am not. But it looks encouraging.

Senator HOEVEN. Good.

Secretary MONIZ. If it combines oxy and CO_2 supercritical, that is already an interesting cycle.

Senator HOEVEN. And the State of North Dakota is already working with these projects through our energy council, wherein the State participates through funding and other support as well as the University of North Dakota through the Energy and Environmental Research Center, which I think you have also visited.

Secretary MONIZ. I visited, and we support.

Senator HOEVEN. Okay, thank you.

Senator ALEXANDER. Thank you, Senator Hoeven.

Senator Udall.

Senator UDALL. Thank you, Chairman Alexander.

Good to see you again, Secretary Moniz. You are working hard on so many different issues, and many of them impact New Mexico, as you know.

CONTRACT TRANSITIONS AT THE NATIONAL LABORATORIES

We have two national security labs, Sandia and Los Alamos, that are doing very important national security work on preserving the stockpile and the capabilities.

As you know, these major programs include the life extension projects. There is an issue I want to raise there, because you have pending contract negotiations for both Sandia and Los Alamos. I am concerned about losing sight of the ball during these transitions.

Can we have your commitment you will work to ensure the transitions at the labs are as seamless as possible, and that we do not lose focus of the important national security work during this period?

Secretary MONIZ. Yes. And I can assure you that we are already thinking hard about that issue of the transitions.

Senator UDALL. Good. Thank you.

Secretary MONIZ. Of all the labs, actually, especially those in New Mexico.

Senator UDALL. Especially those, and I believe the one in California that the ranking member, Senator Feinstein, also——

Secretary MONIZ. I meant because of the contracts.

Senator UDALL. Yes, the contracts on those.

OFFICE OF TECHNOLOGY TRANSITIONS

Now you and I have visited, and you had a visit to New Mexico, on technology transfer. We were very grateful to have Jetta Wong, the director of DOE's Office of Technology Transitions, out to New Mexico last fall to meet with some of the laboratory personnel at Sandia and Los Alamos.

Expanding technology transfer I think is critical to maximize the economic impact of taxpayer dollars at the labs, so that innovations can move from the lab to the marketplace.

I support a permanent line item for the Office of Technology Transitions and its critical missions.

My question is, does $8.4 million in your request provide the resources needed to administer the technology commercialization fund and coordinate tech transfer initiatives across all 17 national labs? And does the OTT (Office of Technology Transitions) have the flexibility it needs to effectively match funds with private partners?

Secretary MONIZ. Well, first, we do think the $8.5 million, roughly, is sufficient for the office to do that. Of course, that is working with the technology transitions offices in the various laboratories.

There is one issue of flexibility where I am concerned. It is not about the matching funds per se, but the question about whether the technology commercialization fund must be spent exactly proportionally to each office's contribution versus allowing some more flexibility. Otherwise, it is very small, individual pots.

But that is one area where I would say it may be challenging.

Senator UDALL. If there is any help we can give on that, please let us know.

Secretary MONIZ. Great.

MISSION INNOVATION

Senator UDALL. I am also very interested in this Mission Innovation that I think you and I have spoken about, a new initiative to double funding in DOE's clean energy research portfolio over the next 5 years.

Could you tell us a little bit about that and how you see that moving forward to meet the energy challenges of the future?

Secretary MONIZ. Again, I think this is really about the highest priority right now in terms of moving forward in the energy space. It will both enhance critical programs that we already have. We have mentioned ARPA–E several times, but there are others, the Energy Frontier Research Centers at both laboratories and universities, the bioenergy centers, a whole set of them, the hubs, which are principally at the laboratories.

They will be within that new area. For example, we propose a significant expansion, actually a tripling of the Energy-Water Nexus Crosscut. That would include a new hub focused on desalinization, energy efficient desalinization, very important. We also have a large grid program, actually, the labs put together a grid program. And last year we committed over $200 million to lab-led programs on the grid.

But in addition, there will be some new thrusts, one of which I mentioned in my opening statement is we proposed $110 million to go toward new regional energy partnerships with the idea that that can stimulate innovation ecosystems across our entire country.

WASTE ISOLATION PILOT PROJECT

Senator UDALL. Great. I just wanted to double-check with you on the opening of WIPP. I understand that you have it on track to reopen.

Secretary MONIZ. We believe that we are on still on track for late this year, to begin placing TRU waste.

Senator UDALL. And one of the important things there is making sure that it reopens safely——

Secretary MONIZ. Absolutely.

Senator UDALL. [continuing]. In terms of the employees and everyone. As you know, that has been my main concern with WIPP.

But thank you very much for the job you are doing.

Mr. Chairman, I yield back.

Senator ALEXANDER. Thank you, Senator Udall.

Senator Shaheen.

Senator SHAHEEN. Thank you, Mr. Chairman. And thank you, Mr. Secretary, for being here this afternoon.

SITING AND PERMITTING ENERGY PROJECTS

The agency's 2015 quadrennial energy review calls for more public participation in the siting and permitting process for energy projects. We have two projects in New Hampshire that there is a great deal of concern about in the communities that they are going through. One is in the northern part of State called Northern Pass, which is a project bringing down waterpower from Hydro-Quebec.

The other is a gas pipeline that is going through the southwestern part of the State.

I just wonder if you can talk about the importance of public engagement in siting and permitting these kinds of energy projects, because I think it is fair to say that the people who are going to be affected by those projects feel like, while there have been public hearings and there is a process in place, many people do not feel like that process is really taking into account what their concerns are and has responded adequately to that.

So can you talk about that and also talk about whether there is more that FERC can do to address public concerns because they have, from the public perspective, a very opaque process for how they operate and what their decisions depend on.

Secretary MONIZ. I can certainly speak more about the DOE's approach. I certainly agree with the importance of input, including being sometimes patient, in terms of going through the process.

NORTHERN PASS

To take Northern Pass, I think the process has already resulted in changes in the proposal. I think it was 50 miles, roughly, more now going underground, which was a positive. That was filed. We have reopened public comment.

Frankly, I think there are four meetings this week in New Hampshire, public meetings on that. And frankly, we appreciated working with you and the delegation in terms of how the scheduling and locations would be optimally set.

So we will be getting the feedback from this week's meetings on Northern Pass.

With regard to FERC, I really cannot say too much in terms of how they might modify processes. I think you would have to ask Norman Bay.

ENERGY EFFICIENCY

Senator SHAHEEN. We have tried that.

I want to switch to energy efficiency, because I was pleased to see that the budget request includes strong funding for energy efficiency programs and EERE (Energy Efficiency and Renewable Energy).

As I know you are aware, because you are from New England, we have faced very high energy costs for decades in the Northeast. For many businesses, next to the cost of personnel and product costs, it is often the next highest cost of doing business in New England.

Secretary MONIZ. And a competitive question, therefore.

Senator SHAHEEN. Yes. One of the things that for many of those small businesses that has been very helpful has been their ability to be more energy efficient and to access assistance with that energy efficiency.

So can you talk about initiatives within EERE that will help small businesses as they are trying to facilitate the deployment of energy efficiency technologies?

Secretary MONIZ. Certainly, again, I really appreciate your strong focus on efficiency because, again, I have said it before, but I would like to repeat it, I have never seen a credible solution to

meeting our long-term goals without major demand-side contribution.

Senator SHAHEEN. Right.

Secretary MONIZ. So it is critical.

So we are working across-the-board. We are working with buildings, in particular commercial buildings. Things like the Better Buildings Challenge are critical. That has been tremendously successful. And it is really just using our convening power as opposed to budget. So this kind of branding and a critical requirement to share best practices, that is having a huge impact.

Of course, on weatherization for homes, we do propose a several percent increase in the budget. Another different direction—okay, I will mention first the R&D.

On the R&D, we propose a substantial increase in terms of the technology development for building efficiency. That has multiple aspects.

In terms of standards, I would note that we just put out a notice of proposed rulemaking on general service lamps. By the way, I also just did something for the NHL, who has made a huge move toward LEDs and other energy efficiency activities.

Senator SHAHEEN. By NHL you mean National Hockey League?

Secretary MONIZ. National Hockey League.

Senator SHAHEEN. I just want to clarify that. Right.

Secretary MONIZ. Believe it or not, the National Hockey League and NASCAR are two organizations that are really pushing hard on clean energy. We are working with them. With NHL, it is LEDs, refrigeration, and other kinds of issues.

But also I would note that in just the last year, this is quite relevant to small businesses and commercial enterprises, we put out a consensus standard done with the stakeholders as opposed to a more formal DOE rulemaking on commercial furnaces, the rooftop kind of boxes. That is a very big deal. It is the biggest efficiency rule that we put out, and it was done on a consensus basis representing the different relevant sectors.

So it is really across the board, from R&D to standards to convening and getting best practices shared.

Senator SHAHEEN. Thank you. I assume you would agree with me that it would be very good for us to pass the energy bill that is currently on the floor the Senate?

Secretary MONIZ. Maybe even a further strengthened one.

Senator SHAHEEN. Thank you.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Shaheen.

URANIUM ENRICHMENT DECONTAMINATION AND DECOMMISSIONING FUND

Mr. Secretary, Senator Feinstein asked you about the $674 million that the President's budget allocates from the USEC Fund, in fact, for cleaning up uranium enrichment sites in Tennessee, Kentucky, and Ohio. That $674 million is not now authorized for that purpose, is that correct?

Secretary MONIZ. Well, my understanding is that those are existing funds that have been put there—as I said, in 2000——

Senator ALEXANDER. No, I don't think that is correct. I think they are authorized for USEC. They are not authorized to clean up uranium enrichment sites.

Secretary MONIZ. I will correct this for the record, if it is incorrect, but I believe in 2000, there was specifically a designation of part of that fund for cleanup, for D&D.

Senator ALEXANDER. Staff says it is a small portion that never got used.

Secretary MONIZ. It was a small portion, but as a reminder, all of that fund bears interest, and it is now a very substantial amount.

Senator ALEXANDER. It is a substantial fund. But the bottom line I think, if we cannot use that fund, there are zero dollars in your budget for cleaning up uranium enrichment sites in Tennessee, Kentucky, and Ohio. Isn't that correct?

Secretary MONIZ. We certainly need to continue that work. And again, we proposed a way of going back to the initial concept, that the users pay with a very, very small fee.

Senator ALEXANDER. I think the answer is there is zero, unless we can use the USEC money, right?

Secretary MONIZ. Our proposal is to use the USEC Fund.

Senator ALEXANDER. Right. But I am not convinced that we have the authority to use it. So why have you not asked Congress to reauthorize the money so that we can use it for the purpose you intend?

Secretary MONIZ. Well, I think our budget proposal to the Congress——

Senator ALEXANDER. But it would require new legislation, would it not? I mean, wouldn't the Energy Committee have to reauthorize the use of the money for the purpose you now intend?

Secretary MONIZ. First of all, we have, of course, discussed this with the Energy Committee last week.

Senator ALEXANDER. But you have not sent them any legislation.

Secretary MONIZ. Again, I do not want to get onto shaky ground with that, in terms of what is needed. My impression is that certainly Congress could go forward with that fund, but it would require——

Senator ALEXANDER. With all respect for you, and you know I have a lot for you, I think you are already on shaky ground here.

Secretary MONIZ. I mean, we certainly can be forthcoming with a proposal for legislation.

Senator ALEXANDER. I think basically the administration has done something that other administrations have done for things they think Congress will find other money for. The Army Corps of Engineers is the second example. They know Congress cares about that because people care about it, so they underfund it, knowing that we will have to make up the money, which we did last year.

And you know that we have to clean up the uranium enrichment sites in those three States, so basically you put zero in the budget for it, knowing we are going to have to use discretionary money, and that means reduce other funding.

So I would ask that if you want us to use that, that you consider sending promptly up to the Congress a request for the authority to do it——

Secretary MONIZ. Okay.

Senator ALEXANDER. [continuing]. If it is needed. Let me go back——

Secretary MONIZ. We will follow up on that, Mr. Chairman.

CARBON USE AND REUSE

Senator ALEXANDER. [continuing]. To something we discussed privately before. I am not a scientist and I do not pretend to be, but my common sense is pretty good.

We are in a swivet in this country and the world over climate change and the need to produce carbon-free electricity. And we figured out a way in our power plants to get rid of sulfur, nitrogen, and mercury, and a number of other elements.

As a result, the air in Tennessee around the Smoky Mountains is a lot cleaner. You can actually see the Smokies. People like that.

We have not really figured out as well a commercially viable way to capture carbon and do something with it if it comes out of a power plant, out of a coal-fired power plant or out of a gas-fired power plant.

There is a limited mechanism we have for capture and sequestration, which could be available some places. But even if it is available, it is very expensive. And the process of carbon capture for any purpose is expensive.

Would it not be a huge priority for this clean energy research to see if we can reduce the cost of carbon capture and find some commercially viable use for what we capture? Wouldn't that permit us to use unlimited amounts of coal and gas, and reduce poverty around the world, and reduce the cost of electricity?

Secretary MONIZ. We totally agree. I think we are doing that. Maybe we could do more, but we are doing that across-the-board.

So first of all, again, the fiscal year 2017 budget specifically has the proposal for doing three novel technologies, obviously, with the hope that they would also be lower cost.

I do want to emphasize, even with conventional capture, the costs have been coming down with more and more use. And also the enhanced oil recovery, when the oil prices were higher, especially, provided a substantial offset against the cost. That is another issue lower oil costs have impacted.

So we are working on the front-end of different capture technologies, not just with different solvents but with different processes like chemical looping.

Then on the backside, one example of a hub is the one that is basically working on sunlight to fuels, which means sunlight plus water plus CO_2 to fuels.

Senator ALEXANDER. Is that the ARPA–E company?

Secretary MONIZ. No, no. This is a hub, combination of Caltech and Berkeley doing that. But I think ARPA–E also has a program for this.

The trick is the product has to be something with enormous use in the economy because of the magnitude of the CO_2.

Senator ALEXANDER. Right, I understand. You can turn it into limestone, but who needs that much limestone, or whatever it is.

My time is up, but it just seems to me that, from a commonsense point of view, that is the holy grail of clean energy research,

because if you can actually figure out how to make a commercially viable use of capturing carbon and then using it, holy smokes.

Secretary MONIZ. Mr. Chairman, I think, to me that is exactly the kind of big thing we would like to do in Mission Innovation.

And by the way, I think I can say that when Bill Gates uses a prime example, that is the one he uses.

Senator ALEXANDER. Senator Feinstein.

WATER DESALINATION

Senator FEINSTEIN. Thanks very much, Mr. Chairman. I have four questions, but the first one is kind of interesting.

I am a big believer in desal. I would like to see it go ahead. There are 27 proposals for the coast of California. I saw where you have a proposal for $45,100,000 for one of these hubs on desal. So I thought, well, is this to develop a third-stage membrane to improve the reverse osmosis process, and I took a look at the budget.

Mr. Secretary, let me tell you what this says: The Energy-Water Nexus Crosscutting Initiative, which draws on ideas—this is under this section—presented in DOE's report "The Water-Energy Nexus Challenges and Opportunities," is an integrated set of cross program initiatives that builds and deploys on a DOE mission critical data modeling and analysis platform to improve understanding and informed decisionmaking.

It goes on like that. I come to the end, I mean, I do not understand a single word in this. And yet, at least my approval has to go on this.

Why does your staff write budgets like this?

Secretary MONIZ. I will have to ask them.

[Laughter.]

Secretary MONIZ. If I could say it in English, $25 million of it will be the desal hub, looking at novel technologies. We will be looking at wastewater utilization, at the issues of how one moves water over large distances, all of which, of course, are quite relevant to California, for example.

Senator FEINSTEIN. Yes, but stop. I understand the big problem is that the energy coefficient is not positive, ergo the need for a better membrane, reverse osmosis membrane. So the needed research is to come up with what is called a third-stage membrane. So I wanted to see if this is it. But nowhere on page 62 is there any specific information as to what would be funded in this desal hub.

So I am sure not going to vote for it until I know what it is going to do, because I know what the need is for the third-stage membrane.

Secretary MONIZ. We will send to you a white paper.

Senator FEINSTEIN. Thank you. Well, that I can understand.

Secretary MONIZ. Right.

NATIONAL IGNITION FACILITY

Senator FEINSTEIN. Let me talk about the National Ignition Facility. It was supposed to have achieved limited controlled fusion burn, also called ignition, in 2012. Now I am told it will be as long as 10 years before ignition will be achieved, if ever.

The question is, what is the present status of the ignition effort? The last time I was there, they were not going for ignition. They were going for other things.

Can you share your view of the likelihood of NIF (National Ignition Facility) ever achieving ignition?

Secretary MONIZ. So I think it is important as a prologue to say that there is a lot of work, critical work, frankly, most of the stockpile stewardship work, without ignition, has made major contributions, especially in exploring extreme pressure regimes for weapons.

And also, the other piece of good news is last year there were a record number of shots, I think 350, if I recall correctly.

But on ignition, that has proved very elusive. They are still looking at different designs of targets to try to get there. I have to be honest. I cannot sit here and in any sense guarantee that it will reach ignition. I can say that it has provided extremely useful and important data for the stockpile stewardship program.

Senator FEINSTEIN. As you know, this is a very expensive program. If it is not going to reach its goal, which I understand it may never be able to produce fusion——

Secretary MONIZ. As I said, I certainly would not guarantee—yes, ignition or fusion.

However, frankly, I think it should have been phrased differently—I do not mean by you; I mean by them—because the real goal, the key goal, was exploring extreme regimes of pressure and temperature of relevance to nuclear weapons, and that has been done.

Senator FEINSTEIN. Well, I was here when Pete Domenici was on the committee and opposed this. We voted for it. And here we are 10 years-plus later, and it is not there.

Now here is another one.

I am sorry, may I take a couple minutes?

Senator ALEXANDER. Sure.

INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR

Senator FEINSTEIN. ITER. If the United States remains a partner, the ITER project would require a yearly appropriation soon of between $250 million and $400 million. It is my understanding that such a funding level would make ITER the single most expensive Office of Science project on a yearly basis. Such a funding requirement would negatively impact our ability to invest in new or upgraded scientific facilities such as the light sources.

Today, in the fiscal year 2017 budget request, fusion energy science is the lowest priority of science programs. It was cut by 9 percent while other programs went up from 3 percent to 7 percent.

So the fiscal year 2016 bill requires you to make a recommendation to Congress by May 6, 2016, on whether the United States should remain a partner in the ITER project or withdraw. What is your current thinking?

Secretary MONIZ. Senator Feinstein, first of all, let me just note that while the total budget went down in fusion, the ITER request is up slightly, I think $10 million, at least provisionally until we make the May report. But a big part—I can say this now that I

am no longer recused. A big part of that is the elimination of the MIT program in that budget.

With regard to ITER, we will have a report in April that will be a key piece of information for the May report. I would say for sure that the management has really significantly I think been upgraded with Mr. Bigot as the director general.

But we have to see in April what the project review information is. Then we will get back to Congress in early May.

Senator FEINSTEIN. Well, this is an international program. I do not know why we need to participate, candidly. If we continue to do so, the costs are huge. I mean, I am really a doubting Thomasina there.

LOAN GUARANTEE PROGRAM

Let me ask you another one, and that is loan guarantee program number two. There is already $4 billion in loan authority tied to uranium enrichment. $2 billion of the enrichment loan authority is tied to the conditional loan guarantee with Areva, a French state-owned company. This conditional loan guarantee was made in 2010. In May, it will be 6 years.

To my staff's knowledge, and therefore, my knowledge, there has been no tangible action related to the Areva conditional loan in years.

The other $2 billion in uranium enrichment loan authority was previously widely viewed as tied to USEC, and USEC has gone through bankruptcy, and the department just closed the project in Ohio.

So question: Why not reclassify the existing $4 billion uranium enrichment loan authority for fossil and renewable energy rather than seek new loan authority?

Secretary MONIZ. Well, we would similarly need the authority of Congress to do that.

Senator FEINSTEIN. Is that your proposal?

Secretary MONIZ. No, our proposal was $4 billion of additional authority, but if one chose instead to try to relabel it—as you said, that is for fossil efficiency and renewables. The nuclear loan program does have considerable amount of remaining authority, but we do not have the authority to transfer that to renewables.

