ENERGY AND WATER DEVELOPMENT APPROPRIATIONS FOR FISCAL YEAR 2019

WEDNESDAY, APRIL 11, 2018

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

The subcommittee met at 2:30 p.m. in room SD–138, Dirksen Senate Office Building, Hon. Lamar Alexander, (chairman) presiding.

Present: Senators Alexander, Hoeven, Kennedy, Feinstein, Murray, Tester, Udall, Shaheen, and Merkley.

DEPARTMENT OF ENERGY

STATEMENT OF HON. RICK PERRY, SECRETARY

ACCOMPANIED BY:

HON. LISA E. GORDON-HAGERTY, UNDER SECRETARY FOR NUCLEAR SECURITY ADMINISTRATOR, NATIONAL NUCLEAR SECURITY ADMINISTRATION

HON. PAUL M. DABBAR, UNDER SECRETARY FOR SCIENCE

HON. JOHN VONGLIS, CHIEF FINANCIAL OFFICER

OPENING STATEMENT OF SENATOR LAMAR ALEXANDER

Senator ALEXANDER. Thank you for your patience. The subcommittee on Energy and Water Development will please come to order.

I brought with me the walking stick from Sam Houston. He left this stick in Nashville, Tennessee at the Hermitage when he brought his son to see Andrew Jackson as Jackson lay dying and Jackson died just before Houston arrived. Reason I brought it was because Houston grew up in Maryville, Tennessee and was trained in Tennessee as Governor before he became the Governor of Texas. And I always mention that to Secretary Perry, who is the longest-serving Governor of Texas ever, and I bring the stick with me in case we need it.

So, usually we don't. But it's a great privilege to work with Secretary Perry, who is off to a very quick start with his background in government and politics and coming from an energy State.

It's a privilege to continue to work with Senator Feinstein, who sometimes is chairman and sometimes is vice chairman of the subcommittee, but whether—it really doesn't make much difference because we take our differences of opinion and we find a way to work them out. And usually we are the first appropriations bill on the Senate floor and usually we pass our bill. And I hope that we will

be able to do that this year since we have, we already know the overall number of the budget. It ought to make it easier for us as a Senate to do it all.

Today's hearing will review the Administration's fiscal year 2019 budget request for the Department of Energy and the National Nuclear Security Administration, NNSA. This is the subcommittee's first budget hearing this year. We will have hearings on the Nuclear Regulatory Commission and the Corps of Engineers and the Bureau of Reclamation budget requests over the next 2 weeks.

In the past the subcommittee has had one hearing to examine the Department of Energy's budget request and a separate hearing to examine the NNSA budget request. This year, because of time constraints, we have combined both hearings into one. I appreciate the Secretary's flexibility in accommodating our hearing schedule this year.

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 arrive. Then we will turn to Secretary Perry for his testimony on behalf of both the Department and NNSA. And at the conclusion of Secretary Perry's testimony I'll recognize Senators for a five minute round of questions.

First, I'd like to thank the Secretary, as I just did, for being here and being responsive to us. I want to thank Senator Feinstein, whom I just did, for the privilege of working with her. She's a former mayor, she's result-oriented. I'm a former governor, so am I, and we try to get results.

Our witnesses today include Secretary Rick Perry, Secretary of Energy. Ms. Lisa Gordon-Hagerty, the Administrator of the National Nuclear Security Administration. The Secretary is also accompanied by Mr. Paul Dabbar, the Under Secretary of Energy for Science. And John Vonglis, the Chief Financial Officer at the Department of Energy.

I'm very pleased with the fiscal year 2018 energy and water appropriations bill, which provided $6.26 billion, record funding in appropriations bills, for the third consecutive year for the Office of Science which supports the Department of Energy's 17 national laboratories.

The bill also included $353 million for ARPA–E (Advanced Research Projects Agency—Energy) to continue the important research and development investments in high impact energy technologies, another record funding level. The bill also supported our national security programs providing $14.7 billion for the National Nuclear Security Administration, including record funding levels for our weapons program and naval reactors.

Now we are turning our—while I'm at it, I would like to say about that bill, there's been some discussion about the spending levels in the omnibus bill 2 weeks ago. I didn't like the process. I don't like the process when we do our work in the appropriations committee and then the full Senate doesn't have a chance to offer amendments on the floor.

The main problem is that Democratic Senators object to Republican Senators' amendments and then Republican Senators object to Democratic Senators' amendments. There's an old practice in the

Senate of actually voting on amendments, which would be a good practice we might try to introduce this year.

As far as the funding levels in the omnibus spending bill, it is true, in my opinion, that we have a very significant Federal debt problem, but you are shooting at the wrong target when you shoot at the appropriations spending.

The problem with the Federal debt is with the mandatory spending. The appropriations spending, which we approved 2 weeks ago, is a 2 year budget agreement that spends $296 billion over the next 2 years. According to the Congressional Budget Office report, that's about a 2.7 percent average growth rate, which is just a little above the inflation rate for the next 10 years.

Over the last 10 years the growth rate was a little below the inflation rate. So over that entire 20 years, the last 10 and the next 10, the growth of the 30 percent of the budget that is, that is discretionary spending, that's national defense, more than half of it, some of it reflected here in this hearing. National parks, national laboratories, national institutes of health, opioids, and disasters, all of that spending is growing about the rate of inflation. That's not the source of the Federal debt problem.

The source of the Federal debt problem, which neither party has been willing to address, is the entitlement programs which have gone up at this rate. The entitlement programs, according to the same Congressional Budget Office report that said that discretionary spending would go up 23 percent over the next 10 years, said that mandatory entitlement programs would go up nearly 100 percent over the next 10 years. Clearly an unsustainable, unsustainable level.

So I think it's important that when we are talking about Federal spending that we aim our shots at the right target. And we do have good funding levels for the Office of Science, for the Corps of Engineers, for a whole variety of programs under the jurisdiction of this committee, but they are funding levels that we should have and they are within the budget caps and they are at a rate of spending increase that's about the level of inflation and they are not the source of the Federal debt problem.

Now we are turning our attention to the Administration's 2019 budget request for the Department of Energy, a Federal agency with three critical missions; nuclear security, science and energy, and environmental management. We are here today to review the Department of Energy's budget request for that year, which begins October 1 and is approximately $30.6 billion, about 4.3 below what Congress provided in the fiscal year 2018, the year in which we are today.

The budget requests fifteen one—$15 billion for the National Nuclear Security Administration, which is $400 million more than the fiscal year 2018 enacted level. I'm also pleased to see the Department's 2019 budget request prioritizes supercomputing. That continues a several years of priority through the Obama Administration, through Senator Feinstein's chairmanship and my chairmanship of this committee.

We try to make sure that the United States is first or close to first in the world in computing. It includes approximately $672 million to deploy exascale systems in the early 2020s.

Unfortunately, the budget request this year proposes to decrease spending on federally funded research and development, terminates ARPA–E and recommends reduced funding levels below what Congress provided last year. $870 million less for the Office of Science. $1.6 billion less for the energy efficiency and renewal energy. $448 million less for nuclear energy.

So that's why we are holding this year, to give the Secretary an opportunity to discuss that, so Senator Feinstein and I, and other members of the committee, can make informed decisions as we write the energy and water appropriations bill over the next few weeks.

I'd like to focus my questions on three main areas. Support for science and energy research. Number two, safe and effective nuclear weapons stockpile. Number three, solving the nuclear waste dispute.

Research funding for the Department of Energy laboratories has produced technologies for unconventional natural gas development, supercomputing, 3–D printing, nuclear imaging devices used for medicine, MRI scanners, optical digital recording technologies, batteries and energy storage systems, precision detectors, and pharmaceuticals.

It's hard to think of a major technological advance since World War II that hasn't had some sort of Federal research support. That's made us a world leader in science and technology. It's one important reason why the United States produces nearly one out of every four dollars in wealth produced in the world.

A key pillar of our national defense is a strong nuclear deterrent. In February, the Administration issued an updated nuclear policy, the Nuclear Posture Review. It recommends continuing many things we worked on for several years. Things that I support, including continuing life extension programs, continuing to invest in facilities to maintain our weapons stockpile, including the Uranium Processing Facility and the plutonium facility.

I'm pleased to know the department approved the design of the nuclear buildings for the uranium facility last month which allows the contractor to begin construction. Senator Feinstein and I have worked for several years to try to bring that facility on time and on budget and we believe that we have.

The Nuclear Posture Review, which calls for two low-yield warheads to be added to the stockpile, I'd like to hear more about that today.

Then there's the nuclear waste stalemate. We need to solve this problem. This has been a priority, especially of Senator Feinstein, but with my equally strong support over the last several years. I compliment her for her leadership. She has been especially sensitive to California's needs in this respect, as well as to the Country's.

This year's budget request for the Department of Energy includes a $110 million to restart Yucca Mountain and $10 million to study ways to open an interim storage site or use a private interim storage site. I believe Yucca should be a part of the solution to the nuclear waste stalemate. Federal law designates Yucca Mountain as the Nation's repository for used fuel and the commission's own sci-

entists have told us that we can safely store nuclear waste there for up to one million years.

But even if Yucca Mountain were open today we would still need to look for another permanent repository. We have more than enough used fuel to fill Yucca Mountain to its legal capacity. So Senator Feinstein and I, along with the leaders of the Committee of Energy, Murkowski and Bingaman and Wyden and Cantwell, have had a bill to implement the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future, which we are working to reintroduce this year.

This legislation compliments Yucca Mountain. It would create a new Federal agency to find additional permanent repositories and temporary facilities. But the quickest and probably least expensive way for the Federal Government to start to meet its used nuclear fuel obligations is for the Department of Energy to contract with a private storage facility for used nuclear fuel.

Last year the Secretary told the subcommittee that the Department of Energy has the authority to take title to used nuclear fuel, but you were hesitant, Mr. Secretary, to agree it has the authority to store the used fuel in a private facility without more direction from Congress. I understand that two private companies have submitted applications to the Nuclear Regulatory Commission for consolidated storage facilities. One in Texas, one in New Mexico. I'll be asking some questions about that.

So, Mr. Secretary, I look forward to working with you, and Administrator Gordon-Hagerty, as we begin putting together our energy and water appropriations bills. I will need the Secretary's assurance that the Department will continue to fund projects consistent with Congressional intent in the 2018 omnibus appropriations bill. And we would also like to hear your priorities for the 2019 bill, which will reflect funding levels much like the 2018 bill and will provide the department with more, not less money than the budget request.

[The statement follows:]

PREPARED STATEMENT OF SENATOR LAMAR ALEXANDER

First, I would like to thank Secretary Perry for being here today. This is Secretary Perry's second year before the subcommittee.

I also want to thank Senator Feinstein, with whom I have the pleasure to work again this year to draft the Energy and Water Appropriations bill.

Our witnesses today include: Secretary Rick Perry, the Secretary of Energy; and Ms. Lisa Gordon-Hagerty, the Administrator of the National Nuclear Security Administration.

The Secretary is also accompanied by Mr. Paul Dabbar, the Undersecretary of Energy for Science and John Vonglis, the Chief Financial Officer at the Department of Energy.

I am very pleased with the fiscal year 2018 Energy and Water Appropriations bill, which provided $6.26 billion, record funding in a regular appropriations bill for the 3rd consecutive year, for the Office of Science, which supports the Department of Energy's 17 national laboratories.

The 2018 bill included $353 million for ARPA–E, to continue the important research and development investments into high-impact energy technologies—another record funding level in a regular appropriations bill.

The 2018 bill also supported our national security programs, providing $14.7 billion for the National Nuclear Security Administration, including record funding levels for our Weapons Program and Naval Reactors.

Now we are turning our attention to the administration's fiscal year 2019 budget request for the Department of Energy, a Federal agency with three critical missions: nuclear security, science and energy, and environmental management.

We're here today to review the Department of Energy's budget request for fiscal year 2019, which begins on October 1st of this year, and is approximately $30.6 billion dollars. This amount is about $4.3 billion below what Congress provided in the fiscal year 2018 Energy and Water Appropriations bill for the Department.

The budget requests $15.1 billion for the National Nuclear Security Administration, which is $400 million more than the fiscal year 2018 enacted level.

I'm also pleased to see that the Department's 2019 budget request prioritizes supercomputing, and includes approximately $672 million to deploy exascale systems in the early 2020's.

Unfortunately the budget request this year again proposes to decrease spending on federally funded research and development, terminates ARPA–E, and recommends reducing funding levels below what Congress provided last year: the Office of Science by $870 million; Energy Efficiency and Renewable Energy by $1.6 billion; Nuclear Energy by $448 million; and Office of Electricity by $91 million.

And that is why we are holding this hearing: to give Secretary Perry an opportunity to discuss the Department's priorities, so Senator Feinstein and I can make informed decisions as we begin to write the fiscal year 2019 Energy and Water Appropriations bill over the next few weeks.

Governing is about setting priorities, and we always have to make some hard decisions to ensure the highest priorities are funded.

Today, I'd like to focus my questions on three main areas, all with an eye toward setting priorities: prioritizing Federal support for science and energy research; maintaining a safe and effective nuclear weapons stockpile; and solving the nuclear waste stalemate.

Research funding for Department of Energy laboratories has produced technologies for unconventional natural gas development, supercomputing, 3D printing, nuclear imaging devices used for medical diagnosis, MRI scanners, optical digital recording technology used to make DVDs, batteries and energy storage systems for cars and trucks and the electric grid, precision detectors, and pharmaceuticals.

The Department of Energy's research programs have made the United States a world leader in science and technology, and these programs will help the United States maintain its brainpower advantage to remain competitive at a time when other countries are investing heavily in research.

The Federal budget cannot be balanced by cutting discretionary spending, which is only 30 percent of Federal spending.

Mandatory spending, which amounts to more than 63 percent of Federal spending, is the cause of the more than $21 trillion Federal debt.

The Federal debt is not the result of Congress overspending on science and energy research each year.

A key pillar of our national defense is a strong nuclear deterrent. In February, the administration issued an updated nuclear policy, called the Nuclear Posture Review.

The updated Nuclear Posture Review recommends continuing many of the things we have been working on for the last several years—things that I support, including continuing Life Extension Programs to make sure our current nuclear weapons remain safe and effective, continuing to invest in the facilities we need to maintain our nuclear weapons stockpile. This includes the Uranium Processing Facility and the Plutonium Facility.

I'm pleased to know the Department approved the design of the nuclear buildings for the Uranium Processing Facility last month, which allows the contractor to begin construction, and I'll be asking some questions about that project today.

The Nuclear Posture Review also calls for two low yield warheads to be added to the stockpile, largely in response to capabilities being developed by Russia and other countries.

I'd like to hear more about that today, and look forward to hearing the reasons the administration determined these warheads are needed for our national defense.

To ensure that nuclear power has a strong future in this country, we must solve the decades' long stalemate over what to do with used fuel from our nuclear reactors.

Senator Feinstein and I have been working on this problem for years, and I'd like to take the opportunity to compliment Senator Feinstein on her leadership and her insistence that we find a solution to this problem.

To solve the stalemate, we need to find places to build geologic repositories and temporary storage facilities so the Federal Government can finally meet its legal obligation to dispose of nuclear waste safely and permanently.

This year's budget request for the Department of Energy includes $110 million to restart work for Yucca Mountain repository and $10 million to study ways to open an interim storage site or use a private interim storage site.

I strongly believe that Yucca Mountain can and should be part of the solution to the nuclear waste stalemate. 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 one million years.

But even if we had Yucca Mountain open today, we would still need to look for another permanent repository. We have more than enough used fuel to fill Yucca Mountain to its legal capacity.

So Senator Feinstein and I, along with the leaders of the Committee on Energy and Natural Resources, Senator Murkowski and then Senators Bingaman, Wyden, and now Senator Cantwell, have a bill to implement the recommendations of the President's Blue Ribbon Commission on America's Nuclear Future, which we're working to reintroduce this year.

The legislation complements Yucca Mountain, and would create a new Federal agency to find additional permanent repositories and temporary facilities for used nuclear fuel.

But the quickest, and probably the least expensive, way for the Federal Government to start to meet its used nuclear fuel obligations is for the Department of Energy to contract with a private storage facility for used nuclear fuel.

Last year, you told this subcommittee that the Department of Energy has the authority to take title to used nuclear fuel, but you were hesitant to agree that it has the authority to store the used fuel at a private facility without more direction from Congress.

I understand that two private companies have submitted applications to the NRC for consolidated storage facilities, one in Texas and one in New Mexico. I'll be asking some questions about this today.

I look forward to working with Secretary Perry and Administrator Gordon-Hagerty as we begin putting together our Energy and Water Appropriations bill for fiscal year 2019.

I will need the Secretary's assurance that the Department will continue to fund projects consistent with congressional intent in the fiscal year 2018 Omnibus Appropriations bill.

I would also like to hear what Secretary Perry's priorities are for an fiscal year 2019 Energy and Water Appropriations bill, which will reflect funding levels much like the fiscal year 2018 bill, and will provide the Department more, not less money, than the budget requests.

Senator ALEXANDER. I will now recognize Senator Feinstein.

STATEMENT OF SENATOR DIANNE FEINSTEIN

Senator FEINSTEIN. Thank you very much, Mr. Chairman. And I thank you for your remarks about me. I would double them with respect to you.

I've said for many years now that one of the great treats of my Senate service has been the ability to work with you and to listen to big problems and we have done a lot of that. The new Secretary has become a part of that problem-solving.

Some of them are very difficult to solve, but you've always been constructive, you've always been forward-looking, and you've always been reasonable. And I can't say that for everyone. So thank you very much.

Mr. Secretary, I want to welcome you. I look forward to your statement. So far, what I can see, you've been strong and ready and able. And so that's delightful.

Madam Administrator, I have had the opportunity to have a meeting with you, which I very much enjoyed, and look forward to working with you particularly on matters of mutual concern.

And Mr. Dabbar, I would say the same for you as well. So thank you very much.

Mr. Chairman, you were very nice in your remarks about the cuts in this budget. But this budget, in parts, is just cut, cut, cut. The Administration proposes to cut energy efficiency programs by

70 percent. It proposes to cut electricity delivery and energy reliability programs by 75 percent. It proposes to cut scientific research programs by 14 percent and it proposes to entirely eliminate ARPA–E. It even proposes to cut the peaceful nuclear energy programs I know you care so much about by 37 percent.

So I am really deeply disappointed in this part of the budget that it fails to adhere to the spending cap agreement that this Administration has just supported. Instead, it proposes to cut $3.9 billion from nondefense programs while increasing defense funding for the National Nuclear Security Administration. That's not the kind of parity between defense and nondefense that Congress just agreed to and that the President signed into law.

Speaking of ever-increasing defense spending at the expense of everything else, let me say a few words about the Administration's Nuclear Posture Review. In 2010, as part of the New START Treaty negotiations in the Senate, Chairman Alexander and I agreed to a straight-forward deal. We would fund the modernization of our nuclear arsenal in exchange for an overall reduction in the number of deployed nuclear warheads—nuclear weapons and the specific elimination of the B83 warhead.

In keeping with that agreement, the Obama Administration requested $85 billion over 10 years for warhead life extension programs, facility upgrades and scientific research activities.

By the end of this year, Mr. Chairman, this subcommittee, both under your leadership and mine, has kept our word and appropriated 98 percent of the funds requested, a total of $65.6 billion. The only reason it's not a hundred percent is because of the imposition of sequestration in 2013.

With the President's 2019 and projected 2020 request the total will reach nearly $89 billion. So we have more than held up our end of the bargain. However, the Trump Administration's Nuclear Posture Review jeopardizes the Executive Branch's end of the bargain by proposing new nuclear weapons and other unnecessary and costly changes to our nuclear arsenal.

I'd like to mention just two of the most egregious examples. First, the Nuclear Posture Review proposes to retain the B83–1 and the B61–11 nuclear gravity bombs, which were supposed to be retired in the 2020s. The exact size is classified, which makes for an uninformed discussion. But I can say that the B83 is the largest warhead in America's arsenal. It is capable of not only wrecking mass destruction and human misery on any target country, but it would also create devastating problems for innocent neighboring countries.

Times have changed since World War II. The world is more interconnected and knowledgeable about nuclear weapons and I simply don't believe the American people would ever sanction the use of such a massive weapon capable of such devastating destruction.

In 2013, this subcommittee agreed to the modernization of the B61 family of bombs in exchange for the retirement of the B83 in the mid 2020s. The ongoing B61 modernization program replaces aging components. But, most importantly, it consolidates five current variants of the B61 into a single model and reduces the overall

number of warheads. At the time, I expressed concerns about the cost and management of the B61 Life Extension Program.

In 2013, I wrote to President Obama saying "I am concerned that the NNSA proposed B61 Life Extension Programs are unaffordable and the proposed scope of work is not the lowest cost option that meets military requirements."

Now, despite my reservations, I relented because I understood that the B61 Life Extension Program would lead to a reduction in the overall number of nuclear weapons and the eventual retirement of the B83 gravity bomb, which was my original goal.

I have a letter here from former Defense Secretary Hagel and former Energy Secretary Moniz from 2013. They wrote that the B61 Life Extension Program "would allow us to pursue retirement of the B61–11 and the B83 gravity bomb."

I'd ask that that letter be included in the record.

Senator ALEXANDER. It will be.

[The information follows:]

November 6, 2013

The Honorable Dianne Feinstein
Chairwoman
Subcommittee on Energy
and Water Development
Senate Committee on Appropriations
United States Senate
Washington, DC 20515

Dear Madam Chairwoman:

We are writing to urge congressional support for the B61-12 Life Extension Program (LEP) and guided Tailkit Assembly in line with the President's budget request for FY 2014. These programs are critical to modernizing the nuclear gravity weapon stockpile while ensuring we sustain our strategic and non-strategic air-delivered nuclear deterrent capability. Additionally, the B61-12 LEP is an integral part of the strategy to realizing the President's nuclear security objective of maintaining a safe, secure, and effective nuclear deterrent while reducing the number and role of nuclear weapons in our employment strategy. Following your recent meeting with Ms. Liz Sherwood-Randall of the National Security Staff, you expressed potential support for this LEP if it would lead to a reduction in the number of deployed and non-deployed nuclear weapons and eventual retirement of the B83 gravity bomb. We are submitting this letter to assure you that the B61-12 will achieve both of these objectives.

The B61-12 LEP with guided Tailkit Assembly will replace four of the five current variants of the B61, resulting in a single variant after the B61-11 is retired. Having a single B61 variant will enable a reduction in the number of deployed and non-deployed air-delivered nuclear gravity weapons in the stockpile, while increasing the safety and security of this aging system. Additionally, by balancing reduced yield with improved accuracy, this LEP would allow us to pursue retirement of the B61-11, and the B83 gravity bomb, once confidence in the B61-12 stockpile is gained; as provided in the FY 2014 National Nuclear Security Administration Stockpile Stewardship and Management Plan.

Even in these times of reduced budgets, we believe the investments required to achieve these plans are needed to fulfill the President's nuclear vision. Both Departments are committed to the program and through studies of alternative options, believe the B61-12 LEP is the most cost effective option that meets military requirements and policy objectives. Maintaining the commitment to the necessary investments in this program and its capability is critical to the Administration's nuclear security objectives, and we look forward to the full support of Congress.

Sincerely,

Chuck Hagel
Secretary of Defense

Ernest J. Moniz
Secretary of Energy

DEPARTMENT OF DEFENSE
AND
DEPARTMENT OF ENERGY
NUCLEAR WEAPONS COUNCIL
WASHINGTON, DC 20301-3050

National Nuclear Security Administration

JAN 14 2014

The Honorable Dianne Feinstein
Chairman
Subcommittee on Energy
and Water Development
Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Madam Chairman:

In a dual-signed letter dated November 6, 2013, Secretary of Defense Chuck Hagel and Secretary of Energy Ernest J. Moniz urged congressional support for the B61-12 Life Extension Program and guided Tailkit Assembly. In the letter, the Secretaries noted that the B61-12 Life Extension Program would lead to a reduction in the number of deployed and non-deployed air-delivered nuclear gravity weapons in the stockpile, as well as the retirement of the B83-1 gravity bomb.

I am writing to inform you that the Nuclear Weapons Council (NWC) supports the plan for the retirement of the B83-1 gravity bomb contingent upon the completion of a B61-12 Life Extension Program that meets the military requirements. Fielding the B61-12 enables the retirement of the B83-1 bomb in the mid- to late 2020s.

Ensuring a safe, secure, and effective nuclear deterrent remains the NWC's highest priority. We look forward to the full support of Congress in our efforts to achieve the Administration's objectives.

Sincerely,

Frank Kendall
Chairman

Senator FEINSTEIN. Thank you.

And Frank Kendall, then Chairman of the Nuclear Weapons Council wrote to me in 2014 that "fielding the B61–12 enables the retirement of the B83–1 bomb in mid to late 2020s."

And I ask consent to add that letter to the record too. And also my recent letter to Secretary Perry and Secretary Mattis in the record.

[The information follows:]

DIANNE FEINSTEIN
CALIFORNIA

COMMITTEE ON THE JUDICIARY - RANKING MEMBER
SELECT COMMITTEE ON INTELLIGENCE
COMMITTEE ON APPROPRIATIONS
COMMITTEE ON RULES AND ADMINISTRATION

United States Senate

April 9, 2018

The Honorable James Mattis
Secretary
U.S. Department of Defense
1000 Defense Pentagon
Washington, D.C. 20301

The Honorable Rick Perry
Secretary
U.S. Department of Energy
1000 Independence Ave, SW
Washington, D.C. 20585

Dear Secretary Mattis and Secretary Perry,

I write today in strong opposition to the Defense and Energy Departments' request to retain the B83 gravity bomb in our nuclear arsenal. Not only is retaining this weapon unjustified, but it is in direct contravention to an agreement the Energy and Water Appropriations Subcommittee made with the prior administration. I strongly urge you to phase out the B83-1 by 2025, as expected.

First, without any prior consultation with the Appropriations Committee, the Nuclear Posture Review stated that the administration intends to retain the B83 "until a suitable replacement is identified." The NPR failed to identify why retaining the B83-1 was necessary, either by citing a change in military requirements or questioning the availability of the B61-12 after 2020. Further, neither the NPR, nor the Energy Department's FY19 budget request, nor the Fiscal Year 2018 Stockpile Stewardship Management Plan detail how retaining the B83 will fit into planned agency budgets and work scopes, or provide a revised justification for the B61-12 life extension program (LEP).

Second, retaining the B83 is in direct contravention to an agreement the Energy and Water Appropriations Subcommittee made with the prior administration. In August 2013, I expressed concerns about the cost, scope, and management of the then-proposed plan to consolidate the variants and extend the life of the B61 nuclear gravity bomb.

After extensive discussion with the Obama Administration—as Chairman of the Energy and Water Appropriations Subcommittee—I agreed to the LEP for the B61-12 gravity bomb if it would lead to a reduction in the number of deployed and non-deployed nuclear weapons and the eventual retirement of the B83 gravity bomb.