Senator FEINSTEIN. Could the chairman and I and you, could we sit down and discuss this?

Secretary MONIZ. Sure, I would be delighted.

Senator FEINSTEIN. Maybe at the end of the discussion, at least I will know exactly the pros and cons of this.

Secretary MONIZ. Yes. Yes.

Senator FEINSTEIN. Okay. We have yet to receive a proposal from the department as to how much crude oil the SPRO intends to sell in fiscal year 2017, for the purpose of SPRO modernization. When can we expect to see a budget amendment from the department proposing that sale?

Secretary MONIZ. We are working to get that as soon as possible. The report is due in May, and we would like to try to accelerate that. We are working hard at that. I cannot give you a fixed date, but we have every motivation to try to get that to you as soon as we can.

Senator FEINSTEIN. Yes, thank you.

Secretary MONIZ. And we would like to start that program in fiscal year 2017.

Senator FEINSTEIN. Okay.

What do you think the chances are that we could—are we wed to that loan guarantee of Areva? Nothing has happened. It is 6 years, no tangible action.

Secretary MONIZ. I cannot discuss an individual application, however——

Senator FEINSTEIN. It was for USEC.

Secretary MONIZ [continuing]. I would just note that right now the whole uranium enrichment market is, if anything, oversupplied, and I think there is not a strong commercial motivation right now.

Senator FEINSTEIN. Okay, so what you are saying is that we really do not need it, so I assume you will take some action to change that.

Secretary MONIZ. I will consult with the program in terms of what action we take.

Senator FEINSTEIN. Thank you.

Thanks, Mr. Chairman.

Senator ALEXANDER. Do you have any other questions?

Senator FEINSTEIN. No, that is fine.

Senator ALEXANDER. Thanks, Mr. Secretary. It seems to me that Senator Feinstein has raised some issues we need to pursue.

INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR

The ITER decision, it may be a nice thing to participate in, but we have real, pressing budget priorities here that we are going to have a hard time meeting, and we are counting on you with your background to help us make a correct decision on that, not just whether it is something that might be nice, but whether it is more important than the other options that we have to fund.

URANIUM ENRICHMENT DECONTAMINATION AND DECOMMISSIONING FUND

Number two, that $674 million is a problem. You know that. I know that. If you really think you want to use some of that $1.8 billion to help pay for it, then we need to get resolved the authority to do that.

Secretary MONIZ. So we will follow your suggestion about presenting some language.

MIXED OXIDE FUEL FABRICATION FACILITY

Senator ALEXANDER. And three, Senator Feinstein and I both want to continue a deliberate focus on MOX. We have discussed it in-depth before. When we dealt with the uranium facility, we had a red team to take a look at it. It came back with a recommendation. We adopted the recommendation. We have a cap of $6.5 billion and a date of 2025, and we have a path toward getting there, so we have resolved that.

The MOX is a different kind of problem. You have recommended that we switch from one way of dealing with the plutonium to an-

other. Your red team, that separate red team, told us basically that the cost might save us $500 billion a year.

Secretary MONIZ. $500 million.

Senator ALEXANDER. $500 million a year. I have to get my b's and m's right. $500 million a year.

Secretary MONIZ. It may be $600 million or $700 million, actually.

Senator ALEXANDER. So you are saying it could be $500 million to $700 million or $800 million a year for many years that might be the difference in spending.

So we have an obligation to the taxpayer to address that question and to do it promptly. I think you are correct to try to address it in the budget, and we need to take sufficient time to deal with it.

We know that requires a discussion with Russia. We know that we have to have a place to put the plutonium. We also know that there is a place to put the plutonium today, as soon as WIPP opens, which you would expect to be later this year. Is that correct?

Secretary MONIZ. Initial operations.

Senator ALEXANDER. Initial operations. There is a backlog of material to go to WIPP, and the South Carolina plutonium would have to get in line. But my understanding is that all 13 tons of plutonium that are now in South Carolina could go into the WIPP facility once it reopens without changing the law and adding new land. Is that correct?

Secretary MONIZ. Correct.

Senator ALEXANDER. But that still leaves open the question of what to do about the entire 34 tons that we are obligated to deal with and what about an agreement with Russia.

So Senator Graham and others are right to want an answer to that. The taxpayers are going to want to know from us why we are spending $500 million to $800 million a year on something where we could have saved that much money, if that is true, and when we have very pressing other needs, for example, cleaning up uranium enrichment, clean energy investment, the Office of Science investments.

So I will be working with Senator Feinstein and Senator Graham and others who are interested to set up a scheduled discussion to permit us to deal with the MOX issue on a deliberate basis.

Secretary MONIZ. Great. I am certainly happy to work with you on that.

ADDITIONAL COMMITTEE QUESTIONS

Senator ALEXANDER. Well, the hearing record will remain open for 10 days. Members may submit additional information or questions for the record within that time, if they would like. The subcommittee requests all responses to questions for the record to be provided within 30 days of receipt.

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

QUESTIONS SUBMITTED TO DR. ERNEST J. MONIZ

QUESTIONS SUBMITTED BY SENATOR THAD COCHRAN

Question. The fiscal year 2016 Energy and Water Appropriations bill provided $62,100,000 for the Advanced Fuels program to continue implementation of accident tolerant fuels development. It is my understanding that implementing the second phase of DOE's proposed fuel Development plan, which follows the completion of Phase 1 this fall, would require an increase in funding of approximately $15 million. The Department's budget request for fiscal year 2017 reduces funding for the ATF program by $3 million.

Can you please explain to the Committee the why Department has not requested the necessary funds to this program?

Answer. The development of advanced light water reactor fuel with enhanced accident tolerance continues to be a high priority for the Office of Nuclear Energy. The Department is working toward the goal set by Congress after the Fukushima accident to install test fuel rods or an assembly in a commercial power reactor by 2022. The fiscal year 2017 Budget Request for the Fuel Cycle R&D Advanced Fuels subprogram balances work toward this near term goal with research on longer-term Advanced Light Water Reactor (LWR) fuel concepts, long term transmutation fuel concepts, cross cutting infrastructure development, and modeling and simulation support.

Phase 2 of the Accident Tolerant Fuel (ATF) program is planned to begin in fiscal year 2017 and will be a 6-year effort to develop and qualify a small number of the most promising concepts. The number of concepts under investigation in fiscal year 2017 and beyond will drop sharply relative to the number of concepts that underwent preliminary investigations in Phase 1 due to down selecting to the most promising concepts from Phase 1.

Question. Congress has been supportive of the Administration's efforts to promote the use of safe and clean nuclear energy, including Reactor Concepts Research, Development, and Demonstration (RD&D) program. The Committee and the Congress have continued to encourage the Department to support the development and evaluation of nuclear power technologies that are safer, create less waste, less costly, and more proliferation-resistant. It is my understanding that the Department recently awarded two contracts through the Advanced Reactor Concepts program.

Please detail for the members of this Subcommittee the projected cost of delivered power for each of these applications, in addition to the estimated amount and type of waste each applicant's reactor would produce.

Answer. The two awards issued by the Advanced Reactor Technologies (ART) program are at the early conceptual design phase, which limits the quantitative information available to accurately project costs of delivered power and waste generation. At this stage of development, one awardee's concept is indicating the potential for the costs of delivered power to be lower cost than conventional light water reactor technology based on innovative design features and, due to a liquid fuel form, it is expected to have a lower volume of waste than conventional light water reactor technology. The other awardee's concept draws heavily on NE's R&D program and is estimating higher efficiency electricity production that could contribute to a lower cost of power than conventional light water reactor technology, as well as a significant reduction in waste generation through the use of high burn-up fuel.

QUESTIONS SUBMITTED BY SENATOR MITCH MCCONNELL

Question. What are the Department's plans to continue the ongoing and vital environmental cleanup operations at the Paducah site following July 2017, when the current, 3-year deactivation contract is scheduled to end?

Answer. The Department has an active procurement for a follow-on contractor at the Paducah Site that will provide continuity for the environmental cleanup operations and facility deactivation. The draft Request for Proposal has been made available to the industry. We also held an Industry Day from May 17–19, 2016. The Department is actively executing a plan that will allow for a seamless transition to the next contractor.

Question. I have concerns about the lack of commitment for ongoing clean coal research in the President's fiscal year 2017 budget. For example, the President's budget proposes to reprogram $240 million out of the Fossil Energy Research and Development budget, which is currently committed to a clean coal project in its final stages of development. Congress explicitly appropriated funding for clean coal projects, like this one. Do you intend to continue funding this project to bring it to completion in the current fiscal year?

Answer. Following an extensive and careful review, DOE's Office of Fossil Energy (FE) determined that advancing any additional Federal funds would not substantively increase the likelihood of Texas Clean Energy Project (TCEP) or Hydrogen Energy California Project (HECA) success, and that no additional taxpayer funds should be put towards these projects. A recent DOE Office of Inspector General audit report reached a similar conclusion to FE's in regards to not advancing any additional Federal funds to the TCEP project. DOE previously suspended HECA project funding in January 2015 for failing to make sufficient progress—most notably, not securing an approved site for the sequestration of the site's carbon dioxide after more than 6 years of effort. President's proposed fiscal year 2017 budget would use around $211 million from TCEP project funds and around $29 million from HECA project funds to secure the required $240 million for fiscal year 2017 FE R&D budget.

QUESTIONS SUBMITTED BY SENATOR RICHARD C. SHELBY

Question. Domestic manufacturers of residential water heaters in the State of Alabama have recently expressed concern about the lack of a final rule from the Department of Energy (DOE) relating to new efficiency standards. While interim guidance and a subsequent rating became effective on July 13, 2015, the DOE has not yet published the final conversion factor associated with this rule.

It is my understanding that DOE is continuing to work on this matter and that this conversion factor allows manufacturers to correctly rate existing products using the newly-established universal efficiency descriptor, or UEF, without incurring the expense of physically retesting individual and multiple products. Moreover, this new metric also allows consumers to more effectively compare a broad selection of water heating products and their efficiency to ensure the most appropriate fit for their needs. Such a model was outlined by Congress in the American Energy Manufacturing Technical Corrections Act (AEMTCA), on December 18, 2012, which also directed the DOE to promulgate implementing regulations.

Secretary Moniz, does the DOE have a timeframe in which a final rule and conversion factor will be released? Secondly, can I have your assurance that an appropriate period of time, preferably at least 1 year to phase in all existing models, will be incorporated in any final regulation to avoid disruption in the marketplace and compliance under the new UEF?

Answer. The development of a mathematical conversion to a new efficiency metric from a prior metric is a complex task that must be given careful consideration in order to denominate standards and ratings in the new metric that are equivalent to those under the previous metric. This process requires a large amount of product testing and analysis, and an opportunity for stakeholders to provide comments, all of which can be time-intensive activities. The Department published a notice of proposed rulemaking (NOPR) on April 14, 2015 that proposed a mathematical conversion and accompanying standards denominated in the new efficiency metric. 80 FR 20116. The Department also convened a public meeting to discuss its proposed conversions as set forth in the NOPR, a meeting which generated significant stakeholder comment. After the publication of that NOPR, the industry trade association—the Air-conditioning, Heating, and Refrigeration Institute (AHRI)—provided additional test data to DOE to be used in the development of the mathematical conversion factor. During this period, DOE also conducted further testing of its own. Accordingly, DOE undertook a re-analysis to incorporate such additional data and is currently developing a supplemental NOPR that proposes a mathematical conversion factor and accompanying standards based on the expanded dataset. The Department plans to publish the supplemental NOPR in early summer and a final rule later this year.

EPCA contains requirements to ensure that manufacturers' products that currently comply with Federal standards remain compliant after the conversion factor is issued. Specifically, EPCA requires that a covered water heater must be considered to comply with the final rule and with any revised labeling requirements established by the Federal Trade Commission to carry out the final rule if the covered water heater was manufactured prior to the effective date of the final rule and complied with the efficiency standards and labeling requirements in effect prior to the final rule (42 U.S.C. 6295(e)(5)(K)). The Department plans to adopt an approach that would determine compliance consistent with the requirements of EPCA.

QUESTIONS SUBMITTED BY SENATOR LINDSEY GRAHAM

Question. Secretary Moniz—On March 3, 2016, in response to a question by Senator Cassidy about the contractor's commitment to the MOX project you said: "If I—may—if I may say precisely what the discussion was, the definition of fixed cost that came back was fixed cost unless we go over by a lot, and then you [DOE] pay. It's [the] truth." Later, on March 9, 2016, in response to my question during the Senate Appropriations Subcommittee on Energy and Water hearing, you commented on the contractor's commitment to a plan for fixed-cost pricing: "You and I discussed that with them at some point and as we know they came back in an unresponsive fashion."

It is my understanding that the contractor made you an offer on February 20, 2014 to provide fixed cost pricing, in exchange for DOE's taking responsibility for changes to project scope or design that are ordered by DOE. Are you aware of a last-best offer made to DOE by the MOX contractor—in writing—on February 20, 2014? Are you also aware, to quote the offer, that it would "allow [the contractor] to move as much as 100 percent of the scope into the fixed price 'Bucket' in the future? Finally, did DOE ever respond to the contractor's final offer, on February 20, 2014, in writing?

Answer. The Department is aware of the proposal that the MOX contractor sent to the Department in February 2014, but considered it unresponsive as it still contained exclusions and would at best cover only 75 percent of the remaining costs. This risk allocation is particularly important given the nature and extent of the remaining work to finish construction, startup, and operations of the MOX facility leaving approximately $10 billion subject to cost reimbursement, with no cost cap and potentially several billion in cost overruns as MOX Services has demonstrated on the work they are currently performing. In short this proposal did not meaningfully reduce risk to the Department since it moved additional scope into the fixed price category only after achieving milestones or triggers, many of which would not occur until the end of the project. We verbally communicated our rejection of it during discussions with the MOX contractor.

Question. Secretary Moniz—On March 1, 2016, during the House Appropriations Subcommittee on Energy and Water hearing, you stated that an analysis conducted by High Bridge Associates on the potential criticality problems at WIPP that may arise from packing 47 metric tons of plutonium at the facility, along with the transuranic waste that would go to WIPP, was evaluated by the Sandia National Laboratory. Can you provide me, along with the appropriate congressional committees, with a copy of the Sandia National Laboratory's analysis?

Answer. Yes, this analysis will be made available. A copy is provided for the record.

Question. Secretary Moniz—On February, 23, 2016 and March 1, 2016, respectively, you and NNSA Administrator Klotz hinted at the potential need for a secondary repository, other than WIPP, to accommodate the total 47 metric tons of plutonium. At the Senate Armed Services Subcommittee on Strategic Forces hearing on February 23, 2016, Administrator Klotz responded with the following statement regarding my question about where DOE would send the diluted Savannah River and MOX-bound Plutonium: "We would send it to either WIPP or a repository like WIPP." Similarly, on March 1, 2016, during the House Appropriations Subcommittee on Energy and Water hearing, you stated: "We're not saying that necessarily all of that [Savannah River and otherwise MOX-bound plutonium] goes to New Mexico." Given these statements, has the Administration identified potential states and sites for another repository? Where are these sites located? What work has been done to determine the viability to use alternate disposal sites?

Answer. In response to the Joint Explanatory Statement accompanying S. 1356, the National Defense Authorization Act for fiscal year 2016, the Department prepared a report that provides additional information relevant to these questions. The Department submitted the report to the Senate Armed Services Committee in May 2016.

Question. Secretary Moniz—In all of your recent testimony to Congress regarding the Plutonium Management and Disposition Agreement of 2000 (PMDA), you have referred to "informal discussions" with both the Russian government and with ROSATOM, the Russian-owned nuclear power company and government agency responsible for implementing the PMDA. It is acknowledged that, in order to uphold the PMDA, the abandonment of MOX and a move towards the "Dilute and Dispose" alternative would require prior approval by the Russians. However, there is much debate over whether the Russians would (1) be willing to come to the negotiating table and (2) want something in return. If Russia does not agree to move forward

with the Dilute and Dispose option, will the United States still proceed with this alternative disposal method?

Answer. The PMDA (paragraph 1 of Article III) clearly provides a path for the Parties to agree on methods of disposition that do not entail irradiation as fuel in reactors ("any other methods that may be agreed by the Parties in writing"). We expect that Russia will work with us as we pursue a different method to achieve what is a mutually beneficial goal, just as the U.S. supported Russia's reassessment of its plutonium disposition strategy a few years ago.

The U.S. Government has had an ongoing dialogue with Russian officials regarding the multiple analyses of plutonium disposition alternatives. The U.S. Government has requested formal consultations with Russia regarding the dilute and dispose method under the provisions of the PMDA. It is premature to discuss concerns with this approach before formal consultations begin.

Question. Secretary Moniz, while I disagree with your plan for cancelling the MOX project, I know you share my feeling that the Savannah River Site is a national asset in many areas, including national security and innovate technology. Please give me your vision for the future of the site over the next 5 years, and the next 10 years?

Answer. In support of the DOE Strategic Plan, the Savannah River Site (SRS) is in the process of developing a joint Office of Environmental Management (EM)/National Nuclear Security Administration (NNSA) site-wide Strategic Plan addressing focus areas of Nuclear Security, Environmental Stewardship and Science and Energy. Completion of the SRS Strategic Plan is expected by the end of calendar year 2016. The focus areas of the plan include high level waste cleanup (including commissioning and startup of the Salt Waste Processing Facility); management and disposition of nuclear materials; continued optimization of the Savannah River National Laboratory in support of EM technology needs; and national security (e.g., tritium requirements).

QUESTIONS SUBMITTED BY SENATOR JAMES LANKFORD

Question. The Department of Energy closed the public comment period for the study on exporting 12–20 bcf/day of LNG in February; this study found a "marginally positive" impact of higher LNG export volumes. When will the Department finish responding to public comments on the study?

Answer. The 2014 EIA LNG Export Study and DOE-commissioned 2015 LNG Export Study (together, "Studies") examined the effects of LNG exports from 12 to 20 billion cubic feet of natural gas per day (Bcf/day). The Studies and all comments were entered into the legal proceedings of all pending non-free trade agreement (FTA) LNG export applications. The Department will summarize issues raised in the public comments on the Studies and respond to these issues in the next final non-FTA LNG export order that would cause cumulative approved non-FTA LNG exports to exceed 12 Bcf/d.

Question. The latest DOE approval brought total authorized exports to 11.80 bcf/day, making it likely that the next application before the Department will breach the 12 bcf/day volume. When will DOE be able to act on applications that would bring the total above 12 bcf/day?

Answer. The Department has established a pattern of issuing final decisions on applications to export LNG to non-FTA countries promptly after FERC has issued an order denying rehearing requests on projects in which an environmental review was required and in which DOE was a cooperating agency. In these cases, DOE had begun work on the public interest review of these export applications while the environmental review of the project at FERC was ongoing. Accordingly, DOE has begun conducting public interest reviews of applications linked to proceedings at FERC that are currently pending a FERC final order on rehearing. These include applications by Lake Charles Exports, LLC and Jordan Cove Energy Project, L.P. In keeping with past practice, DOE expects to issue a final order promptly after FERC issues a final order on rehearing for either the Lake Charles or Jordan Cove liquefaction projects. If DOE authorizes the export volumes requested in one of these two applications, the total volume of approved, long-term LNG export authorizations to non-FTA countries would exceed 12 Bcf/d.

Question. DOE provides significant funding in the form of grants, particularly out of the Energy Efficiency and Renewable Energy account. This year DOE is asking for a 104 percent increase in spending in this area, bringing the EERE budget to $4.233 billion for fiscal year 2017. Congress and the Department have proper controls in place to ensure that the goals of these programs are being met and funds are not being used on projects that do not have a Federal interest.

What controls does DOE have in place to ensure that this money is spent on research that would not be done at universities or by the private sector without Federal involvement and investment?