As a result, in November 2013, Secretary of Defense Hagel and Secretary of Energy Moniz wrote to me:

> "[B]y balancing reduced yield with improved accuracy, this LEP would allow us to pursue retirement of the B61-11, and the B83 gravity bomb, once confidence in the B61-12 is gained…"

WASHINGTON, DC 20510-0504
http://feinstein.senate.gov

Further, in January 2014, Frank Kendall, then head of the Nuclear Weapons Council wrote to me that "Fielding the B61-12 enables the retirement of the B83-1 bomb in the mid- to late 2020s."

The B61-12 will begin production 2020 and is scheduled to be complete by 2025. Within this timeframe, it has been expected that sufficient confidence will be gained in B61-12 performance that the B83 can be phased out.

Finally, I strongly believe that the United States no longer needs a megaton-class weapon. As you know well, the B83-1 is the last megaton-class warhead in the U.S. nuclear stockpile, and it is capable of delivering death and destruction on a scale many hundreds of times greater than the bombs that we dropped on Nagasaki and Hiroshima. This weapon is a "city killer," whose only purpose is to destroy civilian populations, either directly or through giant plumes of dust, debris, and radioactive fallout.

I strongly oppose retaining the B83-1 and B61-11 weapons. Doing so is contradictory to the original justification of the B61-12 LEP and is unaccompanied by the careful cost and planning analyses required for Congressional justification. I urge you to reverse course so that we can work together to ensure the United States has a safe, secure and reliable nuclear deterrent.

Sincerely,

Dianne Feinstein
United States Senator

Senator FEINSTEIN. Thank you.

Mr. Chairman, we had a deal. We agreed to modernize the B61 in exchange for retiring the B83 and reducing the total number of nuclear warheads in the arsenal. Now the Trump Administration is reneging on that deal and they aren't even providing any justification at all for retaining this huge warhead, the B83.

Why should this subcommittee agree to fund the B61 life extension at all if this Administration is just going to retain the B61, B83 anyway?

Mr. Chairman, as I said in my letter to you this week, I'd like to work with you in drafting an energy and water appropriations bill that adheres to our agreement and keeps in place the plan to retire the B83. If we can get rid of this gigantic, terrible weapon while ensuring our ongoing national security, I feel we will have done something good for the American people and for the world.

And let me say this, Mr. Chairman, this is extremely important to me. I'm one of the few people in this room that was old enough to remember our dropping the bombs on Hiroshima and Nagasaki. I was in California in San Francisco, a little girl. I remember reading the San Francisco Chronicle with horrible pictures, people running and skin falling off their back. And it's followed me my whole life and what I want to do is bring some sanity to the issue.

The size of these bombs, all of which is classified, so we can't go out and tell people how big or how small they are. And this is very frustrating because the average public doesn't know. We can't talk about 3 to 1 in the hedge. And it's not necessary to have 3 to 1 in the hedge. So I want to tell both you and the Secretary, I will not support the energy and water bill now or in the future that violates our agreement and retains the B83. The second egregious fail-

ing of this Administration's Nuclear Posture Review is the proposal for a low yield variant of our submarine launched ballistic missile. This comes at the eleventh hour of efforts to modernize our sub launched missile force. And we already have low-yield options in our nuclear arsenal that are already undergoing modernization. Why are those insufficient?

I hope somebody can answer that question. I see a naval uniform with a lot of stripes on the sleeve.

Mr. Chairman, I understand each Administration sets its own goals and policies. And that's fine. But Congress is also a co-equal branch that should have its own independent priorities and this subcommittee should not simply take this latest Nuclear Posture Review as gospel.

For the last 8 years now there has been a bipartisan consensus in Congress for maintaining and modernizing our nuclear arsenal. And this Chairman and I have worked together to do so. And I think we have achieved comity, we have achieved agreement. We have been getting the job done, we have been getting the funds funded.

If the Trump Administration wants to throw out the current agreement with Congress then let's discuss it all and question everything. All the new and expensive facilities, every warhead, every science project, let's have a real debate about what's really necessary to defend this country and leave the world safer for future generations than we found it.

I'd like to finish with just one more example of the inability to stick to prior agreements. It's been widely reported in the press that this Administration is considering submitting a rescission package to Congress that would undo parts of the recently passed 2018 spending bill, the parts that the President doesn't like.

The 2018 spending bill contained things we all liked and did not like and that's what happens in a negotiation. A deal is a deal. Trying to undo the deal after the fact is really the height of bad faith and it would poison the appropriations process and imperil our ability to work together to ensure our shared priorities are funded in 2019.

Mr. Secretary, welcome to the heat. I hope you are here today to tell me that I'm wrong about the Administration's intentions and that you are ready to work with this committee to robustly fund the important mission of the Department of Energy. I hope you're here to tell us that you will leave your department, our country and our world better off than you found it when you entered this present office.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Feinstein.

We will now see if Senator Shaheen, Senator Merkley would like to make any comments before we hear the Secretary.

Senator SHAHEEN. I will wait until my questioning time. Thank you, Mr. Chairman.

Senator ALEXANDER. Senator Merkley.

Well, thank you both for being here.

Mr. Secretary, if you could summarize it in about 7 minutes or so that will leave us more time to go back and forth.

Secretary PERRY. I'll try to leave you more time than that, sir.

Senator ALEXANDER. Welcome.

SUMMARY STATEMENT OF HON. RICK PERRY

Secretary PERRY. Let me just say how refreshing it is for me to have two people on different sides of the aisle, but have such great admiration for each other and been working. I've been watching you for a lot longer than when I was privileged to be the Secretary and I appreciate you both greatly. Working with both of your staffs, and you, has been a great privilege and I thank you for that. And so let me just say it's a privilege and an honor for me to get to sit here in front of you as the 14th Secretary of Energy.

I'm proud to be joined today and, quickly, Lisa is relatively new to come on board, but she's not new to the business at all. I'm really proud to have her as a colleague and be working together. She's headed up the nuclear security side of things and Lisa Gordon-Hagerty.

And Paul Dabbar down on the other end. At one time a young, not that you're getting any—not that you're old, Dabbar, but a young, bright Naval Academy grad who now finds himself in the Office of Science and Under Secretary of Science. And Paul, thank you.

John, thanks for your standing here to my left as well. Thank the members of the committee for each of you.

Mr. Chairman, you mentioned this, but thank you for your flexibility in allowing us all to come here and be here together. That was very much of a help to us.

This budget represents a request to the American people, through their representatives in Congress, to fund the priorities of this department and it underscores the DOE's (Department of Energy) commitment to stewardship, accountability, service. I hope that our interactions with you and other committees of Congress over the past year have underscored that commitment.

Our DOE leadership team has appeared before Congress now 23 times in 2017 and we are proud of the strong relationship that has been built with Congress. This is my fifth hearing in 2018 and I am very proud of our standard of transparency.

When I first appeared before this committee last year, I committed DOE to advancing several key objectives. I noted at that time that we needed to modernize our nuclear weapons arsenal, continue addressing the environmental legacy in many of your States and further advance domestic energy production, better protect our energy infrastructure and accelerate our Exascale computing capacity. The fiscal year 2019, $30.6 billion budget request for the Department, seeks to advance these and other goals.

Mr. Chairman, plain and simple, the United States Government has no greater or more solemn duty than to protect its citizens. The geopolitical environment has changed and it's changed significantly since the 2010 Nuclear Posture Review.

Because nuclear deterrents is critical to our defense last year we promised a much needed upgrading of our arsenal. This year we have requested an 8.3 percent increase for that purpose and to align ourselves with the President's Nuclear Posture Review and the Nuclear Security Strategy.

The current Nuclear Posture Review supports and improves our deterrent policy and existing capabilities to counter nuclear threats.

We are also focusing on addressing the environmental legacy left at the Department site which produced the materials that helped us into world war and secure the peace. Last year we promised to focus on that obligation and this year we are requesting additional funds to do so. We also have a duty to advance a fundamental mission of our Department and that is energy independence for our country.

And thanks to American ingenuity and innovation we are on the cusp of realizing that mission objective for the first time since the old shortages of the 1970s. In the coming years we are producing an abundance of energy from a diverse number of sources. Not only are we becoming energy independent, we are also exporting to our friends and our allies and our partners as well.

Just last year we became a net exporter of natural gas. Today we are exporting LNG (liquefied natural gas) to 27 countries on five continents. The Energy Information Administration reports that the U.S. LNG exports quadrupled from 2016 to 2017. But, in addition to this progress, something else has happened. Our environment has become better. Even as our economy expanded and energy development reached new heights from 2005 to 2017 we lead the world in reducing carbon emissions cutting them by 14 percent over that period of time. And as I speak, we continue our world-leading performance in this arena.

The lesson is clear, we don't have to choose between growing our economy and caring for our environment. By embracing innovation we can benefit both. That's the heart of the new energy realism doctrine that I recently described.

To drive further energy innovations we are requesting continued funding of our energy program offices as well as more funding for research in fossil fuels and nuclear power including advanced modular reactors.

Now, if we have a duty to advance domestic energy production, we also have a duty to ensure that our energy actually gets delivered without interruption. My great focus as the Secretary of Energy is to ensure that our grid is not only reliable, but that it's also resilient. That's why last year I promised to step up our efforts to protect and maintain America's energy infrastructure in the face of all hazards.

The devastation caused by the 2017 hurricanes and the impacts of the electricity sector highlighted the importance of improving grid reliability and resilience in the face of natural disasters, but we also must protect our energy sector from man-made attacks, including cyber attacks. So this year we have requested funding increases to strengthen cyber security as well as the Department's cyber defenses. We are establishing a new office of cyber security, energy security, emergency response, which will be lead by a new assistant secretary. We must also ensure that when these threats materialize, we have a full diversity of fuels to keep our electric grid running. Our energy security, our national security depends on a diversity of fuel sources that can produce electricity when Americans want it and where they need it.

Technology will help us solve these challenges since much of our Nation's greatest technology breakthroughs affecting energy have come through our national labs. We need to ensure their continued ability to innovate. Fiscal year 2017, our national labs won 33 of the prestigious R&D (research and development) 100 Awards, including technologies regarding new materials, protecting our environment, incorporating renewable energy, reliability on the electric grid and sophisticated cyber security tools.

These accomplishments, meaning the people driving our innovation agenda and imploring them to reach even higher are some of the reasons I've committed to visit each of our national labs. I'm especially proud of the work that several of our labs, including Oak Ridge, are doing to harness the power of their world class supercomputers to increase our ability to provide precision medicine. Senator, I mentioned that to you as we walked in earlier, needed to improve the health of our veterans, our first responders, athletes, moms whose daughter play soccer for instance, who have had concussions that this committee is well aware of the value of our national labs and the promise they bring to our Nation's future.

I want to thank you and your colleagues for the leadership and commitment to advancing science.

And finally, let me touch on one of our other key objectives laid out last year and that is to accelerate efforts to develop Exascale computing systems. This year we requested nearly a 25 percent increase for this vital area in order to keep the United States at the forefront of supercomputing.

We recently announced a major RFP (Request for Proposal) to begin the second phase of our efforts to regain leadership in supercomputing. The machines that we will build and deploy will be 50 to 100 times faster than any of our current supercomputers. They will be housed at Oregon, Oak Ridge and Lawrence Livermore National labs. They hold immense potential to help us answer the most vexing questions in science, medicine and national security.

Chairman Alexander, in my first year I've gotten to see the depth and the breadth of the DOE enterprise and I could not be prouder to lead these men and women. I visited 13 of the 17 national labs, including, Senator Feinstein, as I shared with you last week, all four of those in the Bay area. I visited WIPP (Waste Isolation Pilot Plant), matter of national security site, Pentax, Y–12, the Kansas City National Security Complex, McNary Dam, and of course, Hanford.

At each site one thing is made abundantly clear to me in that those who work for the Department of Energy are dedicated, they are patriotic and they are committed to serving the American people.

In the end, it's you, the People's elected representatives, who will decide how to best allocate the resources of our hard-working taxpayers. My commitment to you is that we will do our best to use those resources wisely and in the pursuit of the vital goals that I've outlined.

Thank you, Mr. Chairman. I'll be happy to attempt to answer any questions.

Senator ALEXANDER. Thank you, Mr. Secretary.

We have been joined by Senator Murray and Tester and Kennedy.

We will now begin a round of questions if your schedules permit that. We will go ahead with a round of 5 minute——

Secretary PERRY. Yes, sir.

Senator ALEXANDER [continuing]. Questions.

Thank you for your testimony. Without objection we will include your full written statement as part of the record as well as the written statement of Administrator Gordon-Hagerty on behalf of the National Nuclear Security Administration.

[The statements follow:]

PREPARED STATEMENT OF SECRETARY HON. RICK PERRY

Chairman Alexander, Ranking Member Feinstein, and Members of the Subcommittee, it is an honor to appear before you today to discuss the President's fiscal year 2019 Budget Request for the Department of Energy ("the Department" or "DOE").

It is a privilege and an honor to serve as the 14th Secretary of Energy.

This budget represents a request to the American people through their representatives in Congress to fund the priorities of this Department.

As such, it represents a commitment from all of us at DOE—that we will honor the trust of our citizens with stewardship, accountability and service.

As Ronald Reagan reminded us in his First Inaugural, "We are a nation that has a government—not the other way around."

When I appeared before this Committee last year, I committed to modernize our nuclear weapons arsenal, protect our energy infrastructure from cyber and other attacks, achieve exascale computing, advance strong domestic energy production, and address obligations regarding nuclear waste management and the Nation's nuclear legacy.

This fiscal year 2019 $30.6 billion budget request for the Department of Energy ("Budget") delivers on these commitments.

The Department's world-leading science and technology enterprise generates the innovations to fulfill our mission. Through our 17 National Laboratories, we engage in cutting-edge research that expands the frontiers of scientific knowledge and generates new technologies to address our greatest challenges.