Answer. Applied research areas are defined in both the DOE and EERE strategic plans, as well as the multi-year plans maintained by EERE technology program offices. EERE regularly hosts workshops and publishes Requests for Information to help further define and regularly update these plans. All DOE funding for university and private sector execution are competitively awarded through Funding Opportunity Announcements (FOAs). Elements of the process used for these awards include:

—Deputy Assistant Secretaries approve requirements for FOAs. Their formal approval review assesses every project relative to five core questions:
  —Impact—Is this a high-impact problem? If successfully developed it should make material contributions toward national energy goals.
  —Additionality—Will EERE funding make a large difference relative to existing funding from other sources, including the private sector?
  —Openness—Are we focusing on the broad problem we are trying to solve and open to new ideas, approaches, and performers?
  —Enduring Economic Impact—How will EERE funding result in enduring economic impact for the United States?
  —Proper Role of Government—Why is this investment a necessary, proper, and unique role of government rather than something best left to the private sector to address?
—Independent experts score proposals during the pre-award merit review process prior to selection and award.
—Statements of Project Objectives establish milestones and success metrics for each project. Progress and expenditures are managed through EERE's Active Project Management program.
—A peer review process provides objective progress reviews throughout a project's lifecycle and can inform program decisions going forward. EERE engages experts, including experts from industry and from other Federal agencies, to review our project portfolios for effectiveness, currency and impact.

Question. Does the Department have guidelines and metrics to evaluate the performance of grants once they are awarded? What are these metrics?

Answer. Yes, the Department has put in place the following processes to establish metrics and then evaluate the performance of financial assistance awards: Statements of Project Objectives establish performance milestones throughout the execution phase of projects. Those milestones serve as the project metrics for performance monitoring and management. Progress and expenditures are managed through EERE's Active Project Management program. Project managers assess performance against milestones, as well as cost and schedule, quarterly.

—Project managers are required to perform quarterly, written projects assessments, an annual site visit for applicable projects and at least two face-to-face meetings with performers each year.
—Invoice approval policy requires project manager confirmation of reasonableness and activity completion and separate contracting officer verification of cost allowability. Contracting officers perform final invoice approval.

Annual peer reviews provide objective performance reviews by experts not directly involved in the project's management. EERE engages experts, including those from industry and from other Federal agencies, to review our project portfolios for effectiveness, currency and impact.

Question. Does the Department have robust cross-agency coordination to ensure that another agency is not undertaking the same research, such as NSF, EPA, etc.?

Answer. Yes, EERE has very robust cross-agency coordination through a number of activities including Memorandums of Understanding (MOU), joint merit reviews and other activities performed as part of long-range program planning and annual project activities.

EERE engages with experts during development of our Multi-Year Program Plans and technology roadmaps to ensure we are only addressing the most pressing issues that require public investment. EERE engages industry and government experts prior to publication of Funding Opportunity Announcements through workshops, RFIs and pre-funding merit reviews. EERE does broad outreach to ensure that we access the most diverse set of experts.

EERE has also partnered with the Department of Interior on an MOU for hydropower, with the Department of Commerce for manufacturing, with the Department of Agriculture on biomass research, and with the Federal Highway Administration for the Smart City Challenge, as well as many other collaborative relationships

across government and industry. Specific examples of inter-agency collaboration include:

EERE launched the Manufacturing Innovation through Energy and Commerce (MITEC) pilot in four states—Georgia, Michigan, Ohio, and Virginia. The program will provide small businesses access to the advanced tools, technology transfer expertise, and research capabilities of the Department of Energy's (DOE) national laboratories and to the technical assistance and business development resources of the Department of Commerce's Hollings Manufacturing Extension Partnership (MEP), which is a program within the National Institute of Standards and Technology (NIST). This new interagency partnership strives to broaden the commercial impact of the DOE's national labs and equip American entrepreneurs and businesses with the resources and support they need to develop new products, commercialize clean energy technologies and expand into global markets.

—EERE and DOE partnered with the Department of Transportation (DOT) through an MOU on Smart Transportation Systems and Alternative Fuel Technologies to accelerate research, development, demonstration and deployment of innovative smart transportation systems and alternative fuel technologies.

—EERE collaborated with the U.S. Environmental Protection Agency (EPA) and SAE International to launch Green Racing, which uses motorsport competition to develop and test cleaner fuels and more efficient vehicle technologies that manufacturers can transfer to consumer vehicles.

—EERE's battery program collaborates extensively with the Interagency Advanced Power Group, EPA, NASA, the National Science Foundation, DOT and DoD.

Question. Nuclear energy could become more critical in our nation's energy mix should regulations like the EPA's 111b and 111d be upheld by the courts. Yet, only a handful of new reactors have been licensed by the Nuclear Regulatory Commission since 1979. What is causing the lack of new, approved nuclear energy projects?

Answer. There are several factors that have contributed to the lack of new nuclear project starts in the U.S. over the past few decades. One issue is that relative to other types of generation, nuclear plants have high capital costs (but they tend to have low O&M and fuel costs). The upfront costs of nuclear are high in part because the cost of commodities (such as steel and concrete) has increased, as has labor, and large, specialized nuclear components (such as steam generators and reactor coolant pumps). In addition, electricity prices in many regions are low, driven largely by low natural gas prices. U.S. utility decisions to add or replace electric generation capacity are based on these economics, and with the capital cost of building a natural gas plant significantly less than that of a similarly sized nuclear plant and with no projected rise in gas prices in the near future, nuclear power in some cases does not appear to be competitive to the domestic utility decision makers. This picture, however, can vary substantially by region: the competitiveness of nuclear depends on local factors including fuel and power prices, market structures, and policies.

Question. Each new reactor is estimated to cost between $5 billion to $7 billion. What is behind this considerable construction cost? What steps could be taken to lower this cost and bring more nuclear energy online?

Answer. Nuclear new build projects have become very expensive largely due to strict construction standards, increasing nuclear safety regulations, and high labor costs here in the U.S. and abroad. Safety features necessary for the current generation of reactors, such as massive containment domes and multiply redundant cooling and backup systems, make up a significant portion of such costs. The Department has taken steps to address the high cost of nuclear builds by supporting new designs that: (1) are more passively safe than designs in the existing fleet and require fewer redundant safety systems; (2) are constructed with modular components that are manufactured in factory environments and assembled at the construction site; and (3) are standardized (contrasted with the one-off designs of the past that have unique components and requirements) and are expected to result in consistency in construction, operation and regulation. The Department supported the development of two domestic Generation III+ large light water reactor (LWR) designs under the Nuclear Power 2010 program, and, as a result, four Westinghouse AP1000 reactors are currently being built in the Southeastern U.S. The Department is currently supporting the development of standardized, passively safe small modular reactors (SMRs), which could address many of the cost issues currently impacting the industry. SMRs are about a third or less of the size of the large LWRs; all components can be fabricated in a factory environment, which is expected to improve quality and reduce construction costs; and are sized to replace many of the aging fossil power generation plants that will be retired over the next decade. The Department expects the first SMR project to be constructed in the 2025 timeframe and is currently con-

sidering program options to continue to accelerate the commercialization of SMRs in the U.S.

QUESTIONS SUBMITTED BY SENATOR PATTY MURRAY

Question. Secretary Moniz, I remain concerned with the pattern I am seeing within the budget requests for Richland Operations (RL) at Hanford. The Administration made a decision to focus cleanup on the reactor areas and the 300 Area closest to the Columbia River and City of Richland, and you have made great strides with this cleanup under the 2015 Vision. However, I fear the fiscal year 2017 budget request, as well as last year's budget request, is leaving key projects in the 2015 Vision unfinished. Specifically, the 324 Building and the 618–10 burial ground projects have not been funded by the Administration 2 years in a row. While I recognize that we are operating in times of constrained budgets, I ask that you provide me a detailed explanation of DOE's rationale for advancing other work within RL's responsibilities instead of completing the 2015 Vision.

Answer. Richland's budget request supports continued cleanup progress at the Hanford Site, including the River Corridor. The Richland budget request is designed to maintain safe base operations; maintain surplus nuclear facilities; continue groundwater remediation; continue Plutonium Finishing Plant demolition, capping and demobilization; enable progress on River Corridor cleanup activities; and support K West Basin sludge removal progress in alignment with Tri-Party Agreement milestones. At this level, Richland will also fund limited work scope associated with infrastructure upgrades and site-wide essential services for Richland and the Office of River Protection.

Further, the fiscal year 2016 Energy and Water Development and Related Agencies Appropriations Act directed the Department to provide to Congress a report on its 5-year plan for the River Corridor Closure Project that explains any deviations from previously made agreements. This report is currently in development, and is anticipated to be submitted to Congress later this year.

Question. Similarly, I am concerned that with the 2015 Vision nearing completion, DOE will in turn slow cleanup work at RL and delay the projects RL is responsible for on the Central Plateau. Even with completion of work along the Columbia River, RL has much work to do on the Central Plateau, including remediation and demolition of 1,000 waste sites, 500 facilities, and contaminated groundwater. Many of these are highly contaminated with radioactive and chemical waste, posing a risk to the public, environment, and workforce.

Secretary Moniz, I strongly encourage DOE to develop and begin executing the next Vision for RL to address the critical Central Plateau cleanup work. Furthermore, I ask that you provide an outline of the Central Plateau cleanup plans covering at least the next 5 years and the funding needs to advance this work.

Answer. As directed by Congress in the fiscal year 2016 Energy and Water Development and Related Agencies Appropriations Act the Department is currently working on a report that will provide a 5-year plan for the River Corridor Closure Project that explains any deviations from previously made agreements. This report is anticipated to be submitted to Congress later this year. The Department is prepared to address additional questions regarding future cleanup activities, including Hanford's central plateau work scope, through a detailed briefing to you or members of your staff.

Question. Secretary Moniz, I appreciate the commitment DOE has shown to protecting the Hanford workforce and addressing the risks associated with chemical vapors in the tank farms. We owe the men and women who work at Hanford the highest safety standards.

In February 2015, DOE released an implementation plan for the "Hanford Tank Vapor Assessment Report" (Report) which is split into two phases to address the 47 recommendations within the Report. It is my understanding that $61 million was provided in fiscal years 2015 and 2016 funding and that the fiscal year 2017 budget request includes $33 million to support the implementation plan.

Secretary Moniz, I commend the actions DOE has already taken. However, I understand the workforce remains on supplied-air respirators and to date no new personal protective equipment has been deployed for use by the workforce. Can you please provide status report on the implementation plan and what progress DOE has made to date? Has Phase 1 been completed? And when does DOE expect to begin Phase 2? Finally, I ask that you continue to make funding the implementation plan a priority as you develop the fiscal year 2018 budget request.

Answer. In February 2015, a Vapors Implementation Plan was issued by Washington River Protection Solutions LLC to address the vapor issues in the Hanford

tank farms. DOE's Office of River Protection expects Phase 1 of the plan to be completed by the end of fiscal year 2016. Presently, the Office of River Protection and, Washington River Protection Solutions, are testing application of an integrated suite of advanced monitoring and detection technology and software to the Hanford tank farm area. These technologies include infrared cameras, portable area sensors equipped with multiple chemical sensors, in-stack and area vapor detection equipment and portable meteorological stations. Because these technologies need to be tailored to the hazards encountered in the tank farm area, bench scale testing has been completed and a pilot scale test will be conducted in the A and AP Tank Farms this summer. Full scale deployment with the appropriate adaptation will occur after the pilot.

Bench scale testing can be described as testing conducted under laboratory conditions, using simulated vapors, while pilot scale testing will be integrated testing conducted at the A and AP tank farms to determine the effectiveness in the natural environment. While some of these technologies have been used in other industries, they are used in configurations that may be different from those anticipated to be needed in the tank farm environment; hence, testing is necessary to confirm their effectiveness for this application.

Question. The Texas Clean Energy Project (TCEP), funded under the Clean Coal Power Initiative (CCPI), is a first-of-a-kind commercial power plant that will employ innovative technology to capture 90 percent of the plant's carbon emissions. I understand that several contracts and agreements, including a key engineering, procurement, and construction contract, have been finalized by TCEP since December 2015 and that TCEP could reach financial close this year. To achieve this, Summit Power Group of Seattle, Washington, the developer of TCEP, recently requested $11 million in obligated funding under CCPI program. This previously awarded CCPI funding would be matched with at least $4 million in private cost-share contributions. This request has been denied by the Department.

Secretary Moniz, while I recognize it has taken longer than planned for TCEP, like many projects in the CCPI program, to reach financial close and begin construction, I respectfully request that you reconsider this decision given TCEP's recent progress. Further, I ask that you provide a full explanation on the Department's initial decision to withhold funding this project.

Answer. Following an extensive and careful review, DOE's Office of Fossil Energy (FE) determined that advancing any additional Federal funds would not substantively increase the likelihood of Texas Clean Energy Project (TCEP) success, and that no additional taxpayer funds should be put towards the TCEP project. A recent DOE Office of Inspector General audit report reached a similar conclusion to FE's in regards to not advancing any additional Federal funds to the TCEP project. DOE recently extended the no-cost TCEP cooperative agreement through July 1, 2016, so project developers have additional time to secure alternative sources of financing.

Question. Switching gears to the Bonneville Power Administration (BPA). Throughout my career I have worked to ensure BPA maintains the flexibility it needs to provide reliable, low-cost power in the Pacific Northwest.

Congress explicitly gave BPA its own Federal authorities to carry out administrative and operational functions in a business-like manner consistent with sound business practices and Federal guidelines.

Secretary Moniz, I appreciate your work to date in respecting BPA's authority to set policies that support the Pacific Northwest and its ratepayers. However, as we move to the end of this Administration and a time of transition, I ask for your assurances that DOE will continue to recognize BPA's unique authorities.

Answer. The Department appreciates the unique role that BPA plays as a Federal electric utility working in a commercial energy market. The Department also recognizes that BPA carries out its commercial business primarily pursuant to Federal statutes specifically applicable to BPA. The Department recognizes that the Federal authorities in these statutes cover many administrative and operational functions, to be carried out using sound business principles.

The Department will continue to respect the Federal laws specifically applicable to BPA, and will assure that any necessary Secretarial delegations of authority or Department directives to the BPA Administrator remain consistent with these Federal authorities.

QUESTIONS SUBMITTED BY SENATOR JEANNE SHAHEEN

Question. I think that you will agree that the country is currently witnessing significant transformations in our electricity production. In New England, for example,

we are seeing a steady shift to natural-gas fired generation and more and more generation from renewable and demand resources. These changes have brought with it a large number of proposed projects to build and expand the region's upon current natural gas pipeline and electricity transmission infrastructure.

We have two projects in particular that require Federal siting: Northern Pass, a proposed electric transmission line, which requires a Presidential Permit from DOE since the line would cross the international border into Quebec; and the Kinder Morgan Northeast Energy Direct gas pipeline project that currently has an application pending with the Federal Energy Regulatory Commission (FERC).

Through the application process for both projects, I have regularly heard from many of my constituents in New Hampshire who are frustrated about the lack of information from DOE and FERC about the review process, and their belief that public input play only a minimal role in the review and approval process for energy infrastructure projects.

That's why I read with interest the recommendations in your agency's 2015 Quadrennial Energy Review (QER) that echoed the concerns of Granite Staters and called for more public participation in the siting and permitting process. Specifically, the QER recommends that the agency deploy initiatives that:

—prioritizes meaningful public engagement through coordination with state and local governments; and

—establishes regional and state partnerships to better engage impacted communities.

Can you discuss the importance of public engagement in the siting and permitting process for energy infrastructure projects, and what actions has DOE implemented, or will implement in the future, to meet the QER recommendations?

Answer. Public engagement is essential for the credibility of the siting and permitting process for energy infrastructure projects. The first installment of the Quadrennial Energy Review (QER), which focused on energy transmission, storage, and distribution infrastructure, identified early and robust stakeholder engagement as a recognized best practice that can reduce delays and improve projects. The QER found that Federal agencies, by conducting public outreach and engaging with diverse sets of stakeholders, can avoid, minimize, and mitigate issues that might delay a siting or permitting decision.

The Department is actively engaged in the implementation of recommendations from the QER related to the siting and permitting of energy infrastructure, which include:

—Prioritizing meaningful public engagement through consultation with Indian Tribes, coordination with state and local governments, and facilitation of non-Federal partnerships; and

—Establishing regional and state partnerships and co-locating dedicated cross-disciplinary energy infrastructure teams.

As a member of the Administration's Interagency Rapid Response Team for Transmission (RRTT), DOE works with eight interagency partners to improve the overall quality and timeliness of electric transmission infrastructure permitting, review, and consultation by the Federal Government on both Federal and non-Federal lands. The Administration created the RRTT in 2013, and following the QER's release, the RRTT has continued to apply a uniform approach to consultations with Tribal governments and to use Integrated Federal Planning to coordinate statutory permitting and review among Federal and state agencies. DOE also maintains an online dashboard listing the required permits; agency points of contact; milestones and due dates; and descriptions of progress for seven RRTT pilot projects.

RRTT initially focused on the selected pilot projects because, when constructed, they will help increase electric reliability, integrate new renewable energy into the grid, and save consumers money. The pilot projects are geographically diverse and cross through 12 states: Arizona, Colorado, Idaho, Minnesota, New Mexico, Nevada, Wyoming, Utah, New Jersey, Pennsylvania, Oregon, and Wisconsin. They were carefully selected from lists produced through American Recovery and Reinvestment Act-funded, independent, broad stakeholder processes led by the Western Electricity Coordinating Council in the Western Interconnection, and by the Eastern Interconnection States' Planning Council for the Eastern Interconnection.

The Department's Office of Electricity Delivery and Energy Reliability (OE), working in collaboration with interagency partners pursuant to Executive Order 13604 and the June 2013 Transmission Presidential Memorandum, sought public input on a draft Integrated Interagency Pre-Application (IIP) Process. The proposed IIP Process is intended to improve interagency and intergovernmental coordination focused on ensuring that project proponents develop and submit accurate and complete information early in the project planning process to facilitate efficient and timely environmental reviews and agency decisions. In February 2016, DOE published a Notice

of Proposed Rulemaking in the Federal Register (81 FR 5383) to amend its regulations for the timely coordination of Federal Authorizations for proposed interstate electric transmission facilities pursuant to Section 216(h) of the Federal Power Act. The proposed amendments are intended to improve the pre-application procedures and result in more efficient processing of applications. While the proposed IIP rule does not apply to electric transmission projects crossing the Nation's international borders with Canada and Mexico, DOE has and will continue to encourage potential applicants to engage in pre-application coordination activities with DOE, other agencies, and stakeholders.

DOE is also pursuing future actions to meet the QER's recommendations. The Fixing America's Surface Transportation (FAST) Act (Public Law 114–94) implemented many of the QER's siting and permitting recommendations. Among other things, Title XLI of the law establishes a Federal Permitting Improvement Steering Council, of which DOE is a member, to oversee the timely processing of permits and reviews. The law also enables agencies to recover reasonable costs for such activities and standardizes processes for resolving disputes. Additionally—and consistent with guidance issued in a September 2015 Memorandum for Heads of Federal Departments and Agencies (M–15–20)[1] from the Office of Management and Budget and the Council for Environmental Quality—the law requires expanded use of an online dashboard to track major infrastructure projects under Federal review. Use of the Dashboard will improve agencies' communication with project sponsors, enhance interagency coordination, and increase the transparency and accountability of the permitting process.

Sec. 41002 of the FAST Act also requires the interagency governance structure to issue annual best practice recommendations that (1) enhance early stakeholder engagement provided in public comments; (2) increase transparency; (3) reduce information collection requirements and other administrative burdens; (4) improve coordination between Federal and non-Federal governmental entities, including through the development of common data standards and terminology across agencies; and (5) create and distribute training materials useful to Federal, state, Tribal, and local permitting officials.

Many of the provisions included in the FAST Act align with the QER as well as ongoing Administration activities. The Department will continue its work to implement the various provisions and guidance to improve public engagement during Federal permitting and review processes.

Question. As a follow-up to the previous question, are there any priority actions Congress should be considering that would assist DOE in encouraging robust public participation in these permitting and siting processes?

Answer. The QER underscored the value of robust public participation and found that the local nature of permitting decisions requires close stakeholder interaction and appropriate knowledge of local resource concerns to be addressed in the permitting process. Collaboration between Federal agencies and state, Tribal, and local governments that share permitting and review responsibilities for infrastructure projects is essential to moving a project quickly and efficiently.

DOE continues to work with the Administration to build a robust infrastructure that safeguards communities and the environment while also strengthening the economy and creating new jobs. The Administration's ongoing efforts, as well as the permitting provisions contained in the FAST Act (Public Law 114–94), underscore the shared commitment of the Administration and Congress to improve the Federal permit review process for major infrastructure projects. As part of this process, DOE is committed to identifying ways to improve public participation and looks forward to continuing this work with Congress.

Question. Last year, at the 21st United Nations Climate Change Conference, President Obama and several world leaders launched "Mission Innovation", a landmark commitment to reduce greenhouse gas emissions by investing in public-private global clean energy innovation. The President's commitment to "Mission Innovation" and to new funding for a wide range of research, development, and deployment activities is significant and impressive.

How will "Mission Innovation" and other cross-cutting U.S. programs be implemented to maximize the public's investment, and what effect will Mission Innovation have on U.S. leadership in energy efficiency and clean energy?

Answer. Mission Innovation is a government-wide effort and will be coordinated and executed as such to help maximize investment and effectiveness. Within DOE

[1] Office of Management and Budget. "Memorandum for Heads of Federal Departments and Agencies: Guidance Establishing Metrics for the Permitting and Environmental Review of Infrastructure Projects." September 22, 2015 (M–15–20). https://www.whitehouse.gov/sites/default/files/omb/memoranda/2015/m-15-20.pdf.

specifically, Mission Innovation will build on the Department's track record of success in developing and implementing clean energy research, development and demonstration (RD&D) programs. With its world-leading national laboratories and through its current role as the international secretariat for Mission Innovation collaboration, the Department has a strong foundation on which to build its portfolio to help address domestic and global opportunities and challenges.

Over the next two decades, the global clean energy market will come to be measured in trillions of dollars, and the U.S. has the tools, the talent and the industry to lead this revolution. However, other nations are making substantial progress as well, spurred by the combined motivations of addressing climate imperatives and winning market share in the emerging clean energy economy. Supporting a government-wide 5-year doubling path for clean energy RD&D funding is critical to ensure the Nation's continued leadership in clean energy technology development and to keep the U.S. on the cutting edge of potential breakthrough technology research.

Question. President Obama has articulated a goal of doubling U.S. energy productivity. The Department of Energy, under your leadership, is working to implement policies that will put the U.S. on track to meet this goal.

What is the current status of U.S. efforts to meet this goal, and are there any priority actions Congress should be considering that would push the U.S. further along its path to meet this goal?

Answer. In response to the President's goal, the Department partnered with the Council on Competitiveness and the Alliance to Save Energy (the Partners) to launch the Accelerate Energy Productivity 2030 Initiative in the fall of 2014. Since the launch, the effort has further built awareness and engagement around the President's goal by showcasing business and policy strategies within the private sector and all levels of government that are driving improvements in energy productivity across economic sectors. The Partners led five events and a webinar series, collected 11 "Success Stories," and have received endorsements for the goal from over one hundred and thirty organizations to date. The Partners also released a strategic Roadmap (http://www.energy2030.org/roadmap) outlining a set of pathways and identifying specific actions that a broad range of stakeholders can take to help us achieve the national goal of doubling energy productivity by 2030. Moving forward, the initiative will focus on operationalizing strategies included in the Roadmap, connecting stakeholders with technical assistance resources, and hosting an executive roundtable. These efforts will further help identify emerging strategies and ultimately inform sound policy that will bolster energy productivity in the United States.

Between 1990 and 2015, the Energy Information Administration reports U.S. energy productivity rose by 58 percent. Current efforts must accelerate substantially, however, to push the U.S. further along its path to meet the goal of further doubling energy productivity by 2030. Congressional support for the President's Budget Request for programs directed at improved energy efficiency will help us build on the progress already being made in this area.

QUESTIONS SUBMITTED BY SENATOR CHRISTOPHER A. COONS

IRAN AND INTERNATIONAL ATOMIC ENERGY AGENCY

Question. When I visited the IAEA in January, I was told that the agency needs a "reliable, long-term" source of funding to implement the JCPOA and accomplish broader non-proliferation goals. A recent GAO report said the IAEA faces potential budget and human resource challenges as a result of the JCPOA. Can you describe how the DOE is helping the IAEA overcome these challenges? How do our National Labs assist the IAEA's recruiting and hiring, which I understand is a very long and expensive process?

Answer. The Department of Energy (DOE) provides technical support to the International Atomic Energy Agency (IAEA) and voluntary financial contributions to the IAEA through reimbursable work agreements with the Department of State in support of the IAEA's safeguards mission. With these financial contributions, the IAEA is able to hire Americans into cost-free positions for 3–5 year assignments in the IAEA's Department of Safeguards supporting technology development and evaluation activities, software development and analysis positions, as well as IAEA training programs. The IAEA also can purchase needed safeguards monitoring equipment with these funds. In-kind technical support includes development of safeguards technology and concepts, periodic expert consultations, training support for IAEA inspectors, and analysis of samples through the IAEA's Network of Analytical Laboratories.

DOE also maintains a program of safeguards human capital development activities at our National Laboratories to attract, train, and retain experts in nonproliferation and IAEA safeguards efforts. This program brings undergraduate and graduate students into the laboratories on internships and fellowships and sends laboratory specialists out into the university environment to give seminars and training classes. The over-arching goal of this program is to ensure that there is a pipeline of talented individuals working within the DOE complex to support the IAEA; in many cases these individuals take up short-term or permanent positions directly with the IAEA.

As mentioned above, DOE works to ensure there is a pipeline of capable safeguards practitioners in the National Laboratory system. In support of sending as many of these individuals as practical to Vienna to work with the IAEA, DOE and the Department of State provide funding to the IAEA to hire our laboratory experts on 3–5 year assignments throughout the Department of Safeguards. Brookhaven National Laboratory maintains a recruitment list of prospective applicants from the laboratory and university systems and ensures that those individuals are regularly made aware of employment opportunities.

Question. Ali Akbar Salehi, head of the Atomic Energy Organization of Iran, reportedly announced that Iran will use part of its sanctions relief to hire and train a new generation of nuclear scientists. How will this training affect Iran's nuclear program in the next 15 years? How will an increased number of highly-trained nuclear scientists allow Iran to expand its nuclear program after much of the JCPOA "sunsets" in 15 years?

Answer. The Joint Comprehensive Plan of Action (JCPOA) significantly constrains the research and development that Iran's nuclear scientists can pursue. At the same time, the JCPOA redesigns and dismantles a significant portion of Iran's infrastructure, effectively cutting off Iran's pathways to a nuclear weapon.

Without the JCPOA, Iran would have an unconstrained R&D program. The JCPOA establishes strict limits on advanced centrifuge R&D, testing, and deployment in the first 10 years, and after the initial 10 year period Iran must abide by its enrichment and enrichment R&D plan submitted to the IAEA under the Additional Protocol, and pursuant to the JCPOA, which will result in certain limitations on enrichment capacity and ensure only a measured, incremental growth in its enrichment capacity consistent with a peaceful nuclear program.

The JCPOA in no way authorizes, allows, or encourages future Iranian nuclear weapons activity, which will always be prohibited under the Treaty on the Non-Proliferation of Nuclear Weapons. Instead, the JCPOA provides unparalleled insight into every part of Iran's nuclear program. Certain transparency measures will last for 15 years, others for 20 to 25 years, and some will last forever—such as Iran's adherence to the Additional Protocol. With this transparency, if Iran tried to reverse course and break out, we would see it and have time to respond with a much greater understanding of their program.

We expect a gradual development process to take place with respect to Iran's nuclear program past year 10. We expect this process to be shaped in such a way that it continues to build the world's confidence that Iran's program remains exclusively peaceful.

Certain transparency measures will last for 15 years, others for 20 to 25 years, and some will last forever—such as Iran's adherence to the Additional Protocol. With this transparency, if Iran tried to reverse course and break out, we would see it and have time to respond with a much greater understanding of their program.

SUBCOMMITTEE RECESS

Senator ALEXANDER. Mr. Secretary, thank you for joining us today. The subcommittee will stand adjourned.

[Whereupon, at 4:20 p.m., Wednesday, March 9, the subcommittee was recessed, to reconvene subject to the call of the Chair.]

ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2017

WEDNESDAY, MARCH 16, 2016

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

The subcommittee met at 2:34 p.m. in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander (chairman) presiding.

Present: Senators Alexander, Graham, Feinstein, and Udall.

DEPARTMENT OF ENERGY

NATIONAL NUCLEAR SECURITY ADMINISTRATION

STATEMENT OF LIEUTENANT GENERAL FRANK G. KLOTZ, U.S. AIR FORCE (Retired), UNDER SECRETARY FOR NUCLEAR SECURITY AND ADMINISTRATOR

ACCOMPANIED BY:

BRIGADIER GENERAL STEPHEN L. DAVIS, UNITED STATES AIR FORCE, PRINCIPAL ASSISTANT DEPUTY ADMINISTRATOR FOR MILITARY APPLICATIONS

ANNE HARRINGTON, DEPUTY ADMINISTRATOR FOR DEFENSE NUCLEAR NONPROLIFERATION

ADMIRAL JAMES F. (FRANK) CALDWELL, JR., UNITED STATES NAVY, DEPUTY ADMINISTRATOR FOR OFFICE OF NAVAL REACTORS

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. The Subcommittee on Energy and Water Development will please come to order.

As I was saying to Senator Feinstein, my co-chairman in effect, both Senator McConnell and Senator Schumer were saying yesterday that Senator McConnell hopes to begin the appropriations process on the floor on April 18. Senator Schumer said he intended to support having an appropriations process, and the Democrats have all written Senator McConnell saying they want one. It looks like everybody wants an appropriations process this year, so we're hoping very much that's possible. And Senator Feinstein and I will work with our House committee chairs to try to make ours one of the first bills that's available to the majority leader to bring to the floor. We hope to do it in a bipartisan way. And if there are controversial amendments, we hope those will be offered on the floor of the Senate rather than in the committee.

This afternoon, we are having a hearing to review the President's fiscal year 2017 budget request for the National Nuclear Security Administration. Senator Feinstein and I will each have an opening statement. I will then recognize each Senator for up to 5 minutes for an opening statement, alternating between the majority and the minority in the order in which they arrived.

We will then turn to our witnesses for their testimony. General Klotz will present testimony on behalf of the National Nuclear Security Administration. And we'll include the full written statements of all the witnesses in the record. After General Klotz, Senators will then be recognized for 5 minutes of questions each.

First, I would like to thank our witnesses for being here, and also Senator Feinstein, an exceptional co-chairman of this committee. We work together regardless of which party has the majority and usually come up with a pretty good result for the country.

Our witnesses today include Lieutenant General Frank Klotz, Administrator of the NNSA (National Nuclear Security Administration); Brigadier General S.L. Davis, Principal Assistant Deputy Administrator for Military Applications; Ms. Anne Harrington, Deputy Administrator for Defense Nuclear Nonproliferation; and Admiral Frank Caldwell, Deputy Administrator for Naval Reactors.

NNSA is a semi-autonomous agency within the Department of Energy that's responsible for a vital mission, managing our nuclear weapons stockpile, reducing global dangers posed by weapons of mass destruction, and providing the Navy with safe and effective nuclear power. This is the subcommittee's fourth hearing this year on the President's budget request.

NNSA has an important national security mission, but faces many challenges. We'll have to make some hard decisions on the most important priorities.

The President's 2017 budget request is $12.9 billion, an increase of 2.9 percent over the fiscal year 2016. The focus of my questions today will be on four main areas: one, keeping critical projects on time and on budget, that is a major priority of Senator Feinstein and of mine; two, effectively maintaining our nuclear weapons stockpile; three, supporting our nuclear Navy; and four, maintaining our vital nuclear workforce.

PROJECT OVERSIGHT

NNSA is responsible for three of the largest construction projects in the Federal Government: the Uranium Facility in Tennessee, the MOX Fuel Fabrication Facility in South Carolina; and the Plutonium Facility in New Mexico. Combined, these projects could cost more than $20 billion to build, and over the past 4 years, Senator Feinstein and I have worked hard to keep costs from skyrocketing. We want to make sure that hard-earned taxpayer dollars are spent wisely and that these projects are on time and on budget.

We have focused most of our oversight on the Uranium Facility in Tennessee for the past 5 years. We asked for a Red Team review headed by Oak Ridge National Laboratory Chief Thom Mason to review the project, which recommended ways to get it back on track. We said that the project had to be completed by 2025 with a cost of no greater than $6.5 billion and that the design had to be at least 90 percent completed before we even began construction

of the nuclear facility. We urged the Department to take aggressive steps to get costs under control so we could meet these goals.

The facility is off to a good start, but there is a lot more work to do. I am going to ask you more today about the Uranium Facility, particularly about your schedule for completing the design and when you anticipate construction can begin.

I would also like to discuss the MOX Facility in South Carolina. You have proposed that we stop construction of the MOX Fuel Fabrication Facility and recommended that Congress fund a different process called Dilute and Disposal. You've said the Dilute and Disposal alternative will cost less, actually a lot less, and get the material out of South Carolina much sooner than if we continue to fund MOX.

General Klotz, I am particularly interested in your plan for dealing with the 13 tons of plutonium that are currently in South Carolina, and ask that you address this either in your opening statement or questions.

EFFECTIVELY MAINTAINING NUCLEAR WEAPONS

Another major part of your budget maintains our nuclear weapons stockpile, and I want to make sure we're spending those dollars effectively. The budget request includes $1.3 billion to continue the four ongoing life extension programs, which fix or replace components in weapons systems to make sure they're safe and reliable. The work must be done, but life extension programs are very expensive, so they need to be properly managed. I will ask you about that today.

SUPPORTING OUR NUCLEAR NAVY

Naval Reactors is responsible for all aspects of nuclear power for our submarines and aircraft carriers. Naval Reactors has a lot on its plate right now. They are designing a new reactor core for the next class of submarines, refueling a prototype reactor, and building a new spent fuel processing facility. In addition, you have to support the day-to-day operation of 73 submarines and 10 aircraft carriers, including a total of 97 operating reactors. You have about the same number of operating reactors that we have in the commercial world.

The small nuclear reactors that Naval Reactors designs and oversees have had an impeccable safety record for more than 60 years. There has, I believe, never been a reactor accident.

While life extension programs provide the opportunity to maintain vital skills in many areas, now moving on to those, they do not exercise all of the skills needed for a healthy weapons program.

When I had the opportunity to talk to Admiral Caldwell about the Naval Reactors program last week, he told me about his technical base, the men and women who respond when our ships are at sea. I would like to hear more today about that.

[The statement follows:]

PREPARED STATEMENT OF SENATOR LAMAR ALEXANDER

We're here today to review the president's fiscal year 2017 budget request for the National Nuclear Security Administration, a semi-autonomous agency within the Department of Energy that is responsible for managing our nuclear weapons stock-

pile, reducing global dangers posed by weapons of mass destruction, and providing the Navy with safe and effective nuclear power.

This is the Subcommittee's fourth hearing this year on the president's budget request, and I look forward to hearing our witnesses' testimony.

The National Nuclear Security Administration, or NNSA, has an important national security mission, but faces many challenges. That's why we need to do what we were sent here to do—to govern.

Like last year, we will have to make some hard decisions so we can continue to fund the most important priorities.

The president's fiscal year 2017 budget request for the NNSA is $12.9 billion, an increase of $357 million (or 2.9 percent) higher than the fiscal year 2016 enacted level.

Today, I'd like to focus my questions on four main areas:

1) Keeping critical projects on time and on budget;
2) Effectively maintaining our nuclear weapons stockpile;
3) Supporting our nuclear Navy; and
4) Maintaining our vital nuclear workforce.

KEEPING CRITICAL PROJECTS ON TIME AND ON BUDGET

The NNSA is responsible for three of the largest construction projects in the Federal government: the Uranium Processing Facility in Tennessee; the MOX Fuel Fabrication Facility in South Carolina; and the Plutonium Facility in New Mexico.

Combined, these projects could cost more than $20 billion dollars to build, and over the past 4 years, Senator Feinstein and I have worked hard to keep costs from skyrocketing. We want to make sure hard-earned taxpayer dollars are spent wisely and that these projects are on time and on budget.

Senator Feinstein and I have focused much of our oversight on the Uranium Processing Facility in Tennessee over the past 5 years.

We asked for a Red Team review of the project, which recommended ways to get it back on track.

We said the project had to be completed by 2025 with a cost no greater than $6.5 billion, and the design had to be at least 90 percent completed before we began construction of the nuclear facilities. We urged the Department to take aggressive steps to get costs under control.

The Uranium Processing Facility is off to a good start, but there's a lot more work to be done.

I'm going to ask you more today about the Uranium Processing Facility, particularly about your schedule for completing the design and when you anticipate construction can begin.

I'd also like to discuss the MOX Fuel Fabrication Facility in South Carolina. The NNSA has proposed that we stop construction of the MOX Fuel Fabrication Facility and recommended that Congress fund a different process, called Dilute and Disposal.

You have said that the Dilute and Disposal alternative will cost less, and get the material out of South Carolina much sooner than it would if we continue to fund MOX.

General Klotz, I am particularly interested in your plan for dealing with the 13 tons of plutonium currently in South Carolina, and ask that you address this in your opening statement.

EFFECTIVELY MAINTAINING OUR NUCLEAR WEAPONS

Another major part of the NNSA's budget maintains our nuclear weapons stockpile, and I want to make sure we are spending taxpayer dollars effectively.

The budget request includes $1.3 billion to continue the four ongoing life extension programs, which fix or replace components in weapons systems to make sure they're safe and reliable.

This work must be done—but life extension programs are very expensive, so they need to be properly managed.

I will ask you today whether you will be able to meet your production deadlines on time and on budget.

SUPPORTING OUR NUCLEAR NAVY

Naval Reactors is responsible for all aspects of nuclear power for our submarines and aircraft carriers.

Naval Reactors has a lot on their plate right now—they are designing a new reactor core for the next class of submarines, refueling a prototype reactor, and building a new spent fuel processing facility.

In addition, Naval Reactors supports the day-to-day operations of 73 submarines and 10 aircraft carriers—including a total of 97 operating reactors.

The small nuclear reactors that Naval Reactors designs and oversees have had an impeccable safety record for more than 60 years; there has never been a reactor accident.

MAINTAINING OUR VITAL NUCLEAR WORKFORCE

While life extension programs provide the opportunity to maintain vital skills in many areas, they do not exercise all of the skills needed for a healthy weapons program.

When I had the opportunity to talk to Admiral Caldwell about the Naval Reactors program last week, he told me about his "technical base"—the men and women who respond when our nuclear ships at sea have a problem.

I'd like to hear more from the witnesses today about the challenges they face in maintaining the needed skills within their workforce, and what they are doing to make sure they have the right skills to meet their important missions.

Senator ALEXANDER. With that, I would recognize Senator Feinstein to make her opening statement.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thanks very much, Mr. Chairman, and I think you know how much I respect you. And to the panel, I want to say welcome. And this is one of the best parts of working in the Senate, that you can work with somebody you respect, that you work out differences of opinion that he gives on some, I give on some, and for some reason, it all works. I wish we could do more of that.

So thank you, Senator Alexander.

As you said, NNSA's overall request is a 3 percent increase in fiscal year 2016, but, and I want to talk about this for a minute, the nonproliferation program sees a 7 percent decrease, and I am a strong proponent of that program. Compared to 2010, the fiscal year 2017 request for weapons is a $2.9 billion increase. I think that's very difficult for me. The nonproliferation program request is a $300 million decrease from its peak in fiscal year 2012, General. The nonprogram is down $500 million, while weapons program's budget continues to climb. "Why?" I ask.

General, your appearance here today is 2 weeks before the final Nuclear Security Summit, where 50 countries will gather to discuss ways to further strengthen nuclear security measures and cooperation. I think it was in Prague in 2009 that President Obama committed to locking down all vulnerable nuclear materials in 4 years. That time has passed. The administration has made great strides toward that goal and has further reduced the dangers of nuclear terrorism since that time.

I'll give you a few examples: removal of over 3,800 kilograms of plutonium and highly enriched uranium; removal of 42,000 high-priority radioactive sources, such as cesium and kobalt, that can be used in a dirty bomb; conversion of 23 reactors from use of highly enriched uranium to low-enriched uranium; and installation of more than 400 fixed and mobile detectors in 43 countries. I congratulate you, and that's very important to me. And yet, even with these accomplishments, nuclear material is still obtainable and attractive to criminals and terrorists.