Our National Laboratories are doing outstanding work in many areas, and they have a rich history of innovation that has bettered the lives of millions across the globe. For example, in fiscal year 2017, the National Laboratories won 33 of the prestigious R&D 100 Awards, including technologies regarding new materials, protecting our environment, incorporating renewable energy reliably on to our electric grid, and sophisticated cybersecurity tools. These are but a few examples of the work the National Laboratories have done just last year to push the boundaries of research, development, and commercialization. I have had the opportunity to visit many of the Laboratories over the past year, and witness first-hand this outstanding work done by the dedicated workforce across the Nation.

I am especially proud of how our National Laboratories, in working with the Department of Veteran's Affairs and other Federal agencies, universities, doctors, and researchers, are harnessing the power of our world-class supercomputers to improve the health of our veterans. This work is part of DOE's proud legacy in the biosciences, and as the initiator of the Human Genome Project.

This Budget proposes over $12 billion in early stage research and development (R&D) that will focus the intellectual prowess of our scientists and engineers on the development of technologies that the ingenuity and capital of America's entrepreneurs and businesses can convert into commercial applications and products to improve the lives and security of all Americans.

Restoring the Nuclear Security Enterprise

The security of the United States and its allies is one of our primary DOE missions.

The Budget fulfills the President's vision of rebuilding and restoring our Nation's security through robust investments in the Department's nuclear security mission. The Budget provides $15.1 billion for the National Nuclear Security Administration (NNSA), $2.2 billion or 16.7 percent above the fiscal year 2017 enacted level.

The Request makes necessary investments consistent with the February 2018 Nuclear Posture Review (NPR) to modernize and rebuild a nuclear force and nuclear

security enterprise; prevent, counter, and respond to nuclear proliferation and terrorism threats; and provide safe, reliable, and long-term nuclear propulsion to the Nation's Navy.

The Budget includes $11.0 billion for Weapons Activities. This $1.8 billion increase over the fiscal year 2017 enacted level supports maintaining the safety, security, and effectiveness of the nuclear stockpile; continuing the nuclear modernization program; and modernizing NNSA's nuclear security infrastructure portfolio in alignment with the NPR.

The Budget includes $1.9 billion for our ongoing Life Extension Programs (LEP) and Major Alterations, a $580 million increase. Funding for the W76–1 warhead LEP supports the Navy and will keep the LEP on schedule and on budget to complete production in fiscal year 2019. An increase of $178 million for the B61–12 LEP will keep us on schedule to deliver the First Production Unit (FPU) in fiscal year 2020 to consolidate four variants of the B61 gravity bomb and improve the safety and security of the oldest weapon system in our nuclear arsenal.

The Budget also supports the Air Force's Long-Range Stand-Off program through an increase of $435 million from fiscal year 2017 enacted for the W80–4 LEP, to deliver the first production unit in fiscal year 2025 of the cruise missile warhead. We also increase funding by $23 million for the W88 Alteration 370 to provide the scheduled first production unit in fiscal year 2020. The request includes $53 million for a replacement for the W78, one of the oldest warheads in the stockpile, by 2030.

The Budget for Weapons Activities also increases investments to modernize our nuclear infrastructure. For example, we include $703 million, a $128 million increase from fiscal year 2017, for construction of the Uranium Processing Facility needed to replace deteriorating facilities at the Y–12 National Security Complex, as well as $27 million for a Tritium Production Capability at Savannah River and $19 million for a Lithium Production Capability at Y–12.

The Weapons Activities Budget request also includes $163 million, a $68 million increase from fiscal year 2017 enacted, for NNSA collaboration with the Office of Science on the development of exascale computer systems, which I address below.

In the NNSA's Naval Reactors program, the Department has the ongoing responsibility to provide militarily effective nuclear propulsion plants for Navy vessels and to ensure their safe, reliable and long-lived operation. The Budget provides $1.8 billion to support the safe and reliable operation of the Navy's nuclear-powered fleet and continuation of the Columbia-class submarine program, refueling of the Land-Based Prototype reactor, and the Spent Fuel Handling Recapitalization Project.

Today, over 45 percent of the Navy's major combatants are nuclear powered. DOE's role in propulsion plants, spent fuel handling, and recapitalization is critical to the Navy's ability to conduct its mission around the globe.

The Budget also includes $1.9 billion for the Defense Nuclear Nonproliferation (DNN) program to reduce global threats from nuclear weapons. This critical national security program prevents the spread of nuclear and radiological materials, advances technologies that detect nuclear and radiological proliferation worldwide, and eliminates or secures inventories of surplus materials and infrastructure usable for nuclear weapons.

The Budget continues termination activities for the Mixed Oxide Fuel Fabrication Facility project proposed in the fiscal year 2018 Request, providing $220 million for use toward an orderly and safe closure of the project. The Budget also includes $59 million for the continuation of preliminary design and the initiation of long-lead procurements for the Surplus Plutonium Disposition project in support of the dilute and dispose strategy.

The Budget provides $319 million for Nuclear Counterterrorism and Incident Response, $47 million above fiscal year 2017 enacted, to work domestically and around the world to improve our ability to respond to radiological or nuclear incidents, in conjunction with other agencies in a broader U.S. Government effort.

Finally, the Budget includes $423 million for the Federal workforce at the NNSA. This $35 million increase is essential to ensuring our world-class workforce of dedicated men and women can effectively oversee NNSA's critical national security missions.

Securing Against Cyber Threats

Among the most critical missions at the Department is to develop science and technology that will ensure Americans have a resilient electric grid and energy infrastructure. Protecting this infrastructure means it has to be resilient and secure to defend against the evolving threat of cyber and other attacks.

Unfortunately, cyberattacks pose an ever-increasing threat to the Nation's networks, data, facilities, and infrastructure. A reliable and resilient power grid is critical to U.S. economic competiveness and leadership, and to the safety and security

of the Nation. We need to understand the increasing and evolving natural and man-made threats and develop the tools to respond to those threats across our energy infrastructure.

The Department is the sector-specific agency for the energy sector, and therefore, is the lead Federal agency for the Emergency Support Function #12 that partners with the energy sector to ensure infrastructure security and resilience and to coordinate response and recovery. To elevate the Department's focus on energy infrastructure protection, the Budget Request splits the Office of Electricity Delivery and Energy Reliability, which totals $157 million, into two offices. Doing so will increase focus on grid reliability in the Office of Electricity Delivery (OE) and cybersecurity in the Office of Cybersecurity, Energy Security, and Emergency Response (CESER).

CESER will allow more coordinated preparedness and response to emerging cyber and physical threats and natural disasters and support the Department's national security responsibilities. To work toward this critical objective, the Budget provides $96 million for the CESER office to develop tools needed to protect the U.S. energy sector against threats and hazards, mitigate the risks and the extent of damage from cyberattacks and other disruptive events, and improve resilience through the development of techniques for more rapid restoration of capabilities.

CESER will work in an integrated manner with private industry, as well as Federal, State, and Local jurisdictions and other DOE offices, to enable industry to enhance the resilience (the ability to withstand and quickly recover from disruptions and maintain critical function) and security (the ability to protect system assets and critical functions from unauthorized and undesirable actors) of the U.S. energy infrastructure.

Also, in fiscal year 2019, the Office of Nuclear Energy's budget includes $5 million for the Nuclear Energy Enabling Technologies (NEET) Crosscutting Technology Development (CTD) program to expand its nuclear reactor cybersecurity research to support development of intrusion-resistant systems and practices. Research will be conducted in four areas: cyber risk management, secure architectures, modeling and simulation, and supply chain cyber security assurance. NEET–CTD will also perform simulated cyber-attacks against existing and next generation control system architectures to verify attack difficulty and control efficacy, methods, and metrics.

Securing against cyber threats means we must also protect against threats to the Department's own infrastructure in science, technology, and nuclear security. This Budget takes major steps to safeguard DOE's enterprise-wide assets against cyber threats. The Budget provides funding to secure our own networks, and increases funding for the Chief Information Officer by $16 million from the fiscal year 2017 enacted level to modernize infrastructure and improve cybersecurity across the DOE IT enterprise. Funding for cybersecurity in the National Nuclear Security Administration is increased to $185 million to enhance security for our nuclear security enterprise. In the Environmental Management program, we provide $43 million for cybersecurity to ensure the security at seven cleanup sites. This Budget provides the resources we require to secure our systems and our infrastructure.

Improving Grid Resilience

As we protect our energy infrastructure from cyber threats, we also must improve resilience and reliability of the Nation's electricity system. The Budget provides $61 million for Electricity Delivery to support transmission system resource adequacy and generation diversity, move forward with new architecture approaches for the transmission and distribution system to enhance security and resilience, and advance energy storage. The Budget supports research and development at DOE's National Laboratories to develop technologies that strengthen, transform, and improve energy infrastructure so that consumers have access to reliable and secure sources of energy.

Advancing Exascale and Quantum Computing

As I discussed last year, the Department's leadership in developing and building the world's fastest computers has faced increasingly fierce global competition over the last decade. Maintaining the Nation's global primacy in high-performance computing is more critical than ever for our national security, our continuing role as a science and innovation leader, and our economic prosperity.

The Budget includes $636 million to accelerate development of an exascale computing system, including $473 million in the Office of Science (Science) and $163 million in NNSA. This unprecedented investment, which is $376 million—or 145 percent—above the fiscal year 2017 enacted level, reflects the Department's plan to deliver an exascale machine for the Office of Science in 2021 and a second machine with a different architecture by 2022.

To achieve these goals, the Science/NNSA partnership will focus on hardware and software technologies needed to produce an exascale system, and the critical DOE applications needed to use such a platform. This world-leading exascale program will bolster our national security by supporting the nuclear stockpile, while also supporting the next generation of scientific breakthroughs not possible with today's computing systems.

We will not, however, satisfy our need for computing advances with the achievement of exascale computing alone. The fiscal year 2019 Budget Request also includes $105 million in quantum computing to address the emerging urgency of building our competency and competitiveness in the developing area of quantum information science. This early-stage, fundamental research will concentrate on accelerating progress toward application of quantum computing techniques and quantum sensing to grand challenge science questions.

Addressing the Imperative of Nuclear Waste Management

As I mentioned to this Committee last year, we must move ahead in fulfilling the Federal Government's responsibility to dispose of the Nation's nuclear waste. The Budget includes $120 million, including $30 million in defense funds, to resume licensing for the nuclear waste repository at Yucca Mountain and implement a robust interim storage program.

The Budget devotes $110 million for DOE to support the Nuclear Regulatory Commission (NRC) licensing proceeding for the nuclear waste repository at Yucca Mountain, including funding for technical, scientific, legal and other support.

In addition, the Budget includes $10 million to implement a robust interim storage program to ensure earlier acceptance of spent nuclear fuel and accelerate removal from sites in 39 States across the country. Interim storage capability also adds flexibility to the system that will move materials from sites across the country to its ultimate disposition.

By restarting the long-stalled licensing process for Yucca Mountain and committing to establishing interim storage capability for near-term acceptance of spent nuclear fuel, our Budget demonstrates the Administration's commitment to nuclear waste management and will help accelerate fulfillment of the Federal Government's obligations to address nuclear waste, enhance national security, and reduce future burdens on taxpayers. This also will increase public confidence in the safety and security of nuclear energy, thus helping nuclear energy to remain a significant contributor to the country's energy needs for generations to come.

Fulfilling Legacy Cleanup Responsibilities

The Budget also includes $6.6 billion for Environmental Management (EM), $182 million above the fiscal year 2017 enacted level, to address its responsibilities for the cleanup and disposition of excess facilities, radioactive waste, spent nuclear fuel, and other materials resulting from five decades of nuclear weapons development and production and Government-sponsored nuclear energy research.

To date, EM has completed cleanup activities at 91 sites in 30 States and Puerto Rico, and is responsible for cleaning up the remaining 16 sites in 11 States—some of the most challenging sites in the cleanup portfolio.

The Budget continues funding of $150 million to address specific high-risk contaminated excess facilities at the Y–12 National Security Complex and the Lawrence Livermore National Laboratory.

The Budget includes $1.4 billion for the Office of River Protection at the Hanford Site, for continued work at the Hanford Tank Farms and to make progress on the Waste Treatment and Immobilization Plant. This budget will continue progress toward important cleanup required by the Consent Decree and Tri-Party Agreement to include a milestone to complete hot commissioning of the Low Activity Waste Facility by December 31, 2023. The Budget also includes $747 million to continue cleanup activities at Richland, including continued K-Area decontamination and decommissioning remediation and the K-West Basin sludge removal project. For Savannah River, the Budget provides $1.7 billion, $287 million above enacted fiscal year 2017, to support activities at the site. This will include the Liquid Tank Waste Management Program, completing commissioning and beginning operation of the Salt Waste Processing Facility, continued construction of the Saltstone Disposal Unit #7, a start to construction of the Saltstone Disposal Units #8/9, and support for facilities that receive and store nuclear materials.

The Waste Isolation Pilot Plant (WIPP) is essential for the disposition of transuranic defense-generated waste across the DOE complex, and the Budget provides $403 million to safely continue waste emplacement at WIPP. The Budget Request will continue WIPP operations, including waste emplacements, shipments, and maintaining enhancements and improvements, and progress on critical infrastruc-

ture repair/replacement projects, including $84 million for the Safety Significant Confinement Ventilation System and $1 million for the Utility Shaft (formerly Exhaust Shaft). These steps will increase airflow in the WIPP underground for simultaneous mining and waste emplacement operations.

The Budget includes $359 million to continue cleanup projects at the Idaho site, such as the Integrated Waste Treatment Unit, and to process, characterize, and package transuranic waste for disposal at offsite facilities. It provides $409 million for Oak Ridge to continue deactivation and demolition of remaining facilities at the East Tennessee Technology Park, continue preparation of Building 2026 to support processing of the remaining U–233 material at the Oak Ridge National Laboratory, and support construction activities for the Outfall 200 Mercury Treatment Facility at the Y–12 National Security Complex.