A recent article by the Center for Public Integrity brings some information on nuclear smuggling out of the shadows. There have been 20 reported nuclear material interdictions in Europe and Russia since the fall of the Soviet Union. In some cases, smugglers were attempting to move significant quantities of highly enriched uranium, and in others, it appears to just be small samples with the promise of bigger things. It has been openly reported that a cache of highly enriched uranium went missing in Russia after the end of the Cold War. The substantial success in securing border crossings around Russia is helping to prevent this material from making its way to the United States. The worsening economy in Russia, the rise of the Islamic State in particular, and I deal with a lot of that on the Intelligence Committee, and the fear that one group or another gets some form of dirty bomb, and the chaos spreading from the Middle East into Europe tells me now is not the time to let down our guard on nuclear security.

But on the weapons side of NNSA, all I see is unrestrained growth. I understand that the nuclear weapons complex needs to improve its infrastructure. No problem. NNSA reports a $3.2 billion facility maintenance backlog, and the $400 million increase in its fiscal year 2017 budget request is largely dedicated to halting the growth of that maintenance back deficit, as I understand, and obviously, I think we both support that.

But the budget for nuclear weapons just seems to keep growing. A 45 percent head—excuse me—increase since 2001. I almost said "hedge" because I very much believe that it's very wasteful to have a hedge at 3 to 1, and one day we have to have the courage to do something about that. But there is more to come. Warhead life extension programs, construction of the Uranium Processing Facility, the Plutonium Facility, the reactor for the *Ohio*-class replacement submarine, will all demand higher spending levels in the next 5 to 10 years, and this doesn't include projects for which NNSA has not budgeted for, such as new component manufacturing facilities or new science facilities.

According to your budget request, spending on weapons is projected to grow another $1.3 billion over the next 5 years to $10.5 billion. I'm really going to have a great deal of trouble supporting that. By comparison, the nonproliferation spending is projected to grow only $300 million. Importantly, that assumes that MOX, funded out of nonproliferation, is stopped, deemed to be too costly to continue to proceed with. So the question comes, What is the alternative and that cost?

In the area of warheads and new facilities, NNSA's management record, candidly, although I think it's better, does not inspire confidence. Rather, the history of cost growth and schedule slippages suggests that even more money will be required than currently projected. So where does it end and how much is enough? Outside of MOX, I don't see tough choices being made. I just see more money for weapons and less money for everything else.

Since it met its 2013 goals for locking down nuclear materials, NNSA has pushed out the goals and milestones for their nonproliferation efforts. For example, work in securing 4,400 radiological facilities that was to be completed by 2022 now won't be done until 2033, obviously extended by 10 years. In some cases, the

work has become more technically and diplomatically difficult, and we understand that, but it's also true that the nonprobudget has seen a steady decline since 2012.

Now, I don't believe we should or can sacrifice our ongoing efforts in nuclear security on the altar of our nuclear weapons stockpile. So I look forward to discussing this issue with you and our witnesses today. And I hope I can count on you to take a measured and reasonable approach to these matters.

So, General, thank you, and I welcome you.

Senator ALEXANDER. Senator Udall, would you like to make an opening statement?

STATEMENT OF SENATOR TOM UDALL

Senator UDALL. Yes, just briefly. And I don't think I'll take all my time, but I just want to welcome and greet General Klotz for being here.

I really enjoyed visiting with you in my office within the last week or so about many of the big issues facing the NNSA and the other witnesses here today, Deputy Administrator Harrington, Brigadier General Davis, and Admiral Caldwell. Thank you for being here and thank you for your service to the country. I think it's terrifically important the work that you do. And as you know, New Mexico's two national labs are a critical part of the NNSA's infrastructure and provide indispensable support for your mission to keep the Nation's stockpile safe, reliable, and secure.

At Sandia National Laboratory, they've hired 35 percent of their current staff in the last 5 years to support the life extension projects that are going on there. And at Los Alamos, the lab is embarking on plans to revitalize Cold War era infrastructure. And I couldn't agree more with both the chairman and the co-chairman that we need to keep our costs under control, but we also need to do the job right. I don't think there's any doubt about that.

I'm going to focus my questions today on when we talk about cost control, the big project they're working on at Sandia is the B61. The B61, the trend has been to keep it within budget and to do it on time, and I'm wondering, what are the lessons there? Because I think that we have done a good job in that respect.

And then I would like to ask about how much NNSA budgets need to increase to address the aging stockpile. You all know that that's an issue that's out there. And then there is a GAO report on the plutonium infrastructure strategy, and they raised some issues there, and I'm going to ask about that and where we're headed on that plutonium infrastructure strategy.

All of this costs money. We need to keep the budgets under control, but as I said, we need to do it right. And I thank you again for your service.

Mr. Chairman.

Senator ALEXANDER. Thanks, Senator Udall.

At this time, we'll turn to General Klotz, who will present testimony on behalf of the National Nuclear Security Administration.

General Klotz.

SUMMARY STATEMENT OF LIEUTENANT GENERAL FRANK G. KLOTZ

General KLOTZ. Thank you, sir.

Chairman Alexander, Ranking Member Feinstein, Senator Udall, thank you for the opportunity to present the President's fiscal year 2017 budget request for the Department of Energy's National Nuclear Security Administration. We value this committee's leadership in national security as well as its robust and abiding support for the missions and the people of NNSA.

As you rightly pointed out, our budget request, which comprises more than 40 percent of DOE's budget, is $12.9 billion, an increase of nearly $357 million, or 2.9 percent, over the fiscal year 2016 enacted level. The budget request continues the administration's unwavering commitment to NNSA's important and enduring missions. These missions are defined in the NNSA's Strategic Vision, which we released last year and which is available on our website, and they include to maintain a safe, secure, and effective nuclear weapons stockpile without nuclear explosive testing, to prevent, counter, and respond to the threat of nuclear proliferation and nuclear terrorism, and to support the capability of our nuclear-powered Navy to protect American and allied interests around the world.

To succeed, NNSA must maintain crosscutting capabilities that enable each of our core missions. These crosscuts focus on advancing science, technology, and engineering, supporting our people in modernizing our infrastructure, and developing a management culture focused on safety, on security, and on efficiency, adopting the best practices in use across the government as well as in the commercial world.

The budget materials and briefings that we have provided describe NNSA's major accomplishments in 2015 as well as the underlying rationale for our budget proposal for fiscal year 2017.

Let me just briefly highlight a few of the points here.

NUCLEAR WEAPONS STOCKPILE

First and foremost, the United States has maintained, as I said, a safe, secure, and effective nuclear weapons stockpile without nuclear explosive testing now for over 20 years. As a result of the funding provided by this Congress and supported by this subcommittee, and the significant improvements NNSA has made in program management over the past 2 to 3 years, all of our life extension programs, or LEPs, and major alterations are on schedule and within budget.

NNSA's science and technology base also continues to yield critical modeling and simulation data and to deploy increasingly capable high-performance computing in support of stockpile stewardship. Last year, for example, the National Ignition Facility at Lawrence Livermore Laboratory increased its shot rate, its experiment rate, from 191 in 2014 to 356 in 2015, an 86 percent increase. Our budget request also supports the recapitalization of NNSA's aging research and production infrastructure, most notably at the facilities where we perform our major uranium, plutonium, tritium, and other commodity operations. Of significance, NNSA completed the first sub-project for the Uranium Processing Facility at Oak Ridge, Tennessee, on time and millions of dollars under budget.

DEFENSE NUCLEAR NONPROLIFERATION

This year's request for the defense nuclear nonproliferation account, as has already been pointed out, is 6.8 percent lower than the fiscal 2016 enacted level, for two reasons. First, prior year carryover balances are available to execute several programs in this mission space. And secondly, we propose terminating the Mixed Oxide Fuel, or MOX, Fabrication Facility project.

While the administration remains firmly committed to disposing of surplus weapons grade plutonium, it is clear from independent analyses that the MOX fuel approach is unsustainable given the enormous costs involved. The already proven Dilution and Disposal alternative would enable the plutonium to be disposed of decades sooner than the MOX approach and at less than half the cost and with far fewer risks. In fact, 4.8 metric tons of plutonium have already been diluted and disposed of in this manner, demonstrating beyond doubt the feasibility of this approach.

The new approach will enable us to be more responsible stewards of taxpayer dollars while upholding our commitment to dispose of surplus weapons grade plutonium more quickly. That's why the President's fiscal year 2017 budget request proposes that the Department pursue the Dilution and Disposal approach as the path forward and begin termination of the MOX project.

In addition, the Department could dispose of all the surplus plutonium in South Carolina using the Dilute and Dispose approach under its current authorizations, getting the plutonium out of the State decades earlier than under the MOX approach.

NAVAL REACTORS PROGRAM

The request for our third appropriations, the Naval Reactors program keeps pace with mission needs and continues NNSA's commitment to three major initiatives: the *Ohio*-class reactor plant system development, the Land-Based S8G Prototype refueling overhaul in upstate New York; and the spent fuel handling recapitalization project in Idaho. And, of course, Admiral Caldwell is far better prepared than I to answer any questions that you may have in this area.

MANAGEMENT AND GOVERNANCE

For each of these missions, NNSA is driving improvements in management and governance. For all of our programs, we have instituted rigorous analyses of alternatives, defined clear lines of authority and accountability for Federal and contract program management, improved cost and schedule performance, and ensure that Federal project directors and contracting officers have the appropriate skill mix and professional certifications to effectively manage NNSA's work. Our budget request for Federal salaries and expenses reflects an increasing emphasis on improving program and project management across all of our mission pillars.

So in closing, the nuclear security enterprise continues to make significant process—progress. Through disciplined careful planning, consistent funding, and your continued strong support, we believe we can make smart investments to build on that progress and to meet new challenges in the future.

Again, thank you for the opportunity to appear before you today, and we look forward to addressing your questions.

[The statements follow:]

PREPARED STATEMENT OF LIEUTENANT GENERAL FRANK G. KLOTZ

Chairman Alexander, Ranking Member Feinstein, and Members of the Subcommittee, thank you for the opportunity to present the President's fiscal year 2017 budget request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). It is a pleasure to be here this afternoon. We value this Committee's strong support for the nuclear security mission, and for the people and institutions that are responsible for executing it.

The President's fiscal year 2017 budget request for NNSA is $12.9 billion, this is an increase of $357.5 million or 2.9 percent over the fiscal year 2016 enacted level. The request is approximately 43 percent of the DOE's total budget, and 67 percent of DOE's total 050 budget.

The NNSA has a unique and special responsibility to maintain a safe, secure, and effective nuclear weapons stockpile for as long as nuclear weapons exist; to prevent, counter, and respond to evolving and emerging nuclear proliferation and terrorism threats; to provide nuclear propulsion to our Navy as it protects American and Allied interests around the world; and to support our outstanding NNSA Federal workforce. By supporting overall growth, this budget request represents a strong endorsement of NNSA's vital and enduring missions, and is indicative of the Administration's unwavering commitment to a strong national defense.

NNSA's missions are accomplished through the hard work and innovative spirit of a highly talented Federal and Management and Operating (M&O) workforce committed to public service. To provide this team the tools they need to carry out their complex and challenging task, both now and in the future, we must continue to modernize our scientific, technical, and engineering capabilities and infrastructure. In doing so, we are mindful of our obligation to continually improve our business practices, and to be responsible stewards of the resources that Congress and the American people have entrusted to us.

The fiscal year 2017 budget request also reflects the close working partnership between NNSA and the Department of Defense (DoD). NNSA works closely with DoD to meet military requirements, support our Nation's nuclear deterrence capabilities and modernize the nuclear security enterprise. I would also note, that as in previous years, DoD is carrying in its fiscal year 2017 budget request separate funding in fiscal year 2018 and beyond that will be reallocated annually to NNSA's Weapons Activities and Naval Reactors.

I want to thank the committee for its support of the fiscal year 2016 budget request and look forward to your continuing support in fiscal year 2017. We have made some tough decisions and tradeoffs to meet both military commitments and nuclear security priorities. Without congressional support, modernization of our nuclear enterprise, implementation of our long-term stockpile sustainment strategy, and sustainment of our nonproliferation and prevention and response capabilities could be at risk. The program we have proposed is highly integrated and interdependent across the four accounts.

Details of the fiscal year 2017 budget request for the NNSA follow:

WEAPONS ACTIVITIES APPROPRIATION

For the Weapons Activities account, the fiscal year 2017 budget request is $9.2 billion, an increase of $396.2 million, or 4.5 percent above the fiscal year 2016 enacted levels. This account provides funds for the Defense Programs portfolio, which is responsible for all aspects of the stockpile stewardship, management, and responsiveness programs; the enterprise-wide infrastructure sustainment activities managed by our Office of Safety, Infrastructure, and Operations; NNSA's physical and cybersecurity activities; and the secure transportation of nuclear materials.

Maintaining the Stockpile

Last year, the work of the science-based Stockpile Stewardship Program (SSP) allowed the Secretaries of Energy and Defense to certify to the President for the 20th time that the American nuclear weapons stockpile remains safe, secure, and reliable, without the need for underground explosive nuclear testing. This achievement is made possible each year by essential investments in state-of-the-art diagnostic tools, high performance computing platforms, and modern facilities, which are staffed by NNSA's world-class scientists, engineers, and technicians.

For *Directed Stockpile Work* (DSW), the fiscal year 2017 budget request is $3.3 billion, a decrease of $57.3 million, or 1.7 percent below the fiscal year 2016 enacted levels. These reductions will not restrict NNSA's ability to annually assess system performance and reliability or maintain the schedule for Life Extension Programs (LEP).

The major LEPs are a fundamental part of this account. The $222.9 million requested for the W76–1 warhead LEP directly supports the Navy and will keep the LEP on schedule and on budget to complete production in fiscal year 2019. We continue to make good progress on the B61–12 LEP, which will consolidate four variants of the B61 gravity bomb and will improve the safety and security of the oldest weapon system in the U.S. nuclear arsenal. With the $616.1 million requested, we will remain on schedule to deliver the First Production Unit (FPU) in fiscal year 2020.

NNSA is responsible for the refurbishment of the nuclear explosives package and new bomb electronics, while the Air Force will provide the tail kit assembly under a separate acquisition program. When fielded, the B61–12 bomb will support both Air Force strategic long-range nuclear-capable bombers and dual-capable fighter aircraft, providing extended deterrence to our allies and partners, and allow retirement of the last megaton class weapon in the inventory, the B83 gravity bomb.

In July 2015, we began Phase 6.2 (Feasibility Study and Design Options) for the W80–4 cruise missile warhead LEP. The fiscal year 2016 budget request included $195 million to accelerate the FPU by 2 years to fiscal year 2025, a decision made by the Nuclear Weapons Council (NWC) in late 2014. The fiscal year 2015 budget request included $10 million to start the program. We had initially planned a ramp-up of Phase 6.2 study activities beginning in fiscal year 2016 to support the NWC FPU decision. However, as a result of the fiscal year 2016 continuing resolution, we were unable to begin the planned ramp-up activities until just recently. Furthermore, because of the delay in receiving fiscal year 2016 funding, the program cannot execute the full fiscal year 2016 enacted amount this year. As a result, a significant amount of the program's fiscal year 2016 funding will carry over into fiscal year 2017. Consequently, the fiscal year 2017 budget request is $25.3 million over the fiscal year 2016 budget request, rather than $117 million over the fiscal year 2016 budget request, as previously projected. While this delayed start will affect planned technology maturation activities in Phase 6.2A (Design Definition and Cost Study), we still fully expect to meet the planned FPU date in fiscal year 2025 to support the Air Force Long Range Stand Off (LRSO) program.

In fiscal year 2015, the NWC approved additional scope for the W88 Alteration (ALT) 370 to meet an emerging requirement. NNSA is now accelerating the new Conventional High Explosive (CHE) refresh work to match the original ALT schedule. As a result, we are synchronizing the full program to transition seamlessly to the Production Engineering phase in February 2017. In preparation for that phase transition, NNSA will publish a baseline cost report by the end of this fiscal year. This budget request reflects these efforts and includes $281.1 million in fiscal year 2017 to support the FPU in fiscal year 2020.

Also within DSW, the fiscal year 2017 budget request includes $1.3 billion for Stockpile Systems and Stockpile Services. These programs sustain the stockpile pursuant to the direction given in the President's Nuclear Weapon Stockpile Plan (NWSP). In doing so, the programs deploy unique skills, equipment, testers, and logistics to enable the daily operations of the nation's nuclear deterrent. Specifically, these programs produce and replace limited life components (LLCs) such as neutron generators and gas transfer systems, conduct maintenance, surveillance, and evaluations to assess weapons reliability, detect and anticipate potential weapons issues such as the recent CHE refresh issue mentioned above, and compile and analyze information during the Annual Assessment process.

The pursuit and application of technological advancements to enhance safety and security while reducing life cycle costs of the stockpile runs through all of these activities. The development of Integrated Surety Architectures enhancing transportation safety and security is an example of these efforts.

Within DSW, the fiscal year 2017 budget request also includes $577.8 million for the Strategic Materials account to maintain NNSA's ability to produce the nuclear and other materials needed to support the enduring stockpile. This program includes Uranium Sustainment, Plutonium Sustainment, Tritium Sustainment, Domestic Uranium Enrichment (DUE), lithium and other strategic materials. Funding for Uranium Sustainment will enable enriched uranium operations in Building 9212, a Manhattan Project-era production facility at the Y–12 National Security Complex in Oak Ridge, Tennessee, to end in fiscal year 2025, and allow the bulk of this obsolete building to shut down. The sustainment and modernization of en-

riched uranium capabilities and the acceleration of Area 5 de-inventory will reduce safety and mission risks in the near term.

Plutonium Sustainment funds replacement and refurbishment of equipment and the critical skills needed to meet the pit production requirements as outlined in the National Defense Authorization Act (NDAA) for fiscal year 2015.

Tritium Sustainment ensures the Nation's capability and capacity to provide the tritium necessary to meet national security requirements, either through production at Tennessee Valley Authority nuclear power plants or by recovering and recycling tritium from returned gas transfer systems.

The DUE program continues its efforts to ensure that we have the necessary supplies of enriched uranium for a variety of national security needs.

The fiscal year 2017 budget request also includes $69 million for Weapons Dismantlement and Disposition, an increase of $16.9 million, 32.7 percent above the fiscal year 2016 enacted level, which includes funds to support the President's goal to accelerate the dismantlement rate of previously retired weapons by 20 percent. This will enable NNSA to dismantle the weapons retired prior to fiscal year 2009 by 2021, rather than the original goal of 2022. It will also result in increased Management and Operating staff at both the Pantex Plant in Amarillo, Texas and the Y–12 National Security Complex.

For *Research, Development, Test, and Evaluation* (RDT&E), the fiscal year 2017 budget request is $1.9 billion, an increase of $36.2 million, 2 percent above the fiscal year 2016 enacted level. This includes $663.2 million for the Advanced Simulation and Computing (ASC) Program, an increase of $31 million for the Advanced Technology Development and Mitigation (ATDM) subprogram that supports high performance computing on the path to exascale, and $87.1 million for Advanced Manufacturing Development (AMD), a decrease of $43 million. The decrease reflects a realignment from technology development investments to address higher NNSA priorities. The budget request focuses on continued investment in advanced manufacturing opportunities and improving the manufacturing processes for components that support multiple weapons to maximize the benefits of these investments. Advanced Manufacturing invests in technologies that will reduce the time and cost of current manufacturing methods, replaces obsolete processes, and supports manufacturing developments for future weapon upgrades. Additive Manufacturing, also known as 3–D printing, aids in developing and manufacturing components for stockpile and weapon technology applications. The overall RDT&E request reflects small increases for the Science Program ($442.0 million, an increase of $18.9 million) to achieve two subcritical experiments per year before the end of the FYNSP, and begin alterations to U1a tunnel complex at Nevada to prepare for these experiments: Inertial Confinement Fusion Ignition and High Yield Program ($523.9 million, an increase of $11.9 million) and the Engineering Program ($139.5 million, an increase of $8.1 million).