For Portsmouth, the Budget includes $415 million, $33 million above fiscal year 2017 enacted, to continue progress on the deactivation and decommissioning project at the Portsmouth Gaseous Diffusion Plant, safe operation of the Depleted Uranium Hexafluoride Conversion Facility, and construction activities at the On-Site Waste Disposal facility. At Paducah, the Budget includes $270 million to continue ongoing environmental cleanup and depleted uranium hexafluoride (DUF6) conversion facility operations at the Paducah site. In addition, the fiscal year 2019 Budget Request supports activities to continue the environmental remediation and further stabilize the gaseous diffusion plant.

Together, these investments for Environmental Management will make significant progress in fulfilling our cleanup responsibilities while also starting to address our high-risk excess facilities at NNSA sites.

Focusing Priorities on Core Missions

The Budget continues to focus the Department's energy and science programs on early-stage research and development at our National Laboratories to advance American primacy in scientific and energy research in an efficient and cost- effective manner.

Also, in line with Administration priorities, the Budget terminates the Advanced Research Projects Agency-Energy, known as ARPA–E, and the Department's Loan Programs, while maintaining necessary Federal staff to oversee existing awards and loans. Termination of these programs will save over $300 million in fiscal year 2019 alone while significantly reducing financial risk to the taxpayer moving forward.

Advancing American Energy Dominance

The Budget requests $2.1 billion for the applied energy programs. Within these offices, the fiscal year 2019 Budget focuses resources on early-stage, cutting-edge R&D conducted by the scientists and engineers at our 17 National Laboratories who continually develop the next great innovations that can transform society and foster American economic competitiveness and then on transitioning these breakthroughs to the private marketplace.

The Budget consolidates programs focused on bringing technologies to the market in the Office of Technology Transitions, requesting a 23 percent increase from fiscal year 2017. Through concerted effort and coordination with our labs, this will reduce costs to the taxpayer while at the same time providing a robust technology transfer program to transfer breakthroughs from the National Laboratories to the private sector.

Nuclear Energy

Nuclear energy provides 20 percent of our electricity baseload, and 60 percent of our carbon-free generated electricity. The Budget provides $757 million for the Office of Nuclear Energy to continue innovating new and improved nuclear energy technologies. The budget focuses funding on early-stage research and development, such as the Nuclear Energy Enabling Technologies program, that enables the research and development of innovative and crosscutting nuclear energy technologies to resolve fundamental nuclear technology challenges.

The fiscal year 2019 Budget includes $163 million for the Reactor Concepts Research, Development and Demonstration program. Within this total, $128 million is for early-stage R&D on advanced reactor technologies, including $54 million for a new Advanced Small Modular Reactor R&D subprogram. This new subprogram is a one-time effort to fund cost-shared early-stage design-related technical assistance and R&D, the results of which are intended to be widely applicable and employed by nuclear technology development vendors for the purpose of accelerating the development of their advanced SMR designs. The Budget also provides $15 million within Reactor Concepts for early-stage R&D and pre-conceptual design work related to Versatile Advanced Fast Test Reactor concept.

Within the Fuel Cycle Research and Development program, the Budget provides $40 million to support the development of one or more light water reactor fuel concepts with significantly enhanced accident tolerance.

Finally, the Budget for Nuclear Energy also supports robust safeguards and security funding of $136 million—a $7 million increase—for protection of our nuclear energy infrastructure and robust infrastructure investments at INL facilities.

Fossil Energy Research and Development

The Fossil Energy Research and Development (FER&D) program advances transformative science and innovative technologies which enable the reliable, efficient, affordable, and environmentally sound use of fossil fuels. Fossil energy sources currently constitute over 81 percent of the country's total energy use and are critical for the Nation's security, economic prosperity, and growth. The fiscal year 2019 Budget focuses $502 million on cutting-edge fossil energy research and development to secure energy dominance, further our energy security, advance strong domestic energy production, and support America's coal industry through innovative clean coal technologies.

FER&D will support early-stage research in advanced technologies, such as materials, sensors, and processes, to expand the knowledge base upon which industry can improve the efficiency, flexibility, and resilience of the existing fleet of coal fired power plants. The request also focuses funding on early-stage research that enables the next generation of high efficiency and low emission coal fired power plants that can directly compete with other sources of electricity in the market and provide low cost reliable power 24/7.

Funding is also provided to support competitive awards with industry, National Laboratories and academia focused on innovative early-stage R&D to improve the reliability, availability, efficiency, and environmental performance of advanced fossil-based power systems. For example, the Advanced Energy Systems subprogram will focus on the following six activities: (1) Advanced Combustion/Gasification Systems, (2) Advanced Turbines, (3) Solid Oxide Fuel Cells, (4) Advanced Sensors and Controls, (5) Power Generation Efficiency, and (6) Advanced Energy Materials. While the primary focus is on coal-based power systems, improvements to these technologies will result in spillover benefits that can reduce the cost of converting other carbon-based fuels, such as natural gas, biomass, or petroleum coke into power and other useful products in an environmentally- sound manner.

Energy Efficiency and Renewable Energy

The Energy Efficiency and Renewable Energy budget funds $696 million to maintain America's leadership in transformative science and emerging energy technologies in sustainable transportation, renewable power, and energy efficiency. Knowledge generated by early-stage R&D enables U.S. industries, businesses and entrepreneurs to develop and deploy innovative energy technologies and gives them the competitive edge needed to excel in the rapidly changing global energy economy.

Energy storage is an important area of focus, and the Request includes $36 million for battery R&D as well as $90 million for a new "Beyond Batteries" R&D initiative. As part of grid modernization efforts, "Beyond Batteries" considers energy storage holistically, and focuses on advances in controllable loads, hybrid systems, and new approaches to energy storage, which are essential to increasing the reliability and resiliency of our energy systems.

Advances in these areas, as well as in battery technologies, will allow for loads to be combined with generation from all sources to optimize use of existing assets to provide grid services, and increase grid reliability. The fiscal year 2019 also invests in advanced combustion engines, and new science and technology for developing biofuels. The Budget funds research into the underpinnings of future generations of solar photovoltaic technology, into the design and manufacturing of low-specific power rotors for tall wind applications, and on wind energy grid integration and infrastructure challenges.

The Budget also funds early-stage R&D for advanced manufacturing processes and materials technologies. These efforts, combined with the research that leverages the unique high-performance computing assets in the National Laboratories, can drive the breakthroughs that will promote economic growth and manufacturing jobs in the United States.

Leading World-Class Scientific Research

The Department of Energy is the Nation's largest Federal supporter of basic research in the physical sciences, and the President's fiscal year 2019 Budget provides $5.4 billion for the Office of Science to continue and strengthen American leadership in scientific inquiry. By focusing funding on early-stage research, this Budget will ensure that the Department's National Laboratories continue to be the backbone of

American science leadership by supporting cutting-edge basic research, and by building and operating the world's most advanced scientific user facilities—which will be used by over 22,000 researchers in fiscal year 2019.

We provide $899 million for Advanced Scientific Computing Research, an increase of $252 million above the fiscal year 2017 enacted level. This funding will continue supporting our world-class high-performance computers that make possible cutting-edge basic research, while devoting $472 million in the Office of Science to reflect the Department's plan to achieve of exascale computing by 2021. This focused effort will drive the innovations necessary for computing at exascale speeds, resulting in computing systems at unprecedented speeds at Argonne National Laboratory in 2021 and Oak Ridge National Laboratory in 2022. The fiscal year 2019 Request also supports quantum computing R&D and core research in applied mathematics and computer science, and high-performance computer simulation and modeling.

The Budget also provides $1.8 billion for Basic Energy Sciences, supporting core research activities in ultrafast chemistry and materials science and the Energy Frontier Research Centers. We will continue construction of the Linac Coherence Light Source-II at SLAC National Accelerator Laboratory and the Advanced Photon Source Upgrade at the Argonne National Laboratory, and initiate the Advanced Light Source Upgrade project at the Lawrence Berkeley National Laboratory, and the Linac Coherence Light Source-II High Energy project at SLAC. The operations of the light sources across the DOE science complex and supporting research across the Nation will ensure our continued world leadership in light sources and the science they make possible.

The Budget also provides $770 million for High Energy Physics, including $113 million for construction of the Long Baseline Neutrino Facility and Deep Underground Neutrino Experiment at Fermilab, $63 million above the enacted fiscal year 2017 level. We will continue to fund ongoing major items of equipment projects, and initiate three new projects at the Large Hadron Collider, the High Luminosity Large Hadron Collider Accelerator Project, and the High Luminosity ATLAS and CMS detector upgrade projects. By supporting the highest priority activities and projects identified by the U.S. high energy physics community, this program will continue cutting-edge pursuit to understand how the universe works at its most fundamental level.

The Budget for the Office of Science provides $340 million for Fusion Energy Sciences, including $265 million for domestic research and fusion facilities and $75 million for the ITER project. For Nuclear Physics, the budget provides $600 million to discover, explore, and understand nuclear matter, including $75 million for continued construction of the Facility for Rare Isotope Beams and operations of facilities, including the newly-upgraded Continuous Electron Beam Accelerator Facility. For Biological and Environmental Research, the Budget includes $500 million to support foundational genomic sciences, including the Bioenergy Research Centers and to focus on increasing the sensitivity and reducing the uncertainty of earth and environmental systems predictions.

Strategic Petroleum Reserve

In addition to our nuclear security responsibilities, the Department of Energy ensures the Nation's energy security. The Strategic Petroleum Reserve (SPR), one component of that effort, protects the U.S. economy from disruptions in critical petroleum supplies and meets the U.S. obligations under the International Energy Program. The Budget includes $175.1 million, $47.5 million below the fiscal year 2017 enacted level, to support the Reserve's operational readiness and drawdown capabilities. The Request also includes a drawdown and sale of up to 1 million barrels of crude oil from the SPR to provide funding for Congressionally-mandated crude oil sales and emergency drawdown operations.

The Budget continues the sale of SPR oil for the Energy Security and Infrastructure Modernization Fund authorized by the Bipartisan Budget Act of 2015 to support an effective modernization program for the SPR.

Finally, as the Northeast Gasoline Supply Reserve (NGSR) is operationally ineffective and not cost-efficient as a regional product reserve, the President's Budget proposes to liquidate the NGSR and sell its one million barrels of refined petroleum product in fiscal year 2019, resulting in an estimated $77 million in receipts.

Power Marketing Administrations

Finally, the Budget includes $77 million for the Power Marketing Administrations (PMAs). The Budget proposes the sale of the transmission assets of the Western Area Power Administration (WAPA), the Bonneville Power Administration (BPA), and the Southwestern Power Administration (SWPA) and to reform the laws governing how the PMAs establish power rates to require the consideration of market

based incentives, including whether rates are just and reasonable. The Budget also proposes to repeal the $3.25 billion borrowing authority for WAPA authorized by the American Recovery and Reinvestment Act of 2009.

Conclusion

In conclusion, I reaffirm my commitment to ensure that the Department of Energy, along with its national laboratories, will continue to support the world's best enterprise of scientists and engineers who create innovations to drive American prosperity, security and competitiveness. The President's fiscal year 2019 Budget Request for the Department of Energy positions us to take up that challenge and delivers on the high-priority investments I proposed to you last year.

As we move forward over the coming weeks and months, I look forward to working with you and your colleagues in Congress on the specific programs mentioned in this testimony and throughout the Department. Congress has an important role in the path forward on spending decisions for the taxpayer, and I will, in turn, ensure DOE is run efficiently, effectively, and we accomplish our mission driven goals. Thank you, and I look forward to answering your questions.

PREPARED STATEMENT OF HON. LISA E. GORDON-HAGERTY

Chairman Alexander, Ranking Member Feinstein, and Members of the Subcommittee, thank you for the opportunity to present the President's fiscal year 2019 budget request for the Department of Energy's (DOE) National Nuclear Security Administration (NNSA). NNSA deeply appreciates the Committee's strong support for the nuclear security mission and for the extraordinary people and organizations that are responsible for its execution.

The President's fiscal year 2019 budget request for NNSA is $15.1 billion, an increase of $1.2 billion or 8.3 percent over the fiscal year 2018 request. The request represents approximately 50 percent of DOE's total budget. This budget request demonstrates the Administration's strong support for NNSA and reinforces the recently released Nuclear Posture Review (NPR) and National Security Strategy (NSS). We will continue to work with the Department of Defense (DoD) to determine the resources, time, and funding required to address policies laid out in the NPR, including the potential low yield ballistic missile warhead, sea launched cruise missile, and B83–1 gravity bomb. We live in an evolving international security environment that is more complex and demanding than any since the end of the Cold War, which necessitates a national commitment to maintain modern and effective nuclear forces and infrastructure. To remain effective, however, recapitalizing our Cold War legacy nuclear forces is critical.

NNSA's enduring missions remain vital to the national security of the United States: maintaining the safety, security, reliability, and effectiveness of the nuclear weapons stockpile; reducing the threat of nuclear proliferation and nuclear terrorism around the world; and providing nuclear propulsion for the U.S. Navy's fleet of aircraft carriers and submarines. The President's fiscal year 2019 budget request is reflective of this Administration's strong support for NNSA and ensures that U.S. nuclear forces are modern, robust, flexible, resilient, ready, and appropriately tailored to deter 21st-century threats and reassure America's allies.

Attracting, training, and retaining a skilled and experienced workforce is critical to NNSA's ability to accomplish its diverse missions. NNSA's dedicated and highly talented cadre of Federal employees and Management and Operating (M&O) contract partners must be supported with the tools necessary to support the complex and challenging responsibilities found only within NNSA's nuclear security enterprise. NNSA's infrastructure is in a brittle state that requires significant and sustained investments over the coming decade to correct. There is no margin for further delay in modernizing NNSA's scientific, technical, and engineering capabilities, and recapitalizing our infrastructure needed to produce strategic materials and components for U.S. nuclear weapons.

The fiscal year 2019 budget request also reflects the close partnerships between NNSA and other Federal departments and agencies. NNSA collaborates with DoD to meet military requirements, support the Nation's nuclear deterrent, and modernize the nuclear security enterprise. NNSA also partners with a range of Federal agencies, to prevent, counter, and respond to nuclear proliferation and nuclear terrorism.

NNSA is mindful of its obligation to be responsible stewards of the resources entrusted by Congress and the American taxpayers. Our fiscal year 2019 budget request is the result of a disciplined process to prioritize funding for validated require-

ments as designated by the Administration and sets the foundation to implement policies from the NPR and NSS.

Weapons Activities Appropriation

The fiscal year 2019 budget request for the Weapons Activities account is $11.0 billion, an increase of $777.7 million or 7.6 percent over fiscal year 2018 request levels. Nuclear deterrence remains the bedrock of America's national security. Given the criticality of effective U.S. nuclear deterrence to the safety of the American people, allies, and partners, there is no doubt that NNSA's sustainment and replacement program should be regarded as both necessary and affordable. The programs funded in this account support the Nation's current and future defense posture and the associated nationwide infrastructure of science, technology, and engineering capabilities.

The Weapons Activities account supports the maintenance and refurbishment of nuclear weapons to maintain safety, security, and reliability; investments in scientific, engineering, and manufacturing capabilities to certify the enduring nuclear weapons stockpile; and the fabrication of nuclear weapon components. This account also includes investments in enterprise-wide infrastructure sustainment activities, physical and cybersecurity activities, and the secure transportation of nuclear materials.

Maintaining the Stockpile

This year, the work of the science-based Stockpile Stewardship Program again supported the Secretaries of Energy and Defense in certifying to the President for the 22nd consecutive year, that the U.S. nuclear weapons stockpile remains safe, secure, and reliable without the need for nuclear explosive testing. This remarkable scientific achievement is made possible through the work accomplished by NNSA's world-class scientists, engineers, and technicians, and through investments in state-of-the-art diagnostic tools, high performance computing platforms, and modern facilities.

For Directed Stockpile Work (DSW), the fiscal year 2019 budget request is $4.7 billion, an increase of $689.0 million or 17.3 percent over the fiscal year 2018 request. Included within this request is funding to support the life extension programs (LEPs) for the W76, B61, and W80, and a major alteration of the W88; and advance the ground based strategic deterrent, by 1 year to 2019, and investigate feasibility of interoperable aspects for other types of warheads. These LEPs are aligned with the needs outlined in the NPR and with the approved Nuclear Weapons Council strategic plan.

—*W76–1 LEP*: The $113.9 million requested for the W76–1 LEP directly supports the sea- based leg of the nuclear triad by extending the service life of the original W76–0 warhead. With continued funding, the W76–1 LEP will remain on schedule and on budget to complete production in fiscal year 2019.

—*B61–12 LEP*: NNSA continues to make progress on the B61–12 LEP that will consolidate four variants of the B61 gravity bomb. This LEP will meet military requirements for reliability, service-life, field maintenance, safety, and use control while also addressing multiple components nearing end of life in this oldest nuclear weapon in the stockpile. With the $794.0 million requested, NNSA will remain on schedule to deliver the First Production Unit (FPU) of the B61–12 in fiscal year 2020. NNSA is responsible for refurbishing the nuclear explosives package and updating the electronics for this weapon. The Air Force will provide the tail kit assembly under a separate acquisition program. When fielded, the B61–12 gravity bomb will support both Air Force long-range nuclear-capable bombers and dual-capable fighter aircraft and bolster central deterrence for the United States while also providing extended deterrence to America's allies and partners.

—*W88 Alteration 370 Program*: Currently in the Production Engineering Phase (Phase 6.4), the W88 Alt 370 is on schedule, with FPU planned in December 2019. The budget request for this program, which also supports the sea-based leg of the nuclear triad, is $304.3 million in fiscal year 2019.

—*W80–4 LEP*: The current air-launched cruise missile delivers a W80 warhead first deployed in 1982. Both the missile and the warhead are well past planned end of life and are exhibiting aging issues. To maintain this vital deterrent capability, NNSA requests $654.8 million in fiscal year 2019, an increase of $255.7 million or 64.1 percent over the fiscal year 2018 request to extend the W80 warhead, through the W80–4 LEP, for use in the Air Force's Long Range Stand-Off (LRSO) cruise missile. This funding supports a significant increase in program activity through the Design Definition and Cost Study Phase on a

timeline consistent with the DoD's LRSO missile platform modernization schedule.

—*Interoperable Warhead 1 (IW1)*: The IW1 program will replace one of the oldest warheads in the stockpile, and provide improved warhead security, safety, and use control. To replace the Air Force employed W78 warhead, NNSA is requesting $53.0 million to support the scheduled restart of the feasibility study and design options work suspended in 2014. Technology development efforts are focused on supporting the W78 warhead replacement and investigate the feasibility of interoperable aspects for other types of warheads. To reduce risk, investments will initially be made against technologies that are less than technology readiness level 5.

Within DSW, the fiscal year 2019 budget request includes $619.5 million for Stockpile Systems. This program sustains the stockpile in accordance with the Nuclear Weapon Stockpile Plan by producing and replacing limited-life components such as neutron generators and gas transfer systems; conducting maintenance, surveillance, and evaluations to assess weapon reliability; detecting and anticipating potential weapon issues; and compiling and analyzing information during the Annual Assessment process.

The DSW also requests $1.1 billion for Stockpile Services to support the modernization of capabilities to improve efficiency of manufacturing operations to meet future requirements. The Stockpile Services request supports all DSW operations by funding programmatic and infrastructure management, and maintaining the core competencies and technologies essential for reliable and operable stewardship capabilities.

Strategic Materials are key for the safety, security, and effectiveness of the Nation's nuclear deterrent and are used for addressing national security concerns such as nuclear nonproliferation and counterterrorism missions. The requested funding is necessary to maintain NNSA's ability to produce the nuclear and other strategic materials associated with nuclear weapons as well as refurbish and manufacture components made from these materials. The program includes Uranium Sustainment, Plutonium Sustainment, Tritium Sustainment, Domestic Uranium Enrichment (DUE), and other strategic materials, such as lithium.

—*Strategic Materials Sustainment*: The $218.8 million for the Strategic Materials Sustainment program will develop and implement strategies to maintain the technical base for strategic materials in support of NNSA's nuclear weapons, non-proliferation, and naval reactors activities at NNSA's eight sites.

—*Uranium Sustainment*: Funding for Uranium Sustainment supports the program to maintain existing enriched uranium capabilities through enhanced equipment maintenance while preparing to phase out mission dependency on Building 9212, a Manhattan Project-era production facility at the Y–12 National Security Complex (Y–12) in Oak Ridge, Tennessee. The funding request of $87.2 million will assist NNSA in sustaining uranium manufacturing capabilities while accelerating planning and execution of the Building 9212 Exit Strategy to reduce risks associated with transitioning enriched uranium capabilities to the Uranium Processing Facility (UPF) that is under construction.

—*Plutonium Sustainment*: The $361.3 million requested for Plutonium Sustainment supports continued progress to meet pit production requirements. The requested funding increase would support efforts to begin the long term plan to develop a capability to produce no fewer than 80 W87-like war reserve pits per year by 2030, as directed in the NPR.

—*Tritium Sustainment*: The fiscal year 2019 budget request of $205.3 million will support the Nation's capacity to provide the tritium necessary for national security requirements. Tritium will be produced by irradiating Tritium Producing Burnable Absorber Rods in designated Tennessee Valley Authority nuclear power plants and by recovering and recycling tritium from gas transfer systems returned from the stockpile at the SRS Tritium Extraction Facility.

—*Lithium Sustainment*: The fiscal year 2019 budget request establishes a separate Lithium Sustainment Program of $29.1 million that supports a Lithium Bridging Strategy to maintain the production of the Nation's enriched lithium supply in support of the nuclear security mission, DOE's Office of Science, and DHS.

—*Domestic Uranium Enrichment*: The DUE program, with a request of $100.7 million in fiscal year 2019, will continue efforts to make available when needed the necessary supplies of enriched uranium for a variety of national security needs.

For Research, Development, Test, and Evaluation (RDT&E), the fiscal year 2019 budget request is $2.0 billion, a decrease of $33.0 million or 1.6 percent below the fiscal year 2018 request.

Increases for the Science Program ($564.9 million) provide additional funding to support subcritical experiments for pit reuse and advanced diagnostics for subcritical hydrodynamic integrated weapons experiments that produce key data for stockpile certifications.

The Engineering Program ($211.4 million) sustains NNSA's capability for creating and maturing advanced toolsets and technologies to improve weapon surety and support annual stockpile assessments.

The Inertial Confinement Fusion Ignition and High Yield Program in fiscal year 2019 ($418.9 million) will continue to build upon prior accomplishments. These efforts continue to provide key data to reduce uncertainty in calculations of nuclear weapons performance and improve the predictive capability of science and engineering models in high-pressure, high-energy, high-density regimes.

The RDT&E request for fiscal year 2019 includes $703.4 million for the Advanced Simulation and Computing (ASC) Program, and continues NNSA's program of collaboration with DOE's Office of Science to implement DOE's Exascale Computing Initiative. NNSA's ASC Program will support stockpile stewardship by developing and deploying predictive simulation capabilities for nuclear weapons systems. NNSA is taking major steps in high-performance computing by deploying increasingly powerful computational capabilities at both Los Alamos National Laboratory (LANL) and Lawrence Livermore National Laboratory.

The 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 Office of Secure Transportation has an elite workforce performing sensitive and demanding work; agents are among the most highly trained and dedicated national security personnel operating within the United States. The fiscal year 2019 budget request of $278.6 million continues our efforts to modernize and replace the existing fleet of transporters and efforts to hire and train an additional 40 agents. The fiscal year 2019 funding also supports the Safeguards Transporter (SGT) risk reduction initiatives to extend the life of the SGT to meet the STA mission capacity.

NNSA's Office of Defense Programs also maintains the vitality of the broader nuclear security enterprise that supports other agencies' nuclear missions. An important aspect of this effort is investment in Laboratory, Site and Plant Directed Research and Development. As confirmed by independent reviews, this type of defense research and development investment provides basic research funding to foster innovation and to attract and retain scientific and technical talent and is critical to the long-term sustainment of our national laboratories.

Improving Safety, Operations, and Infrastructure

NNSA's diverse national security missions are dependent upon the safety and reliability of its infrastructure. More than half of NNSA's facilities are over 40 years old, and roughly 30 percent date back to the Manhattan Project era. If left unaddressed, the condition and age of NNSA's infrastructure will put NNSA's missions, the safety of its workforce, the public, and the environment at risk. As reaffirmed in the NPR, "An effective, responsive, and resilient nuclear weapons infrastructure is essential to the U.S. capacity to adapt flexibly to shifting requirements. Such an infrastructure offers tangible evidence to both allies and potential adversaries of U.S. nuclear weapons capabilities and can help to deter, assure, hedge against adverse developments, and discourage adversary interest in arms competition." The fiscal year 2019 budget request for Infrastructure and Operations is $3.0 billion, an increase of $199.6 million or 7.1 percent above the fiscal year 2018 request. The fiscal year 2018 National Defense Authorization Act provided NNSA and its M&O partners with additional flexibility to address the challenges of modernizing the enterprise by increasing the minor construction threshold to $20 million. This reform supports efforts to address deferred maintenance through recapitalization projects that improve the condition and extend the design life of structures, capabilities, and systems to meet NNSA's nuclear weapons and nonproliferation program needs.

The fiscal year 2019 budget request for Infrastructure and Operations includes $1.1 billion for Line Item Construction projects. The requested amount provides the remaining funding of $48.0 million for the Albuquerque Facility, supports UPF at Y–12 ($703.0 million), and continues the Chemistry and Metallurgy Research Replacement project at LANL ($235.1 million). The fiscal year 2019 budget also includes $19.0 million in funding to begin the first steps toward the construction of a new lithium production facility and $6 million for the 138kV Power Transmission System Replacement project to replace and upgrade the current power transmission system for the Mission Corridor at NNSS. Delivering these projects on budget and

schedule is contingent upon stable and predictable funding profiles, and the President's budget request being supported.

Many of NNSA's excess process-contaminated facilities will ultimately be transferred to DOE's Office of Environmental Management for disposition. In the interim, NNSA is focusing on reducing risks where possible. For example, NNSA has made critical investments to stabilize high-risk process contaminated facilities until ultimate disposition, including at Y–12's Alpha 5 and Beta 4 facilities. NNSA also remains committed to reducing the risk of non-process contaminated facilities by dispositioning facilities where possible. In late 2017, NNSA, with the support of Congress, completed the transfer to a private developer of over 200 acres of the aging Bannister Federal Complex in Kansas City, Missouri, eliminating $300 million of repair needs.

Later this spring, completion of the Pantex Drummond Office Building (formerly known as the Administrative Support Complex) at the Pantex Plant outside of Amarillo, Texas will allow NNSA to move nearly 1,000 employees into a modern, energy efficient workspace. After completion of the Pantex Drummond Office building NNSA will also be able to dispose of dilapidated, 1950s-era buildings and eliminate approximately $20 million in deferred maintenance.