The Inertial Confinement Fusion Ignition and High Yield program has spearheaded ongoing improvements in management and operational efficiencies at NNSA's major high energy density (HED) facilities, including the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL) in California and the OMEGA facility at the University of Rochester in New York. In fiscal year 2015, NIF markedly improved its shot-rate efficiency with over 350 key experiments performed (compared to 191 in fiscal year 2014) in support of the SSP. This level of effort represents an 85 percent increase over the previous year and an 18 percent increase over its goal for 2015.

NNSA has taken major steps in high performance computing to deliver on its missions and play a leading role to support the President's Executive Order on the National Strategic Computing Initiative (NSCI). In 2015, Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL) received the first hardware delivery for NNSA's next generation high performance computer, Trinity. This computer will initially have eight times more applications performance than the Cielo machine it is replacing. NNSA also continued its CORAL collaboration with LLNL, the DOE Office of Science national laboratories at Oak Ridge and Argonne, IBM, and other vendors. CORAL will help develop next generation computing platforms to dramatically improve our ability to run increasingly complex codes and will be a significant step on the path to exascale computing.

NNSA collaborates with the DOE Office of Science while making these much needed investments in exascale computing. The fiscal year 2017 budget request includes $95 million from NNSA for the development of capable exascale systems.

Defense Programs also maintains the vitality of the broader National Security Enterprise. An important aspect of this effort is investing in Laboratory-, Site- and Plant-Directed Research and Development (LDRD/PDRD). Independent reviews have consistently affirmed the importance of the program to the long-term vitality

of the labs. LDRD/PDRD provides basic research funding to foster innovation and to attract and retain young scientific and technical talent and is critical to the long-term sustainment of our national laboratories. Congressional support is essential to ensuring that we have both the workforce and the new developments necessary to support the nation's security into the future.

Improving Safety, Operations and Infrastructure

NNSA's ability to achieve its mission is dependent upon safe and reliable infrastructure. The age and condition of NNSA's infrastructure will, if not addressed, put the mission, the safety of our workers, the public, and the environment at risk. More than half of NNSA's facilities are over 40 years old while 30 percent of them date back to the Manhattan Project era. The fiscal year 2017 budget request for Infrastructure and Operations is $2.7 billion, an increase of $442.8 million, 19.4 percent above the fiscal year 2016 enacted level. This funding will help NNSA modernize and upgrade aging infrastructure and address safety and programmatic risks through strategic investments in both general purpose infrastructure and program-specific capabilities that directly support our nuclear weapons and nonproliferation programs.

To support critical programmatic activities, we are making important strides in recapitalizing our aging infrastructure and capabilities. In fiscal year 2015, NNSA funded new and continuing projects to enhance or replace programmatic capabilities and address the risks posed by the aging infrastructure. NNSA's investment in these projects is vital to the revitalization of the NNSA enterprise. The fiscal year 2017 budget request provides funding for more than 70 recapitalization projects. The request will also support general purpose infrastructure and program-specific capabilities through Line Item Construction projects. These projects include, for example, the Uranium Processing Facility (UPF), the Chemistry and Metallurgy Research Replacement (CMRR) project, the U1a Complex Enhancements Project (UCEP) in support of the Enhanced Capabilities for Subcritical Experiments (ECSE) portfolio, the Albuquerque Complex Project to replace the current inadequate facilities, and a project to expand the electrical distribution system at LLNL.

One of the most worrisome of the NNSA infrastructure challenges is the excess facilities that pose risks to our workers, the environment, and the mission. While many of these facilities will ultimately be transferred to the DOE Office of Environmental Management for disposition, NNSA is focusing on reducing the risk where it can. In fiscal year 2015, NNSA successfully demolished our second non-process contaminated building at Y–12 within the past two calendar years. The fiscal year 2017 budget request supports a number of activities to continue to address excess facilities. These activities include the transition of the Kansas City Bannister Federal Complex to the private sector for environmental remediation and redevelopment, risk reduction activities at Alpha-5 and Beta-4 at Y–12—both of which are highly process-contaminated—and disposition of more uncontaminated facilities across the NNSA enterprise.

Our *Secure Transportation Asset* (STA) program provides safe, secure movement of nuclear weapons, special nuclear material, and weapon components to meet projected DOE, DoD, and other customer requirements. The fiscal year 2017 budget request of $282.7 million includes an increase of $45.6 million, 19.2 percent above the fiscal year 2016 enacted levels, to continue asset modernization and workforce capability initiatives. These initiatives include: (1) restoration of Federal agent strength levels to meet the goal of 370; (2) the Safeguards Transporter (SGT) Risk Reduction Initiatives to manage the SGT beyond its design life; (3) development and testing of the selected alternative for the SGT replacement, the Mobile Guardian Transporter (MGT); and (4) replacement of vehicles and tractors.

The *Office of Defense Nuclear Security* (DNS) develops and implements sound security programs to protect Special Nuclear Material (SNM), people, information, and facilities throughout the nuclear security enterprise. The fiscal year 2017 budget request is $670.1 million, a decrease of $12.8 million, or 1.9 percent below the fiscal year 2016 the enacted level of $682.9 million due to one-time dedicated increases in fiscal year 2016. After adjusting for an fiscal year 2016 one-time $30 million designated plus up and $13 million dedicated line item construction amounts for each year, the remaining fiscal year 2017 operating request of $657.1 million is an increase of $17.2 million, or 2.7 percent above the fiscal year 2016 enacted operating level of $639.9 million. The request manages risk among important competing demands as NNSA continues to face the challenges associated with an aging physical security infrastructure that must be effectively addressed in the coming years. To this end, DNS is conducting a Site Condition Review (SCR) of the physical security systems at all locations to facilitate the development of an enterprise-wide security systems upgrade and refresh strategy. This effort will identify and manage current

and future security improvements and upgrades on a 10-year planning cycle and includes determining the condition of critical security equipment and infrastructure. A final report of this effort will provide DOE/NNSA leadership and Congressional stakeholders with consolidated and up-to-date information to enable informed decisions for fiscal planning and programming.

The SCR is being conducted within the context of important organizational improvements and management strategies published in the June 2015 Security Roadmap. The document establishes a clear vision and path forward to correcting identified security issues and promoting sustained performance within the NNSA security program. The Security Roadmap is a multi-year effort that implements key recommendations for improvement identified in past assessments; it includes a total of 57 strategic initiatives covering culture, process, infrastructure, and workforce challenges. As of the end of 2015, DNS has completed six of the initiatives and is currently working on another 20 initiatives. The remaining 31 initiatives are pending formal initiation.

For *Information Technology and Cybersecurity*, the fiscal year 2017 budget request is $176.6 million, an increase of $19 million, or 12.1 percent above fiscal year 2016 enacted levels. This increase will fund much needed improvement to the Information Technology and Cybersecurity program, including Continuous Diagnostic and Mitigation (CDM), Telecommunications Security, infrastructure upgrades for the Enterprise Secure Computing Network (ESN), Public Key Infrastructure (PKI), Energy Sciences Network (ESnet) program, and an increased Information Technology budget. This cybersecurity program continuously monitors enterprise wireless and security technologies (e.g., identity, credential, and access management) to meet a wide range of security challenges. In fiscal year 2017, NNSA plans to continue the recapitalization of the Enterprise Secure Network, modernize the cybersecurity infrastructure, implement the Identity Control and Access Management project at NNSA Headquarters and site elements, and implement all Committee on National Security Systems and PKI capabilities.

DEFENSE NUCLEAR NONPROLIFERATION APPROPRIATION

The Defense Nuclear Nonproliferation (DNN), fiscal year 2017 budget request is $1.8 billion, a decrease of $132.4 million, 6.8 percent below the fiscal year 2016 enacted levels. This appropriation covers NNSA's nuclear threat reduction mission. DNN addresses the entire nuclear threat spectrum by helping to prevent the acquisition of nuclear weapons or weapon-usable materials, technologies, and expertise, countering efforts to acquire such weapons, materials, and technologies, and responding to nuclear and radiological incidents. The fiscal year 2017 budget request funds two mission areas under the DNN appropriation: the Defense Nuclear Nonproliferation Program and the Nuclear Counterterrorism and Incident Response (NCTIR) Program.

Nonproliferation Efforts

NNSA made significant progress in nuclear threat reduction in 2015. Working with foreign partners, the Office of Defense Nuclear Nonproliferation removed approximately 170 kilograms of highly enriched uranium (HEU) and plutonium from several civilian sites; successfully down- blended additional HEU to achieve a cumulative total of 150 metric tons of U.S. excess, weapons-usable HEU (approximately 6,000 nuclear weapons worth of material); recovered more than 100,000 curies of disused or orphaned radioactive material; ensured the United States remains on track to fulfill the commitments made at the 2014 Nuclear Security Summit; and supported the Secretary of Energy's efforts to develop the Joint Comprehensive Plan of Action (JCPOA) by providing scientific expertise and technical options to the United States negotiating team.

The *Material Management and Minimization* (M^3) program provides an integrated approach to addressing the threat posed by nuclear materials through a full cycle of materials management and minimization. The primary objective of the program is to achieve permanent threat reduction by minimizing and, when possible, eliminating weapons-usable nuclear material around the world. The fiscal year 2017 budget request is $341.1 million, an increase of $24.5 million, 7.7 percent above the fiscal year 2016 enacted levels. This funding increase will accelerate reactor conversions in Kazakhstan and in the United States, as well as initiate the critical decision process to support the dilute and dispose program for domestic plutonium disposition.

The *Global Material Security* (GMS) program works with partner nations to increase the security of vulnerable nuclear and radiological materials and improve their ability to detect, interdict, and investigate illicit trafficking of these materials. The fiscal year 2017 budget request for this program is $337.1 million, a decrease

of $89.6 million, 21 percent below the fiscal year 2016 enacted level. This decrease is possible because GMS is completing its work to protect the remaining International Atomic Energy Agency (IAEA) Category I radiological sources in the United States to meet our 2014 Nuclear Security Summit commitment, and because GMS is committed to reducing its prior year carryover balances.

The *Nonproliferation and Arms Control* (NPAC) program supports the nonproliferation and arms control regimes by developing and implementing programs to strengthen international nuclear safeguards; control the spread of nuclear and dual-use material, equipment, technology and expertise; verify nuclear reductions and compliance with nonproliferation and arms control treaties and agreements; and address other nonproliferation and arms control challenges. The fiscal year 2017 budget request will fund safeguards and export control activities, including efforts specifically in support of JCPOA implementation. This funding also supports statutorily mandated activities such as technical reviews of export licenses and interdiction cases, technical support for the negotiation and implementation of civil nuclear cooperation agreements (123 Agreements), and upgrades to the 10 CFR 810 authorization process. The fiscal year 2017 budget request for this program is $124.7 million, a decrease of $5.5 million, 4.2 percent below the fiscal year 2016 enacted level. This decrease primarily reflects a return to baseline funding following the one-time increase of $3.5 million by Congress in the fiscal year 2016 budget for improvements in the export control process, as well as cost-savings in export licensing activities achieved through operational efficiencies.

The *DNN Research and Development* (DNN R&D) program supports innovative unilateral and multi-lateral technical capabilities to detect, identify, and characterize (1) foreign nuclear weapons programs, (2) illicit diversion of special nuclear materials, and (3) nuclear detonations. To meet national and Departmental nuclear security requirements, DNN R&D leverages the unique facilities and scientific skills of DOE, academia, and industry to perform research, including counterterrorism-related R&D. The fiscal year 2017 budget request for this program is $393.9 million, a $25.4 million or 6.1 percent decrease below fiscal year 2016 enacted levels. The decrease in funding reflects projected savings resulting from a reduction in planned activities for arms control-related R&D and a return to the baseline Nuclear Detonation Detection (NDD) program after development of an initial mitigation path for supply chain interruptions.

Nonproliferation Construction consolidates construction costs for DNN projects. Currently, the MOX Fuel Fabrication Facility (MFFF) is the only project in this program; however, the fiscal year 2017 budget request terminates the MOX project. The Department will complete pre-conceptual design for the dilute and dispose approach to establish Critical Decision-0 (CD–0), Approve Mission Need, and begin conceptual design in late fiscal year 2017. The fiscal year 2017 budget request of $270 million will be used to bring an orderly and safe closure of the MFFF. The scope and costs will be refined in subsequent budget submissions when the termination plan for the MFFF project is approved.

Nuclear Counterterrorism and Emergency Operations

DOE has adopted an enterprise-wide approach to strengthen overall preparedness to respond to a broad spectrum of potential emergencies. These emergencies include natural phenomena, such as adverse weather events or earthquakes, and man-made events, such as accidents or acts of terrorism. To better accomplish this mission, in November 2015, NNSA reorganized the Office of Emergency Operations and the Office of Counterterrorism and Counterproliferation.

Both of these organizations are supported under the Nuclear Counterterrorism and Incident Response (NCTIR) Program. In fiscal year 2016, the NCTIR program transitioned to the DNN account in order to align all NNSA funding to prevent, counter, and respond to nuclear proliferation and terrorism. The fiscal year 2017 budget request includes $271.9 million to support the NCTIR program, an increase of $37.5 million, 16 percent above the fiscal year 2016 enacted level. Within NCTIR, NNSA continues to work domestically and around the world to prepare for and improve our ability to respond to radiological or nuclear incidents.

Our counterterrorism and counterproliferation programs are part of broader U.S. Government efforts assessing the threat of nuclear terrorism and to develop technical countermeasures. The scientific knowledge generated under this program ensures that NNSA's technical expertise on nuclear threat devices, including improvised nuclear devices (INDs), supports and informs broader U.S. Government nuclear security policy and guides nuclear counterterrorism and counterproliferation efforts, including interagency nuclear forensics and DoD contingency planning.

NNSA's emergency response teams must deploy and respond with the most up to date equipment. The current equipment is aging, increasing maintenance expenses,

and has started to impact NNSA's ability to perform its emergency response mission. The Radiological Assistance Program (RAP) remains the nation's premier first-response resource to assess a radiological incident and advise decision-makers on necessary steps to minimize hazards, but its effectiveness is beginning to be compromised by obsolete equipment. To ensure that NNSA is able to execute its radiological emergency response mission, RAP's equipment must be recapitalized regularly. Additionally, NNSA is acquiring state-of-the-art, secure, deployable communications systems that are interoperable with our Federal Bureau of Investigation and DoD mission partners, ensuring decision makers receive real-time technical recommendations to mitigate nuclear terrorist threats.

The Office of Emergency Operations is now aligned to focus on its core Department-wide all- hazards and complex-wide emergency management mission. The fiscal year 2017 budget request for this office is $34.7 million, an increase of $9.6 million, or 38 percent above the fiscal year 2016 enacted level. This will improve the emergency management system through an enterprise-wide approach that effectively increases the Department's all-hazards emergency preparedness and response capability during complex, cascading, or enduring incidents, and more effectively calls upon and leverages the assets, resources, and skills across the DOE complex. The Emergency Operations Center (EOC) will continue to be the 24/7/365 single-point-of-contact for Departmental and interagency notifications regarding situations requiring centralized management such as, national emergencies, heightened international tension, Departmental emergencies, natural disasters, or acts of terrorism. The program also manages the Emergency Communications Network, and Continuity Programs for all of DOE, including NNSA. The Office of Emergency Operations will continue to work within the DOE to develop plans to replace the existing EOC and to improve the Department's capabilities to respond to emergencies.

NAVAL REACTORS APPROPRIATION

Advancing Naval Nuclear Propulsion

NNSA supports the U.S. Navy's ability to protect and defend American interests across the globe. The Naval Reactors Program remains at the forefront of technological developments in naval nuclear propulsion and ensures a commanding edge in warfighting capabilities by advancing new technologies and improvements in naval reactor performance and reliability.

In 2015, Naval Reactors enabled U.S. nuclear powered warships to operate for another year safely and effectively, steaming more than two million miles in support of national security missions. Initial reactor start-up was achieved in the lead reactor plant of pre-commissioning unit (PCU) *Gerald R. Ford* (CVN 78), the first new design aircraft carrier propulsion plant in 40 years. This historic milestone represents the culmination of almost 20 years of dedicated and sustained effort by Naval Reactors and its field activities, our Department of Energy laboratories, nuclear industrial base suppliers, the Navy design team and the nuclear shipbuilders. This is the first step in fully testing the integrated operations of the propulsion plant, culminating in sea trials this spring. Finally, we continued our reactor plant design and reactor core manufacturing development efforts in support of the new design *Ohio*-class Replacement reactor plant, including the life-of-ship core.

The *Naval Reactors* fiscal year 2017 budget request is $1.42 billion, an increase of $45 million, 3.2 percent above the fiscal year 2016 enacted level. In addition to supporting today's operational fleet, the requested funding will enable Naval Reactors to deliver tomorrow's fleet by funding three national priority projects, and recruiting and retaining a highly skilled work force committed to the Navy and the nation. The projects include (1) continuing design of the new reactor plant for the replacement of the *Ohio*-class SSBN, which will feature a life-of-ship core and electric drive; (2) refueling a Research and Training Reactor in New York to facilitate *Ohio*-class Replacement reactor development efforts and provide 20 more years of live reactor based training for fleet operators; and (3) building a new spent fuel handling facility in Idaho that will facilitate long term, reliable processing and packaging of spent nuclear fuel from aircraft carriers and submarines.

Naval Reactors has requested funding in fiscal year 2017 to support these projects, and to fund necessary reactor technology development, equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing a small but high-performing technical base, the teams at our four Program sites—the Bettis Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and our spent nuclear fuel facilities in Idaho—we can perform the research and development, analysis, engineering and testing needed to support today's fleet at sea and develop future nuclear- powered warships. Importantly, our labs perform the technical evaluations

that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses that ensure nuclear safety and maximize operational flexibility. This technical base supports more than 15,000 nuclear-trained Navy sailors, who safely maintain and operate the 98 nuclear propulsion plants in the fleet 24 hours per day, 365 days per year around the globe. It will also facilitate delivery, as directed by Congress, of our conceptual plan for potential naval application of low enriched uranium.

NNSA FEDERAL SALARIES AND EXPENSES APPROPRIATION

The NNSA *Federal Salaries and Expenses* (FSE) fiscal year 2017 budget request is $412.8 million, an increase of $49.1 million, 13.5 percent above the fiscal year 2016 enacted level. The fiscal year 2017 budget request provides funding for 1,715 full-time equivalents (FTE) and support expenses needed to meet mission requirements. We are actively engaged in hiring to that number in a thoughtful and strategic manner. The fiscal year 2017 budget request will support 1,715 FTEs, an increase of 60 FTEs (25 above the authorized 1,690) above the anticipated number of FTEs in fiscal year 2016, and request an additional 25 for a total of 1,740 FTEs in fiscal year 2018 and the outyears. The exact number of FTEs will be determined following a detailed staffing review. It also provides for a 1.3 percent cost of living increase and a 5.5 percent increase for benefit escalation. In addition, the request provides funding for additional Federal Background Investigations for security clearances and provides additional funding to the Department's Working Capital Fund, primarily for Office of Personnel Management (OPM) credit monitoring and the Department's accounting systems (iMANAGE).

In fiscal year 2017, NNSA will continue its efforts to meet current and future workforce needs by analyzing how evolving missions are affecting job requirements. Reshaping of the workforce over the next several years will be essential, including identifying the right staffing size and skill sets and implementing professional development plans now and in the future. NNSA will also continue to streamline its operations, particularly in travel and support services, to provide a lean and efficient organization.

MANAGEMENT AND PERFORMANCE

To enhance our ability to carry out our mission and execute this budget request, we will continue to focus on improving our project management and cost estimating capabilities. In keeping with the Secretary of Energy's increased focus on Management and Performance, NNSA is committed to managing its operations, contracts and costs in an effective and efficient manner. The NNSA's Office of Acquisition and Project Management (APM) is driving continued improvement in contract and project management practices. APM is leading NNSA's effort to institute rigorous analyses of alternatives, provide clear lines of authority and accountability for Federal and contractor program and project management, improve cost and schedule performance, and ensure Federal Project Directors and Contracting Officers with the appropriate skill mix and professional certifications are managing NNSA's work. NNSA participates in the Secretary of Energy's Project Management Risk Committee as a means to institutionalize and share best practices across the Department. NNSA established the Office of Project Assessments, reporting directly to the Principal Deputy Administrator, ensuring senior leadership visibility and accountability throughout the Enterprise for project performance. This office generated $33 million in cost avoidances as a result of their independent project peer reviews.