Defense Nuclear Security's (DNS) fiscal year 2019 budget request is $690.6 million, an increase of $3.7 million or 0.5 percent over the fiscal year 2018 Request. To execute its enterprise security program, DNS provides funding to the sites for: protective forces, physical security systems, information security and technical security, personnel security, nuclear material control and accountability, and security program operations and planning. The request manages risk among important, competing demands of the physical security infrastructure and includes planning and conceptual design funds for a series of future projects to sustain and recapitalize the Perimeter Intrusion Detection and Assessment Systems at the Pantex Plant and Y–12. Preliminary estimates are included within the recently completed 10-year Physical Security Systems Refresh Plan. Future budget requests will reflect refined and detailed funding requirements.

Information Technology and Cybersecurity enable every element of NNSA's missions. The fiscal year 2019 budget request is $221.2 million, an increase of $34.4 million, or 18.4 percent over the fiscal year 2018 request. The cybersecurity program continuously monitors enterprise wireless and security technologies to meet a wide range of security challenges. The requested funding increase will be used to continue working toward a comprehensive information technology and cybersecurity program to deliver secure crucial information assets. The funding will continue to mature the cybersecurity infrastructure, comprising almost 100 sensors and over 70 data acquisition servers located across the Nation.

Defense Nuclear Nonproliferation Appropriation

The fiscal year 2019 budget request for the Defense Nuclear Nonproliferation account is $1.9 billion, an increase of $69.5 million or 3.9 percent above the fiscal year 2018 request. Defense Nuclear Nonproliferation account activities address the entire nuclear threat spectrum by helping to prevent the proliferation of nuclear weapons, counter the threat of nuclear terrorism, and respond to nuclear and radiological incidents around the world. The fiscal year 2019 budget request funds two program mission areas under the Defense Nuclear Nonproliferation account: the Defense Nuclear Nonproliferation (DNN) Program and the Nuclear Counterterrorism and Incident Response (NCTIR) Program.

Nonproliferation Efforts

The Office of Defense Nuclear Nonproliferation works with international partners to remove or eliminate vulnerable nuclear material; improve global nuclear security through multilateral and bilateral technical exchanges and training workshops; help prevent the illicit trafficking of nuclear and radioactive materials; secure domestic and international civilian buildings containing high-priority radioactive material; provide technical reviews of U.S. export license applications; conduct export control training sessions for U.S. enforcement agencies and international partners; strengthen the International Atomic Energy Agency's ability to detect and deter nuclear proliferation; advance U.S. capabilities to monitor arms control treaties and detect foreign nuclear programs; and maintain organizational readiness to respond to and mitigate radiological or nuclear incidents worldwide.

The Material Management and Minimization (M3) program provides an integrated approach to addressing the risk posed by nuclear materials. The fiscal year 2019 budget request is $332.1 million. The request supports the conversion or shutdown of research reactors and isotope production facilities that use highly enriched uranium (HEU) and acceleration of new, non HEU-based molybdenum-99 produc-

tion facilities in the United States, which recently contributed to the approval of the first Food and Drug Administration-approved U.S.-origin technology to produce the medical isotope. Additionally, the request for M3 supports the removal and disposal of weapons usable nuclear material and continues the transition to the dilute and dispose strategy for surplus plutonium disposition, including the completion of the independent validation of lifecycle cost estimate and schedule for the dilute and dispose strategy.

The Global Material Security program works with partner nations to increase the security of vulnerable nuclear and radioactive materials and improve ability to deter, detect, and investigate illicit trafficking of these materials. The fiscal year 2019 budget request for this program is $337.1 million and includes efforts to secure the most at-risk radioactive material in U.S. high- threat urban areas by 2020.

The Nonproliferation and Arms Control program develops and implements 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 enduring and emerging proliferation challenges requiring the development of innovative policies and approached. The fiscal year 2019 budget request for this program is $129.7 million. This increase serves to improve the deployment readiness of U.S. nuclear disablement and dismantlement verification teams and to enhance export control dual-use license and interdiction technical reviews.

The Defense Nuclear Nonproliferation Research and Development program supports innovative unilateral and multilateral technical capabilities to detect, identify, and characterize foreign nuclear weapons programs, illicit diversion of special nuclear material, and nuclear detonations worldwide. The fiscal year 2019 budget request for this program is $456.1 million.

Nonproliferation Construction consolidates construction costs for DNN projects. The fiscal year 2019 budget request is $279.0 million. As in fiscal year 2018, the Administration proposes termination activities for the Mixed Oxide (MOX) Fuel Fabrication Facility project and continuing to pursue the dilute and dispose option to fulfill the United States' commitment to dispose of 34 metric tons of plutonium. The $220.0 million for the MOX Facility will be used to continue terminating the project and to achieve an orderly and safe closure. The scope and costs will be refined in subsequent budget requests when the termination plan for the MOX project is approved. The request also includes $59.0 million for the Surplus Plutonium Disposition project to support the dilute and dispose strategy.

Nuclear Counterterrorism and Incident Response (NCTIR)

The fiscal year 2019 budget request for NCTIR is $319.2 million, an increase of $41.8 million or 15.1 percent over the fiscal year 2018 request. NNSA's Counterterrorism and Counterproliferation (CTCP) program is part of broader U.S. Government efforts to assess the threat of nuclear terrorism and develop technical countermeasures. The scientific knowledge generated by this program underpins the technical expertise for disabling potential nuclear threat devices, including improvised nuclear devices, supports and informs U.S. nuclear security policy, and guides nuclear counterterrorism and counterproliferation efforts, including interagency nuclear forensics and contingency planning.

The Counterterrorism and Counterproliferation program provides a flexible, efficient, and effective response capability for any nuclear/radiological incident in the United States or abroad by applying the unique technical expertise across NNSA's nuclear security enterprise. Appropriately trained personnel and specialized technical equipment are ready to deploy to provide an integrated response for radiological search, render safe, and consequence management for nuclear/radiological emergencies, national exercises, and security operations for large National Security Special Events.

The CTCP program maintains an operational nuclear forensics capability for predetonation device disassembly and examination, provides operational support for post-detonation assessment, and coordinates the analysis of special nuclear materials. Readiness is maintained to deploy device disposition and device assessment teams, conduct laboratory operations in support of analysis of bulk actinide forensics, and to deploy subject matter expertise and operational capabilities in support of ground sample collections that contribute to conclusions in support of attribution.

NNSA's Aerial Measuring System (AMS) provides airborne remote sensing in the event of a nuclear or radiological accident or incident within the continental United States, as well as in support of high-visibility national security events.

The AMS fleet consists of three B200 fixed-wing aircraft with an average age of 33 years and two Bell 412 helicopters with an average age of 24 years. The age of

the current aircraft leads to unscheduled downtime resulting in reduced mission availability. A recently concluded Analysis of Alternatives on the AMS aircraft determined that recapitalization of the aging aircraft fleet is necessary to continue to provide Federal, State, and local officials with rapid radiological information following an accident or incident. The fiscal year 2019 budget requests $32.5 million as part of a 2-year replacement process for the five aircraft.

The equipment used by NNSA's emergency response teams is aging, resulting in increasing maintenance costs and increasing risks to the emergency response mission. This budget includes funding for incremental recapitalization of incident response equipment consistent with lifecycle planning to maintain operational readiness. This budget also includes funding for state-of-the-art, secure, deployable communications systems that are interoperable with the Federal Bureau of Investigation and DoD mission partners that will help provide decision makers with real-time technical recommendations to mitigate nuclear terrorist threats.

The Emergency Operations program's fiscal year 2019 budget request includes $36 million under NCTIR to support NNSA's Office of Emergency Operations. This funding will support NNSA's all hazard emergency response capabilities, such as providing incident management training and exercise planning, and managing the Emergency Communications Network capability for the Department.

Naval Reactors Appropriation

Advancing Naval Nuclear Propulsion

Nuclear propulsion for the U.S. Navy's nuclear-powered fleet is critical to the security of the United States and its allies as well as the security of global sea lanes. NNSA's Naval Reactors Program remains at the forefront of technological developments in naval nuclear propulsion by advancing new technologies and improvements in naval reactor performance. This preeminence provides the U.S. Navy with a commanding edge in naval warfighting capabilities.

The Naval Reactors fiscal year 2019 budget request is $1.8 billion, an increase of $308.9 million or 20.9 percent above the fiscal year 2018 request. In addition to supporting today's operational fleet, the requested funding is the foundation for Naval Reactors to deliver tomorrow's fleet and recruit and retain a highly-skilled workforce. One of Naval Reactors' three national priority projects, continuing design and development of the reactor plant for the COLUMBIA-Class submarine, featuring a life-of-ship core and electric drive, will replace the current OHIO-Class fleet and provide required deterrence capabilities for decades. The project to refuel a Research and Training Reactor in New York will facilitate COLUMBIA-Class reactor development efforts to provide 20 more years of live reactor-based training for fleet operators. Funding will also be used to support construction of 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 2019 to support these projects and 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 Bettis Atomic Power Laboratory in Pittsburgh, Knolls Atomic Power Laboratory and Kesselring Site in greater Albany, and the spent nuclear fuel facilities in Idaho can perform the research and development, analysis, engineering, and testing needed to support today's fleet at sea and develop future nuclear-powered warships. The laboratories also perform the technical evaluations that enable Naval Reactors to thoroughly assess emergent issues and deliver timely responses to provide nuclear safety and maximize operational flexibility.

NNSA Federal Salaries and Expenses Appropriation

The NNSA Federal Salaries and Expenses fiscal year 2019 budget request is $422.5 million, an increase of $3.9 million or 0.9 percent over the fiscal year 2018 request. The fiscal year 2019 budget request provides funding for 1,715 full-time equivalents for the effective program and project management and appropriate oversight of the nuclear security enterprise. Since 2010, NNSA's program funding has increased 50 percent, while staffing has decreased 10 percent. NNSA has partnered with the Office of Personnel Management to develop a staffing analysis, now in its second phase, of a Human Capital Management Plan that assesses current personnel levels compared to mission needs. The results of the staffing analysis will be used to inform future recommendations on appropriate staff size and provide the type and number of scientists, engineers, project managers, foreign affairs specialists, and support staff needed to accomplish the mission. Part of the evaluation includes a review of current staff skill sets and areas where skills are needed for

project and program management, applicable oversight, and day to day operations of the nuclear security enterprise.

Thanks to the support of Congress, NNSA received a 10-year extension to continue to use the Demonstration Project personnel system. The pay for performance personnel system provides an important tool to retain and attract top talent for NNSA's national security missions. With the pay to perform personnel system, we are able to compete for personnel with other highly technical Federal and private organizations, motivate and retain high-performing employees, and deal with poor performers. NNSA uses the Demonstration Project in conjunction with the Excepted Service hiring authorities to hire key personnel for the current and next generation workforce with critical nuclear security expertise.

Management & Performance

Since 2011, NNSA has delivered approximately $1.4 billion in projects, a significant portion of NNSAs total project portfolio, 8 percent under original budget. This past February, the High Explosive Pressing Facility at Pantex achieved CD–4 and was completed $25 million under the approved baseline. We are committed to encouraging competition and increasing the universe of qualified contractors by streamlining major acquisition processes. NNSA will continue to focus on delivering timely, best-value acquisition solutions for all programs and projects, by using a tailored approach to contract structures and incentives that is appropriate for the special missions and risks at each site. The Office of Acquisition and Project Management continues to lead improvements in contract and project management practices; provide clear lines of authority and accountability for program and project managers; 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.

Conclusion

NNSA's diverse and enduring national security missions are crucial to the security of the United States, the defense of its allies and partners, and global stability. The U.S. nuclear deterrent has and will continue to remain the cornerstone of America's national security, and NNSA has unique responsibilities to maintain and certify the continued safety, security, reliability, and effectiveness of that nuclear deterrent.

Nuclear nonproliferation and nuclear counterterrorism activities are essential to promoting the peaceful use of nuclear energy and preventing malicious use of nuclear and radiological materials and technology around the world. Providing naval nuclear propulsion to the U.S. Navy is crucial to the United States to defend interests abroad and protect the world's commercial shipping lanes. Each of these critical missions depends upon NNSA's capabilities, facilities, infrastructure, and world-class workforce.

Senator ALEXANDER. And now we will move to our first round of 5 minute questions.

Mr. Secretary, you began talking about exascale computing. When I first came to the Senate, Senator Bingaman, for whom I had a lot of respect, was chairman of the energy committee and he encouraged me to go to Japan to see their computer. I think it was the earth simulator, if I remember right.

So I flew all the way to Yokohama and it was just a big box was all I could see. I probably could have taken a picture of it. But it gave me a sense of the importance of it because he thought it was important. So since then, and that was 10, 15 years ago, we have had bipartisan support to try to maintain for our country leadership in supercomputing and we have over that time different administrations have reorganized our computing effort, provided what we call leadership computing. And now we are moving, as you just described, to a new phase of what we call Exascale computing. When will that happen and when will we see that? And what will the benefits be to our country for that?

Secretary PERRY. Mr. Chairman, the Office of Science has been working very closely with our leadership on the computing facilities and the Exascale, and as you appropriately pointed out, we are

shooting for 2021. You asked for specificity, a date. And 2021 there's $140 million that will be designated for Argon. There's $100 million for Oak Ridge and those leadership computing facilities. And that's monies to support nonrecurring engineering efforts and site preparation for the activities and for the Exascale computing project to maintain the planned schedule.

So 2021 at Argon and then 2022 at Oak Ridge. And as you and I have talked about the Oak Ridge architecture is different than the Argon, but, again, this will give us, put us back into quite a substantially better position, let me put it that way. We will have the fastest computer in the world for a period of time. But this is a competition that goes on every day and our friends in China and elsewhere are very capable.

So but we recently laid out a request for proposal for at least two Exascale computers, as I've said. So those are in the works. Those $1.8 billion total RFP.

Senator ALEXANDER. Thank you.