Since 2011, NNSA has delivered approximately $1.4 billion in projects, a portion of NNSAs total project portfolio, $70 million (or 5 percent) under original budget. Significant examples in the last year include the Uranium Processing Facility (UPF) Site Readiness Subproject, which delivered $20 million under budget; Y–12's Nuclear Facility Risk Reduction Project, which delivered $6 million under budget and 11 months ahead of schedule; and LANL's Transuranic Waste Facility Project, which is on track to complete $3 million under budget. Using the Department's best practices, the UPF and Chemistry and Metallurgy Research Replacement Facility Projects were restructured into smaller more manageable subprojects, significantly reducing project delivery risk.

NNSA is committed to encouraging competition and increasing the universe of qualified contractors, by streamlining its major acquisition processes. The most significant example was the competitive award of the Kansas City National Security Campus M&O contract, awarded without protest, saving taxpayers $150 million and increasing the use of small businesses. As an affirmation of the quality of NNSA's acquisition management team, only four out of 103 competitive procurements were protested, with NNSA winning all protests. Finally, NNSA exceeded its small busi-

ness goal by over 20 percent, awarding $233 million to small business in fiscal year 2015.

NNSA will continue to focus on delivering timely, best-value acquisition solutions for all of our programs and projects. NNSA will use a tailored approach to contract structures and incentives that is appropriate for the unique missions and risks at each site. Our M&O contractors are responsible for disparate activities, ranging from research and development to industrial production. Accordingly, we will work to develop the right incentives for each circumstance and for each of our contracts.

COST ESTIMATING AND PROGRAM EVALUATION

The Office of Cost Estimating and Program Evaluation (CEPE) continues to develop its capabilities to provide trusted independent cost and resource analysis of NNSA's programs and projects. As detailed in its implementation plan, the number of CEPE Federal staff will grow from a target of 15 in fiscal year 2016 to 18 in fiscal year 2017. CEPE will conduct independent cost estimates on the B61–12 LEP and W88 Alt 370 in fiscal year 2016 and the W80–4 LEP in fiscal year 2017. CEPE is also institutionalizing best practices for analysis of alternatives and leads the corporate process to build the NNSA budget.

CONCLUSION

The NNSA performs vital activities at home and throughout the world in support of the nuclear security mission. Its success in addressing 21st century challenges hinges upon the technology, capabilities, and infrastructure entrusted to the organization.

Again, thank you for the opportunity to appear before you today.

PREPARED STATEMENT OF ADMIRAL JAMES F. CALDWELL

A strong Navy is crucial to the security of the United States. Navy warships are deployed around the world every hour of every day to provide a credible "forward presence." With over 45 percent of the Navy's major combatants being nuclear powered, including 10 aircraft carriers, 14 ballistic missile submarines, 55 attack submarines, and 4 guided missile submarines—it is vital that these ships are ready when and where our Nation needs them. In addition to supporting these nuclear powered combatants, Naval Reactors has also safely maintained and operated two nuclear powered land-based prototypes—both over 38 years old—to conduct research and development and two Moored Training Ships—both over 51 years old—the oldest operating pressurized water reactors (PWRs) in the world. These land-based prototypes, Moored Training Ships, and Naval Nuclear Power Training Command train over 3000 sailors per year to operate our naval nuclear propulsion plants.

Our ballistic missile submarine force remains on patrol, marking over 60 years of peacekeeping capability through strategic deterrence. The Navy had 34 submarine deployments and 26 strategic deterrent patrols during 2015. In addition, at any given time, there were always at least 56 of 71 submarines deployed or on stand-by to deploy within a few days. Our carriers, USS *Carl Vinson* (CVN 70) and USS *Theodore Roosevelt* (CVN 71) completed successful deployments to the Central Command area of responsibility, and the USS *Ronald Reagan* (CVN 76) turned over with the USS *George Washington* (CVN 73) to serve as the forward-deployed carrier in Japan.

This past year, we also saw the christening of the attack submarine PCU *Illinois* (SSN 786) and keel laying for the PCU *Colorado* (SSN 788) and PCU *Indiana* (SSN 789), our fifteenth and sixteenth *Virginia*-class submarines. We've also added another attack submarine to our force by commissioning USS *John Warner* (SSN 785), and began a program that delivers two *Virginia*-class submarines annually. In 2015, we laid the keel for the second *Ford*-Class CVN, PCU *John F. Kennedy* (CVN 79). We currently have 12 submarines and one next generation aircraft carrier in various phases of construction at our shipyards. Initial reactor start-up was achieved in the lead reactor plant of PCU *Gerald R. Ford* (CVN 78), the first new design aircraft carrier propulsion plant in 40 years. This historic milestone represents the culmination of almost 20 years of dedicated and sustained effort by Naval Reactors and its field activities, our Department of Energy laboratories, nuclear industrial base suppliers, the Navy design team and the nuclear shipbuilders. This is the first step in fully testing the integrated operations of the propulsion plant, culminating in sea trials this spring. Finally, we continued our reactor plant design and reactor core manufacturing development efforts to support of the new design *Ohio*-class Replacement reactor plant, including the life-of-ship core.

The firm support of this subcommittee last year enabled safe operation of the fleet, Naval Reactors mandatory oversight, and continued progress on key projects. Naval Reactors' budget request for fiscal year 2017 will continue this work. The funding request is for $1.420 billion, an increase of $45 million (3 percent) over the fiscal year 2016 enacted funding level. In addition to supporting today's operational fleet, the requested funding will enable Naval Reactors to deliver tomorrow's fleet by funding three national priority projects and recruiting and retaining a highly skilled work force committed to the Navy and the nation. The projects are:

—Continuing to design the new reactor plant for the replacement of the *Ohio*-class ballistic missile submarine, which will feature a life-of-ship core and electric drive;

—Refueling a Research and Training Reactor in New York, to facilitate *Ohio*-class Replacement reactor development efforts and provide 20 more years of live reactor based training for the fleet operators; and

—Building a new spent fuel handling facility in Idaho that will facilitate long term, reliable processing and packaging of spent nuclear fuel from aircraft carriers and submarines.

Naval Reactors has requested funding in fiscal year 2017 to support these projects, and to fund necessary reactor technology development, equipment, construction, maintenance, and modernization of critical infrastructure and facilities. By employing a small but high-performing technical base, the teams at our four Program sites—the Bettis Atomic Power Laboratory in Pittsburgh, the Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and our spent nuclear fuel facilities in Idaho—we can perform the research and development, analysis, engineering and testing needed to support today's fleet at sea and develop future nuclear-powered warships. Importantly, our labs perform the technical evaluations that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses that ensure nuclear safety and maximize operational flexibility. This technical base supports more than 15,000 nuclear-trained Navy sailors, who safely maintain and operate the 97 nuclear propulsion plants in the fleet 24 hours per day, 365 days per year around the globe. It will also facilitate delivery, as directed by Congress, of our conceptual plan for potential naval application of low enriched uranium.

The requested increase in funding is also required to support the planned ramp up of design efforts for the new reactor plant for the *Ohio*-class SSBN Replacement—the Navy's number one acquisition priority. Providing unparalleled stealth, endurance, and mobility, our ballistic missile submarine force has delivered more than 60 years of continuous at-sea deterrence, and continues to be the most survivable leg of the nuclear triad. *Ohio*-class Replacement SSBN activity this year includes reactor plant design and component development to support procurement of long lead components starting in fiscal year 2019. Progress in these areas in fiscal year 2017 maintains schedule alignment with the Navy as the program moves forward to construction start in fiscal year 2021 while retiring technical risk and targeting cost reduction.

Related to *Ohio*-class Replacement and the Program's training needs, the fiscal year 2017 budget request will support the land-based prototype refueling overhaul at the Kesselring Site in upstate New York. In fiscal year 2017, Naval Reactors will continue the core manufacturing work needed for the refueling overhaul, which will also enable timely construction of the life-of-ship core for *Ohio*-class Replacement. Further, plant service-life engineering design will be completed in fiscal year 2017 to ensure that the land-based prototype overhaul, performed concurrently with refueling, supports 20 additional years of research, development and training.

The Naval Reactors fiscal year 2017 budget request also contains funds to continue the Spent Fuel Handling Recapitalization Project. After many years of funding reductions, Naval Reactors greatly appreciates Congressional support for this much needed project in fiscal year 2016, where we received the full request of $86 million. Congressional support in 2016 enabled progress, design, and planning for site preparations and long lead material procurements in fiscal year 2017. We will use the $100 million requested in fiscal year 2017 to finalize key facility and equipment requirements and advance facility design to support establishing the Performance Baseline in fiscal year 2018 and the start of construction in fiscal year 2019. Continued Congressional support will help ensure that the facility in Idaho is ready to receive spent nuclear fuel from the fleet in fiscal year 2025. Because the new facility's capabilities are required to support aircraft carrier refuelings and defuelings, any delay to the project schedule would require procurement of additional shipping containers to temporarily store naval spent nuclear fuel at a cost of approximately $150 million for each year the project is delayed.

At the requested funding level, Naval Reactors can safely maintain and oversee the nuclear-powered fleet. Naval Reactors can also continue to advance the *Ohio*-class Replacement and Land-based Prototype Refueling Overhaul, continue progress on the Spent Fuel Handling Recapitalization Project, and meet our environmental responsibilities.

Naval Reactors is committed to executing our projects on time and on budget, and continuing the search for the safest and most cost effective way to support the nuclear fleet. I respectfully urge your support for aligning funding allocations with the fiscal year 2017 budget request.

Senator ALEXANDER. Thanks, General Klotz.

We will now begin a round of questions.

URANIUM PROCESSING FACILITY

I want to ask about the big construction projects. And let me take just a minute on the Uranium Facility before I go to MOX. When do you expect the design to be 90 percent complete?

General KLOTZ. We expect the design for the project to be 90 percent complete at the—towards the end of next year, 2017.

Senator ALEXANDER. So that means you would expect to begin construction of the Uranium Facility toward the end of 2017?

General KLOTZ. We might not actually begin construction at that time. I would have to give you a specific time in terms of which we actually begin construction, but as you know, because, as you rightly pointed out, we meet routinely with you, Senator, and with Senator Feinstein, to go over that. And, in fact, our staffs are working to schedule, as soon as we get past the budget hearings, a discussion on that. But as you know, we have broken the overall project up into several sub-projects, one of which the site rating sub-project, as I mentioned in the opening statement, was completed last year, February of last year, for $65 million, which was $20 million under the budget.

Senator ALEXANDER. Well, I congratulate you on that, and I think it's important to point out that over the last 5 years that project has gone from skyrocketing out of control to a managed process. Are you on a path that you believe is on time and on budget, meaning no more than $6.5 billion by 2025?

General KLOTZ. Yes, sir. As recommended by the Red Team, chaired by Dr. Thom Mason, the director of Oak National Laboratory, we are implementing every one of the recommendations in that, and we are going to deliver that facility at $6.5 billion by 2025.

MIXED OXIDE FUEL FABRICATION FACILITY

Senator ALEXANDER. Since we're talking about billions, let's go to MOX. You said the Dilute and Dispose procedure could be less than half the cost of the current MOX procedure. What kind of dollars are we talking about?

General KLOTZ. We have conducted several reviews over the past year, one by another Red Team chaired by Dr. Mason, of Oak Ridge National Laboratory, and two congressionally mandated independent assessments by The Aerospace Corporation. Consistently these reviews have concluded that the projected life-cycle cost of the MOX fuel approach for plutonium disposition will be in the range of $30 to $50 billion, and possibly even higher, and will re-

quire approximately $800 million to $1 billion annually for decades to come for the life of the MOX fuel program.

Senator ALEXANDER. And the cost of the alternative proposal?

General KLOTZ. Half or better.

Senator ALEXANDER. So we're talking about, according to those figures, saving a half billion dollars a year?

General KLOTZ. Yes, sir. Or as the Secretary testified just a week ago at this very same place, perhaps maybe even more.

Senator ALEXANDER. How much excess plutonium is covered under the agreement with Russia?

General KLOTZ. Sir, 34 metric tons.

Senator ALEXANDER. And how much excess plutonium is actually in South Carolina?

General KLOTZ. Approximately 13 metric tons.

Senator ALEXANDER. Can all of those 13 tons in South Carolina be sent to WIPP (Waste Isolation Pilot Plant), that is, in New Mexico, under current law?

General KLOTZ. Yes, sir, that is correct. And, in fact, in December of just last year, DOE issued its preferred alternative for disposing of 6 metric tons at Savannah River, not under the Plutonium Management Disposition Agreement that you were referring to, by diluting it and disposing of it at WIPP. And we are now in the process of finalizing a record of decision, announcing the decision to prepare 6 metric tons for eventual disposal at WIPP, and we can also, under existing statutory authorities, we can put the other 7 metric tons that are at Savannah River into WIPP.

Senator ALEXANDER. So there are 13 tons of plutonium in South Carolina.

General KLOTZ. That is correct.

Senator ALEXANDER. Six of them, six of those tons, have nothing to do with the Russian agreement.

General KLOTZ. Yes, sir.

Senator ALEXANDER. Seven do.

General KLOTZ. Yes, sir.

Senator ALEXANDER. And you're going to take—which tons go first to New Mexico?

General KLOTZ. The six that are not part of the agreement.

Senator ALEXANDER. And under existing agreements, there is room in the New Mexico facility for all 13 tons.

General KLOTZ. That is correct, sir.

Senator ALEXANDER. You have previously stated that nearly 5 tons of plutonium have already been disposed of at WIPP using the same process you plan to use for the 6 tons in South Carolina that have nothing to do with the Russian agreement. So is the process of disposing of plutonium by Dilute and Dispose well understood? Are you comfortable with it? Is it a competent process?

General KLOTZ. Yes, sir. As I said, we have done it before. We understand how to do that process, and it's very well understood.

Senator ALEXANDER. How long will it take to complete the disposal of the 6 tons of material in South Carolina that are not part of the Russian agreement?

General KLOTZ. Well, we'll have to do some things to speed up our capability of doing that. Right now, DOE plans to ramp up operations at Savannah River to dilute a small quantity, perhaps 150

kilograms per year of plutonium, over the next 2 to 3 years. We would also further increase throughput to approximately half a metric ton per year for a relatively small amount of funding, say, $5 million over 3 years.

Additionally, NNSA has already begun design work with money that was appropriated in the 2016 appropriations bill for two additional glove boxes that will increase our ability to dilute to over 1 metric ton a year, and we expect these glove boxes to be in place during the mid-2020s. So that's when we can really seriously begin moving the 6 metric tons to WIPP.

By comparison, the MOX approach, if we followed that, the first metric ton of plutonium would not be processed until the 2040s, and only if Congress can begin funding the project now at about $1 billion a year.

Senator ALEXANDER. Well, my time is up, but to summarize, you have testified that in your opinion and based on independent studies, that Congress might spend more than a half billion dollars more pursuing the MOX facility as opposed to Dilute and Dispose, so it's about half the cost or better. And, finally, you've said you could get all 13 tons that are now in South Carolina of plutonium, only 7 of which have anything to do with the Russian agreement, that you can get them out of South Carolina and into the WIPP facility much faster than you could using the current MOX procedure, and that under current authorities, you have permission—you wouldn't have to change the law in order to send those 13 tons to WIPP. Am I correct?

General KLOTZ. Yes, sir. That's all correct.

Senator ALEXANDER. Thank you.

And thanks to my colleagues for letting me go over a little bit.

Senator Feinstein.

Senator FEINSTEIN. Thank you, Mr. Chairman.

NUCLEAR CRUISE MISSILE

General Klotz, I recently met with Admiral Haney, the head of Strategic Command, regarding the new nuclear cruise missile and its refurbished warhead. I came away unconvinced of the need for this weapon. The so-called improvements to this weapon seem to be designed candidly to make it more usable, to help us fight and win a limited nuclear war. I find that a shocking concept. I think this is really unthinkable, especially when we hold conventional weapons superiority, which can meet adversaries' efforts to escalate a conflict. So maybe you can succeed where Admiral Haney did not.

Let me ask you this question, Why do we need a new nuclear cruise missile?

General KLOTZ. Well, thank you very much for the question, Senator, and let me just state at the outset, defining the—but I will answer your question—defining the military requirements is the responsibility of the Department of Defense, which obviously includes the Secretary of Defense, the Joint Chiefs of Staff, and the Commander of Strategic Command.

Senator FEINSTEIN. Don't bucket your view.

General KLOTZ. But we accept the responsibility for building the warhead that goes in it. But let me just say since when I was in uniform, I had command of Air Force Global Strike Command, and,

therefore, of the cruise missiles that the Air Force and the Department of Defense are proposing to replace. My sense at the time, and still is the case, is that the existing cruise missile, the air-launched cruise missile, is getting rather long in the tooth with the issues that are associated with an aging weapons system. It was first deployed in 1982, and, therefore, it is well past its service life.

In the meantime, as you know from your work on the Intelligence Committee, there has been an increase in the sophistication and capabilities, as well as proliferation, of sophisticated air missile defenses around the world. Therefore, the ability of the cruise missile to pose the deterrent—the capabilities necessary to deter is under question. Therefore, I think just based on the aging and the changing nature of the threat, we need to replace a system which we've had, again, for—since the early 1980s with an updated variant.

I guess I didn't convince you any more than Admiral Haney did.

Senator FEINSTEIN. I'm trying to figure out how to say it so that it's polite.

[Laughter.]

Senator FEINSTEIN. No, you didn't convince me because this just ratchets up warfare and ratchets up deaths, and, you know, even if you go to a low kiloton, 6 or 7, it's a huge weapon. And I thought there was a certain morality that we should have with respect to these weapons. And if it's really mutual deterrence, I don't see how this does anything other than it's like the drone. The drone has been invented. It's been armed. Now every country wants one. So they get more and more sophisticated. To do this with nuclear weapons I think is awful. And when I talked when I came here—now, I'm probably the only one here that was a child when those weapons went off, and as the chairman has heard me say before, I was in San Francisco, across the Pacific from where it happened, a small kid, it made a profound difference to me. You know, I remember jumping under the desks, I remember the exploding—Barry Goldwater's campaign of the daisy that exploded with one, and I saw bodies, I saw what happened to people.

I know a little bit about the sophistication of our weapons, not as much as you do, but I think there is a very definite morality in what we have. And I talk to people, well, the size is a deterrent. This is not a deterrent. All this means is that others will be doing the same thing. I don't want North Korea with a 6-kiloton nuclear cruise missile.

And somehow I think we lose our moral authority when we build new nuclear weapons. I don't see any way—you know, there's a certain moral code any way I can vote to support this, and I want you to know it. If you have anything you would like to say, I would love to hear it.

General KLOTZ. Well, first of all, Senator, I obviously respect your opinion, but I think on this, we have a fundamental disagreement. In my view, the moral approach is to develop a deterrent capability which poses the prospect to any potential adversary that they should never use nuclear weapons against the United States or those of our allies across the globe. We maintain the capability of having a deterrent by having systems which cannot be negated, defeated, nullified by any adversary, either by offensive attack or

by defensive capabilities that they may have. And so as we're faced with the prospect of potential adversaries having vastly improved conventional—vastly improved missile and air defenses, then we need to make sure that——

Senator FEINSTEIN. Do you admit, Admiral, that we have very big conventional weapons?

General KLOTZ. Yes, I do.

Senator FEINSTEIN. The biggest in the world?

General KLOTZ. And Air Force Global Strike Command, which I used to command, had responsibility for one of those.

Senator FEINSTEIN. Okay. Isn't that enough?

General KLOTZ. In a world armed with nuclear weapons, regrettably so, I think that in order to deter nuclear attack or the threat of nuclear attack against us or allies, we need a corresponding nuclear deterrent. That's my belief.

Senator FEINSTEIN. Okay. Well, let me go to—can I do one other question quickly?

Senator ALEXANDER. Sure.

Senator FEINSTEIN. What is the cost of the 3 to 1 hedge? Staff has tried to get those numbers, but have been unable to. I would like to ask that you provide it.

General KLOTZ. We will provide that.

[The information follows:]

The U.S. nuclear stockpile is made up of warheads in three categories—deployed warheads, logistics spares, and hedge. The deployed warheads are warheads located at operational bases, and must be fully maintained in a ready-to-use status at all times. Logistics spares are warheads retained (by DoD or DOE) to facilitate the logistics of warhead surveillance, maintenance, and refurbishment to ensure the required number of warheads in the other categories is maintained. Hedge warheads mitigate the risk of technical failure of any single weapon type or delivery system at a given time.

The number and type of warheads in the hedge depends on a number of factors, including the size and composition of the U.S. stockpile and the status of life extension efforts. Additional warheads of a type being refurbished may be retained temporarily (unrefurbished) as risk mitigation for a potential technical issue in the newly refurbished warheads.

By far the largest cost of maintaining this hedge is the cost of refurbishing the warheads that will be retained over the longer term as part of the hedge. Based on current life extension program (LEP) estimates and projections of the future size and composition of the stockpile (as reflected in the Nuclear Weapons Council's current Requirements Planning Document), over the next 25 years the cost of refurbishing warheads for inclusion in the hedge is approximately $3.5–$5.6 billion in fiscal year 2016 dollars (or 11–22 percent of the cost of LEPs for the warheads that would comprise the hedge at that time). Strategies that reduce the number of hedge warheads in future stockpile configurations (such as our current 3 + 2 strategy) will keep this refurbishment cost from rising above this level.

The cost, if any, for specific surveillance and assessment of the hedge would be small since the warheads in the hedge are the same as those being surveilled and assessed in the other stockpile categories.

Some small costs may associated with maintenance of hedge warheads when included in work scope associated with non-hedge counterparts, such as an alteration or modification. In this way they retain technical parity with warheads in other categories.

It is expected that the size of the hedge can be reduced as we implement a 3 + 2 strategy for the stockpile, with three ballistic missile warheads and two others, one for the LRSO and another for gravity bombs. This strategy will allow the U.S. to minimize the size of the stockpile, consistent with our commitments under the Nuclear Nonproliferation Treaty, while adequately hedging against technical risk.

Senator FEINSTEIN. Thank you very much.

Thanks, Mr. Chairman.

Senator ALEXANDER. Senator Graham, is your schedule such that I can go to Senator Udall since he's been here?

Senator GRAHAM. Absolutely. He can go first.

Senator ALEXANDER. All right.

Senator Udall, why don't you go ahead since you came early?

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

NATIONAL NUCLEAR SECURITY ADMINISTRATION BUDGET

Before we get into some of the details on the upcoming budget, I would like to step back and take a look at the overall funding picture. How does this budget compare to the NNSA's budget request in the year of the previous administration, fiscal year 2008? Where are we in terms of up, down, on that?

General KLOTZ. Well, I think a good round number for how much the overall NNSA budget has increased since then is about 40 percent.

Senator UDALL. 40 percent——

General KLOTZ. Maybe closer to 37 percent.

NUCLEAR WEAPONS STOCKPILE

Senator UDALL. Okay. And my understanding is that there is an incredible amount of scientific and technical work that needs to be done in future years as the stockpile ages and needs further work to keep it safe, secure, and reliable. Do you expect future NNSA budgets to need to increase further to continue to address the aging stockpile?

General KLOTZ. Yes, sir, we do. And in our budget submission for this year, we included our projections for the future years' nuclear security program out through the year fiscal year 2021, and it shows an increase in all of the budget lines each of those years except for 1 year for Naval Reactors.

And I will say right up front that there will probably be some additional costs which we will add there because one of the things we have done, and part of the management improvements, is to be much more rigorous about how we do analysis of alternatives, define mission requirements, and do independent cost reviews, and some of the things that are—we know we're going to have to pay for in the so-called outyears, we still have to baseline those and come in with the costs.

CMR FACILITY

Senator UDALL. Now, I would like to move on to the work to replace the aging CMR Facility at Los Alamos. The GAO report, which was released this month, highlighted the plutonium infrastructure strategy, and I'm quoting from them now, "Uncertain and possibly underestimated," and that, "This uncertainty is due to the fact that NNSA has not yet determined the number of additional modular buildings that may be required," at the Los Alamos Lab. Where are we on this issue? Where do you see this going at this point in terms of the demands that are on you from various agencies?

General KLOTZ. Well, thank you for that question. In fact, that is one of the lines in our future years' budget that will change as

time goes through. And, you know, I agree with the GAO's assessment, but one of the reasons why that's the case is the GAO has been very clear in reports over the past decade or so that the NNSA and the DOE need to do a better job in terms of defining requirements, holding to those requirements, doing analysis of—rigorous analysis of alternatives cost estimations. So we need to do that process with the modules. We are beginning the analysis of alternatives of how we create the additional space at Los Alamos that we need to carry out the congressional mandate to produce—or demonstrate a capability to produce war reserve plutonium pits in the years ahead. So until we have that and until we can baseline the cost of that, we won't know for certain what the costs are.

There's a tendency in Washington, both on the executive side and I would dare say on the congressional side as well, to ask for a number very, very early on in a project. I think until you have done that kind of analysis, any number you have is a guess. We would like to be more precise and more accurate in terms of providing what we think the costs will be.

Senator UDALL. And the budget includes funding for the initial design and development of a trusted strategic radiation hardened advanced microelectronics capability, which Sandia plays an important role supporting through the Trusted Foundry at the Microsystems and Engineering Science Applications, what's called the MESA Complex. Do you agree that the core competency on microsystems design at Sandia is an important national security asset?

General KLOTZ. Absolutely. And, in fact, our only facility for producing radiation hardened microelectronics that can operate in a nuclear environment is MESA, the Microsystems Engineering Science Applications at Sandia National Laboratory. It, too, is another facility which has been around for a while and is a little long in the tooth, but more importantly, the technology in this area continues to evolve. Sandia is still producing chips using 6-inch silicon wafers. Industry has already moved on to 8-inch and projected to go even further. So there are things we need to do to the facility to sustain it. There are things we need to do to the capabilities within MESA to make sure that we can continue to provide this vital capability.

Senator UDALL. Thank you very much, General.

I yield back, Mr. Chairman.

Senator ALEXANDER. Thanks, Senator Udall.

Senator Graham.

EXCESS PLUTONIUM DISPOSITION

Senator GRAHAM. Thank you, General. The agreement with the Russians covers how much plutonium?

General KLOTZ. 34 metric tons.

Senator GRAHAM. Where is the 34 metric tons located?

General KLOTZ. 7 of those metric tons are at Savannah River now. The remainder is primarily in storage at Pantex near Amarillo, Texas.

Senator GRAHAM. So when you talk to Senator Alexander about 13 tons at the Savannah River site, 6 of it was not covered by the agreement. Is that correct?

General KLOTZ. That's correct. Yes, sir.

Senator GRAHAM. So what are we going to do with the material in Texas?

General KLOTZ. The material in Texas would ultimately be slated for being turned into—being processed in a way that it could be diluted and then ultimately disposed of ——

Senator GRAHAM. Where is that going to be done at?

General KLOTZ. We expect it would be done in Savannah River.

Senator GRAHAM. Do you require any legal changes to get it to the WIPP program?

General KLOTZ. We do not require—we have statutory, sufficient statutory, authority to dispose of all 13 metric tons that are currently at Savannah River.

Senator GRAHAM. That's not my question. Does the statutory authority cover the 21 tons in Texas?

General KLOTZ. We expect that we would probably have to do some work on statutory authorities associated with that.

Senator GRAHAM. Do you expect probably maybe?

General KLOTZ. Probably.

Senator GRAHAM. No, absolutely you would.

General KLOTZ. Absolutely.

Senator GRAHAM. Good. Do you have any agreement with the Russians to change course?

General KLOTZ. We do not have an agreement with the Russians to change course, but, as you know, there is a provision within the agreement to—for the parties to——

Senator GRAHAM. Where are we at in that agreement?

General KLOTZ. As the Secretary has testified just a week ago——

Senator GRAHAM. So what do the Russians say?

General KLOTZ. The Russians are saying when you have a solid way forward—first of all, they have—the technical people I have talked with indicate an understanding of why we would want to do this and the technical aspects of it. Basically they've said——

Senator GRAHAM. So what do the Russians want in return?

General KLOTZ. Well, when they—when you are ready to go forward——

Senator GRAHAM. So let's see if I got this. We're going to change the entire program, then we're going to go to the Russians and see if they're okay with it? Is that the plan?

General KLOTZ. I—that is the——

Senator GRAHAM. That's the plan. That's a lousy plan. That is absolutely the dumbest friggin' plan I could think of, to change course and hope the Russians would agree and not know what they're going to charge you for it. Now, other than that, things are going great.

Now, in 2001, we made a decision about MOX, to reject the dual strategy. 2014, or 2010, I guess it was, we signed an agreement with the Russians that we're going to MOX out 34 metric tons. In 2016, we got a building, $5 billion worth, 90 percent, 70 percent complete, and we're going to stop and start all over again. Is that the plan?

General KLOTZ. Well, you know, we don't agree that it's 70, 80, 90 percent.

Senator GRAHAM. Well, you can come and look at the damn thing.

General KLOTZ. I have.

Senator GRAHAM. Okay. Is it big?

General KLOTZ. It is big.

Senator GRAHAM. Well, it cost $5 billion, I can promise you that. And I think it's 70 percent. What are we going to do with the building?

General KLOTZ. We would have to see what—what—if we——

Senator GRAHAM. Have you talked to anybody from New Mexico about their view of taking all this material?

General KLOTZ. As the Secretary told you last week, he has informally approached——

Senator GRAHAM. Well, have you——

General KLOTZ. Have I personally? I have talked——

Senator GRAHAM. Excuse me. We've informally talked to New Mexico. We now admit that you absolutely have to have a statutory change to cover the 21 metric tons. We're talking informally to the Russians. We're going to change the entire scope of the program and hope they agree with it. Is that pretty much where we're at? And we have no clue what we're going to do with this building.

Thank you.

Senator ALEXANDER. General Klotz, I've got some questions on another subject. This—the MOX subject is one that Senator Feinstein and I, Senator Graham, as well as Senator McCain and Senator Reed, are going to continue to address in the next few weeks.

INTERIM STORAGE OF USED NUCLEAR FUEL

Let me ask you and maybe Admiral Caldwell and maybe Ms. Harrington, the interim storage for used Navy fuel, building a new storage site for used fuel, but Admiral Klotz, that's temporary storage, right?

Admiral CALDWELL. Sir, I think that question is directed to me, sir.

Senator ALEXANDER. Okay, sir. That's temporary.

Admiral CALDWELL. The fuel that we're storing in Idaho is stored for interim——

Senator ALEXANDER. That means temporary.

Admiral CALDWELL. Yes, sir; it does.

Senator ALEXANDER. So you'll need somewhere to put it, an additional site. Would that fuel be eligible for Yucca Mountain?

Admiral CALDWELL. Yes, sir; it would be. The fuel we have out there today is packaged for interim storage, and it's packed in steel containers with concrete overpacks. Those steel containers are designed to last up to 10,000 years in the environment that we did the calculations for. And then the overpacks are designed to last at least 100 years.

Senator ALEXANDER. Yeah. But to reiterate, your site is a site for temporary storage.

Admiral CALDWELL. That's correct, sir.

Senator ALEXANDER. And it needs a permanent repository such as Yucca Mountain.

Admiral CALDWELL. That's absolutely correct, sir.

Senator ALEXANDER. Yeah. Senator Feinstein and I are working on as many paths as we can toward places for safe storage of used nuclear fuel.

General Klotz, you proposed work on a separate repository for defense waste separate from Yucca Mountain, they would only be able to accept waste from our defense sites, which doesn't include used fuel from commercial power reactors like the reactors that are closed in California with what we call stranded fuel. This would have to be built with funds that could be used for life extension programs or other infrastructure. Why would we build a separate repository for defense waste? Why wouldn't we just put all that stuff in Yucca Mountain?

General KLOTZ. Senator, I know the proposal, but to be perfectly honest, that is a project, a program, which resides elsewhere within the Department of Energy, not within NNSA. So I would have to get back to you on any specifics as far as——

Senator ALEXANDER. But if we spent money on a separate defense waste repository, it would have to come out of some of your funds——

General KLOTZ. It would depend on which—again, whether it's 050 money or not, and I just don't have the granularity of knowledge to respond to that.

LOW-ENRICHED URANIUM NAVAL CORES

Senator ALEXANDER. Let me ask one of you on a different question. You've done some good work on the last several years converting research reactor fuel from highly enriched uranium to low-enriched uranium, and you're down now I think to about six high-performance reactors that are still fueled with highly enriched uranium. Why don't you spend your time and money developing a way to have low-enriched fuel for the Navy vessels instead of worrying about the last six high-performance reactors?

Admiral CALDWELL. Sir, thanks for the question. Low-enriched uranium, from a military standpoint, there is no advantage to using that in a naval reactor plant. We use highly enriched uranium today, we've used it for decades, because it allows us to put the energy that we need to into a reactor core so that we can operate those ships for conceivably the life of the ship or for very long periods of time.

The reason why one might consider pursuing a low-enriched uranium naval core would be for the United States to be able to take a leadership role in development of low-enriched uranium and to be able to do that from a nonproliferation standpoint.

The other reason why one could consider it is because we need to sustain the workforce, the highly skilled workforce, that does this work for naval nuclear propulsion plants. That workforce is heavily taxed right now with the development of the *Ohio* replacement. Once that work tapers off, we're going to need some work to keep that workforce active and viable for future reactor plants.

So where we are today is we are continuing our work on highly enriched uranium. If I was to go to low-enriched uranium, it would require me to refuel ships more frequently than I do today. It would require us to take ships offline and remove them from the operational availability. To give you some example of that, we're

developing the *Ohio* Replacement to last for 42 years without refueling. A low-enriched uranium core would require at least one refueling. The Ford reactor plant for the new carrier is designed to have one refueling. A low-enriched uranium core might take two or more, at the cost of maybe $1 billion apiece. With the *Ohio* Replacement program, the fact that we don't refuel it saves the Nation $40 billion total ownership cost for that class of submarine.

So from a military standpoint, we want to have the ships operating more, we want to have—reduce the time that they're in the yards. If you use low-enriched uranium, we would have to deal with even more waste, we would have to deal with different types of waste, because the waste generated from low-enriched uranium is different from highly enriched uranium. And, additionally, the Navy might have to go purchase more ships to make up for the lost operational availability. So from a military standpoint, highly enriched uranium does what we need it to do.

Now, that all said, we were asked to develop a conceptual plan for developing a low-enriched uranium core for naval use. We have a draft report that's working its way through the Navy and through the Department of Energy; we're coordinating that. It lays out a program that would take 10 to 15 years at the cost of $1 billion to simply develop a low-enriched uranium core. Beyond that, it would take another 10 years to deploy that core, actually build it. So you're talking about technology that would take 25 years or so before it would come to fruition. Success could not be guaranteed, but if the conceptual plan lays out a plan to go look at that for consideration in a carrier plant, a larger plant, where you can put more fuel in it, probably not viable for a submarine plant, which is small.

So that conceptual plant is working its way through. Success could not be guaranteed. It costs a substantial amount of money. And if I was directed to go do that kind of work, I would need money above and beyond what I have today to support today's Navy.

Senator ALEXANDER. Thank you. I get the impression you think the idea of low-enriched uranium fuel for the Navy vessels isn't such a hot idea.

Admiral CALDWELL. I think there is some value in being able to sustain my workforce, so let me amplify that.

Senator ALEXANDER. Yeah, well, my time is about up, but I think that was a good complete answer——

Admiral CALDWELL. There is one aspect of this, though, sir. To go to low-enriched uranium, I have to develop an advanced fuel system. That advanced fuel system could have benefit for a low-enriched uranium core or a highly enriched uranium core. So there could be some benefit in going down the path to sustain my workforce and expand the technology that we have.

Senator ALEXANDER. Thank you, Admiral.

Senator Feinstein, I don't have any other questions, so I'll let you ask whatever you would like.

DEFERRED MAINTENANCE

Senator FEINSTEIN. I have one because I mentioned in my opening remarks that $3.2 billion in deferred maintenance of facilities,

a huge sum, I don't think I need to say that, actually. So, General Klotz, in your plans, to what extent is NNSA looking at alternative approaches for addressing the problem, such as reducing the number of facilities or consolidating functions?

General KLOTZ. Thank you very much. You're right, we have a very substantial backlog of deferred maintenance. Again, referring to my previous military career, I found that the first dollar usually goes to the pointy edge of the spear, or for the men and women who carry the spear, and then every year a decision is made to accept risk on facilities and infrastructures, and, you know, defer it one more year. Well, one more year becomes two more years, becomes 10 more years, and then ultimately you get to a tipping point in terms of our facilities, and I think that's where we are in NNSA and in other parts of the deal, in the laboratories that are out there with some facilities dating back to the Manhattan Project that you referred to earlier.

So Secretary Moniz laid down a—threw down the gauge a couple years ago and said that he wanted to arrest the halt in the growth of deferred maintenance for the Department of Energy as a whole, including NNSA. So with the fiscal year 2016 budget that thankfully you all enacted at the end of last year, we've essentially halted it at the 3 point I think 7, is what I would say, $3.7 billion level, and with 2017, we actually start to go down.

Now, we're exploring alternative ways of financing new facilities to get out of these old facilities that include using third-party financing. We have an enormous successful example of that in the Kansas City National Security Campus, which we reduced, got out of an old building that dated back to World War II, reduced our footprint from 3 million down to 1 million square feet. We've asked for money in this budget to demolish that particular facility.

So we're serious about looking for, whether it's a capital construction project or a third-party financing or an operating lease approach to do that, we're looking for new facilities to get our people in, and at the same time, to reduce the footprint and to demolish the buildings that are there now.

The one problem we do have with demolishing some of our buildings is if they are contaminated, we have to go through a very long tedious and expensive process of cleaning up the contamination before we can turn it over to that part of DOE that does the demolition.

Senator FEINSTEIN. Well, let me—what are your estimates? How—the $3.2 billion in deferred maintenance, did you have specific plans for meeting that, or are you just going to ignore it?

General KLOTZ. No, we have a specific plan, and we'd be happy to share that plan for you in terms of——

Senator FEINSTEIN. I would appreciate it.

General KLOTZ. Yes, ma'am. I'd be delighted to do it.

Senator FEINSTEIN. And your staff.

General KLOTZ. Yes, absolutely.

Senator FEINSTEIN. That would be just fine.

General KLOTZ. Yes, ma'am.

Senator FEINSTEIN. Thank you. That's it, I think, unless we want to debate a nuclear cruise missile more, which I don't think you do.

[Laughter.]

General KLOTZ. I'd love to come up and just sit down with you in your office and pursue that further.

Senator FEINSTEIN. Sure. I'd be happy to, actually.

Senator ALEXANDER. I might come watch.

[Laughter.]

General KLOTZ. I'll invite Admiral Haney to come over.

Senator ALEXANDER. It would be better than the Republican debates.

[Laughter.]

Senator ALEXANDER. Probably more informative.

Senator FEINSTEIN. I don't belittle people.

Senator ALEXANDER. No, no, no, you don't. I'm not getting into this with—I'm sorry—I'm sorry I even brought it up.

The hearing record will remain open for 10 days. Members may submit additional information or questions for the record within that time. The subcommittee requests all responses to questions for the record be provided within 30 days.

CONCLUSION OF HEARINGS

I want to thank General Klotz, Admiral Caldwell, Ms. Harrington, and General Davis, I want to thank all four of you for being here and thank you for the work you do for our country. We'll look forward to following up with you.

The committee will stand adjourned.

[Whereupon, at 3:35 p.m., Wednesday, March 16, the hearings were concluded, and the subcommittee was recessed, to reconvene subject to the call of the Chair.]

LIST OF WITNESSES, COMMUNICATIONS, AND PREPARED STATEMENTS

SUBJECT INDEX

DEPARTMENT OF ENERGY

NATIONAL NUCLEAR SECURITY ADMINISTRATION

OFFICE OF THE SECRETARY

NUCLEAR REGULATORY COMMISSION

U.S. ARMY CORPS OF ENGINEERS AND BUREAU OF RECLAMATION

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