Let me ask Ms. Gordon-Hagerty about the uranium facility. Senator Feinstein and I worked together over the last half dozen years I guess to try to, because of our concern about cost overruns on the NNSA large construction projects and our most successful effort, I think, was to, as a result of two things, one was a red team that focused attention on the uranium facility and secondly, regular meetings with the person on the flagpole, the person in charge, to see whether the project was on time and on budget.

Now, you have said that the project, and we also required that construction be 90 percent designed before construction began. So that's all worked pretty well and we have got a number and a year. You authorized that the uranium facility go ahead.

Are you confident that we are on time and on budget and are you willing to continue to work with Senator Feinstein and me, meet with us every 6 months or so, to give us a report and to let us know if there's any variation in that on time and on budget prediction?

Ms. GORDON-HAGERTY. Yes, Mr. Chairman, I'm absolutely committed to working with you and Senator Feinstein and the members of the committee every 6 months or so, as I had promised in our meeting earlier this week. More importantly I can say confidently at present time we are committed to delivering the Uranium Processing Facility at Oak Ridge National Lab—at Y–12 in Oak Ridge on time and on schedule, which is by the end of 2025 at a cost of not more than $6.5 billion.

Senator ALEXANDER. And am I correct that you did not authorize construction until design was 90 percent completed?

Ms. GORDON-HAGERTY. That is correct and we just recently have made the recommendation to the Deputy Secretary and he agreed just last month that we would go to see CD–123.

Senator ALEXANDER. Do you think that's a reasonable model for other large scale construction projects?

Ms. GORDON-HAGERTY. Yes, sir. And I can tell you that during my short tenure here at the NNSA, Department of Energy, NNSA, we've talked much about using that model and I believe that the NNSA has made significant improvements in infrastructure.

Senator ALEXANDER. Well, I'd like to thank Senator Feinstein actually for her role in this because I think this is one case where Senate oversight of a large spending project made a real, made a real difference.

Senator FEINSTEIN. Maybe the first one.

Senator ALEXANDER. Hopefully not the last.

Senator Feinstein.

Senator FEINSTEIN. I would like to ask a question about ITER (International Thermonuclear Experimental Reactor) because I had the privilege of meeting the new director and we have had some concern about the funding and it's my understanding that the administration has not taken a position on our continued involvement. The department was supposed to address that question in the fiscal year 2019 budget, but it didn't. And all we have is a request for $75 million and an acknowledgment that a decision needs to be made.

If the United States is going to retain a partner in ITER then funding in fiscal year 2019 should be roughly $200 million or more in order to maintain cost and schedule. Of course when we cut it back, I then saw all the American projects that were involved in it which used up the money essentially of our contribution.

And so clearly there is American involvement and American jobs. Whether ITER can ever be successful or not I think is still unknown and I don't know, Mr. Secretary, if you've had a chance to take a good look at it, but even if you haven't, if there are some views you have that you can share with us it would be appreciated.

Secretary PERRY. Senator, I have had the opportunity to take a look at it. We visited with the new executive director. We have had some fairly extensive conversations about it. I, like you, don't know whether or not this will be a successful scientific project or not, but we also realize that for the future of energy we are going to be, we are going to be traveling down some roads from time-to-time that we don't know what the destination may look like that we are trying to get to and I know that sounds a bit vague, but the fact is on this project that may be one of those.

With that said, there are some projects U.S. manufacturers that are involved with that. We have still committed to funding their efforts. There's a California project. I think its General Atomics that is building a part of that project and they've been clearly sent the message that the funding is going to continue on there.

Overall, from a high level view, we are currently carrying out a very high level review of nuclear energy related activities and it ITER is obviously on that list.

Senator FEINSTEIN. What do your people say about it? Under the new management, what I'm told is, well, it's much better. But I don't know what the chances are that we reach fusion.

Secretary PERRY. Paul, would you like to take a shot at your fusion, put your fusion goggles on?

Mr. DABBAR. So it is our opinion that Director General Bigot who took over as head of the ITER project has certainly got a good handle on the project management and the delivery from all the different countries, including our own, and coordinating that much better than previously.

However, the overall project cost had moved from about $11 billion to $65 billion in our estimate. So, as you know, it's a very large amount of money and that's just, that's just a construction cost. There's also operating costs going forward after it's in operation. And in general we have a 9.09 percent part of that. So we have—

Senator FEINSTEIN. So 9 percent that Chairman just asked how much of that is our money.

Mr. DABBAR. It's about $6.4 billion in construction plus a proportional share of operations after it starts operation in 2025 ramping up to 2035 is the final operations step up. So it is a lot of money.

We, as the Secretary said, we are still evaluating it. Last year the 2018 Omni, there were two particular components that were in kind so being constructed here in the United States or delivering U.S. made components. One is by General Atomics on the central solenoid and they also funded the other component, which was a cooling water system. Our budget here proposes to fund the General Atomics central solenoid in the 2019 budget as we continue to evaluate our options under the agreement and around the science, given the cost.

Senator FEINSTEIN. This is hard, I know. Can you estimate when a correct judgment might be made?

Mr. DABBAR. So we think that the cost estimates are reasonably, they are coming out of the ITER organization are pretty reasonable right now. And so what we are trying to evaluate is really the budgetary impact to the department to continue that, to recommend whether the appropriators might recommend funding it going forward or if there's something else that we should be doing around our involvement in the project.

Senator FEINSTEIN. Yes. So just one thing, will we know before we markup?

Senator ALEXANDER. Doesn't sound like it. Well, we can talk more about this. We have had a lot of discussions about this and we are very interested in your judgment and your evaluation.

Senator FEINSTEIN. Yes.

Senator ALEXANDER. Before we markup. We want your best judgment before we markup.

Senator FEINSTEIN. That's right.

Senator ALEXANDER. Thank you, Senator Feinstein.

Senator Kennedy.

Senator KENNEDY. Thank you, Mr. Chairman.

Mr. Secretary, and your colleagues, welcome. I can remember a time, Mr. Secretary, I know you can too, when we imported liquefied natural gas and now we are exporting it I think to 27 different countries. One of which is Mexico.

Can you or your colleagues enlighten me a little bit about how our NAFTA (North American Free Trade Agreement) negotiations may impact that export of natural gas to our friends in Mexico?

Secretary PERRY. I'll give you my best shot at it and Senator, as you may or may not know, in the early 1990s I was a part of the NAFTA, the original NAFTA agreement. I think my title was the, I was on the intergovernmental policy advisory committee. And the longer your title is the less influence you have. So I had a pretty long name, but I was on the agricultural sector. I was the Ag commissioner in the State of Texas at that particular point in time.

And what we found was that there was a, you know, this was a, it turned out from my perspective to be a really good agreement. Twenty-five years later it's time to renegotiate the contract. The world has changed. Energy is probably the biggest factor in that.

I feel comfortable. I'm not engaged directly in these negotiations. Ambassador Lighthizer has got that. The President has got that.

But I feel very confident we are going to get a deal. As I told the Ambassador, get a deal, get a good deal, but get a deal. We need this. We need this partly because it's in the best interests of the United States to have this agreement with Mexico.

I think that the potential with Mexico, and particularly in the energy sector, is one of the great bright lights in Mexico. If you want to see that country's economic arrow pointed in the right direction obviously energy is going to be right at the center of that, whether it's allowing U.S. companies to help E&P, whether it's the pipeline side of it. I think all the way downstream to being able to build a refining and chemical industry in Mexico as well. So I think the opportunities are extraordinary. Getting a NAFTA deal is really important.

Senator KENNEDY. I'd like to get your thoughts and the thoughts of your colleagues too, just in general about the changes in America in terms of energy and our mix of energy. Obviously we have been long-time dependent on oil. We are producing more of our own oil now.

Secretary PERRY. Yes, sir.

Senator KENNEDY. Where do you see the mix of America's sources of energy in say the next 10 years in terms of nuclear, coal, natural gas, solar, wind, and then I want to talk a little bit about battery technology.

Secretary PERRY. I'll try to be brief here.

Senator KENNEDY. That's okay.

Secretary PERRY. We are going to be in all of the above—country—I think for us to not be all of the above—you mentioned all of them and hydro—all of those are going to be, I think, inextricably intertwined to the American economy as we go forward.

If we don't have all of those and that's the reason that coal and nuclear both have to be brought back into the mix, if you will. The previous Administration made both of those industries, from my perspective, difficult for them to be viable in the market. I think it's very important for this country to try to put rules and regulations into place where all forms of energy—our renewables are going to continue to grow.

You know, in my home State of Texas we developed more wind energy than any other State in the Nation over the last decade.

Senator KENNEDY. Secretary, can I stop you just one second?

Secretary PERRY. Yes, sir.

Senator KENNEDY. Because I'm about to run out of time.

Secretary PERRY. Okay.

Senator KENNEDY. I did want to ask you one other question. I worry that China is beating our brains out in terms of battery technology. Do you have any thoughts on that?

Secretary PERRY. Well, listen, China is a heck of a competitor.

Senator KENNEDY. Yes.

Secretary PERRY. And we have got to be on our A game when we come. I happen to think that the National Labs and our investment in our National Labs are what are going to keep us in the game on battery storage.

I believe battery storage is the holy grail of the energy side of things going forward, particularly on the renewable side. And we are working and making good progress. PNNL (Pacific Northwest National Laboratory) out in Senator Murray's, that they are doing some fabulous work on batteries and battery storage.

And I will suggest to you the answers will be found in our universities and our National Labs working together on battery storage.

Senator KENNEDY. Thank you, Mr. Secretary.

Secretary PERRY. Yes, sir.

Senator KENNEDY. Do you miss being governor?

Secretary PERRY. It was the best job I ever had. But this one is the most interesting job I've ever had.

Senator KENNEDY. It's not dull, is it?

Secretary PERRY. This is a consequential job.

Senator ALEXANDER. Thank you, Senator Kennedy.

Secretary PERRY. Isn't that right?

Senator KENNEDY. Senator Shaheen, do you miss being governor?

Senator SHAHEEN. Everyday. How about you?

Senator KENNEDY. And getting more so.

Senator SHAHEEN. That's right.

Mr. Secretary, and all of the panelists here, thank you very much for being here today and for taking on the challenging responsibilities that you have.

I notice that there have been a lot of energy sources mentioned today, but the one thing that hasn't been mentioned is energy efficiency. And I was disappointed to see that the President's budget cut the Office of Energy Efficiency and Renewable Energy by more than 65 percent. That when energy efficiency is the number one job creator within the clean energy economy and accounts for three out of four American clean energy jobs, employs about 2.2 million Americans.

And in fact, according to the American Council for an Energy Efficient Economy, over the last 40 years energy efficiency has contributed more to our Nation's energy needs than any other fuel source saving Americans about $800 billion during that time period.

So, I wonder, Mr. Secretary, if you could explain to us why we should cut support for critical energy efficiency programs when they have made such a difference to our economy and to our energy needs.

Secretary PERRY. Senator, I'll attempt to give you my observations about what we have done on our budget so that I think from my perspective, we have, that budget may be a little misleading from the standpoint of the restructuring that we did over on that side of the house notwithstanding, you know, our 2019 request for EERE (Energy Efficiency and Renewable Energy). I think we got almost $700 million to maintain America's leadership in the transformative science and emerging energy technologies.

We transitioned to early stage—one of the things I found as governor was that once technologies get mature that they will either make it or they won't out in the marketplace. And you know, we believe our role is more in the early stage side and so we transition over to the early stage side of this and——

Senator SHAHEEN. I'm sorry to interrupt, Mr. Secretary, my time is running. And so I just want to, I appreciate that that's a view of the Department of Energy. I would argue that that doesn't seem to be our view with respect to fossil fuels like oil and gas and nuclear, and also nuclear power which we have been supporting and subsidizing for decades in this country.

So, again, maybe we could submit for the record so you can share with me in more detail——

Secretary PERRY. Yes, ma'am.

Senator SHAHEEN [continuing]. Your view on that because I wanted to get to another issue before my time is up.

At least twice in 2017 programs that are under the jurisdiction of this subcommittee have seen confusion around timing and delays, particularly with respect to the DOE violating the Congressional Budget and Impoundment Control Act by withholding appropriated funds for ARPA–E around weatherization.

I have a letter here, Mr. Chairman, which I would like to submit for the record from the Government Accountability Office, which was released in February that talks about how this impoundment lead to lost jobs and disruption to the competitive prospect of several ARPA–E projects.

Senator ALEXANDER. So ordered.

[The information follows:]

GAO U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

B-329092

December 12, 2017

Congressional Committees

Subject: *Impoundment of the Advanced Research Projects Agency-Energy Appropriation Resulting from Legislative Proposals in the President's Budget Request for Fiscal Year 2018*

This letter is to inform you of an impoundment in the Advanced Research Projects Agency-Energy (ARPA-E) appropriation in fiscal year (FY) 2017. As explained in more detail below, ARPA-E withheld from obligation $91 million of budget authority in violation of the Impoundment Control Act. *See* Pub. L. No. 93–344, title X, §§ 1001–1017, 88 Stat. 297, 332 (July 12, 1974), *classified at* 2 U.S.C. §§ 681–688. Since we have confirmed that the funds have been made available for obligation, we are not transmitting a report under the Impoundment Control Act because the impoundment is no longer taking place.

On May 23, President Trump submitted his budget request for FY 2018 to Congress. The budget request proposes the elimination of ARPA-E, an agency within the Department of Energy. The budget request asks that Congress cancel $46.367 million of ARPA-E's unobligated balances and require that another $45 million of ARPA-E's unobligated balances be used for "program direction,"[1] which will be used "to ensure full closure of ARPA-E by mid-2019."[2] In September, we received an inquiry about the status of these amounts.[3] We contacted ARPA-E

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[1] *Appendix, Budget of the United States Government for Fiscal Year 2018* (May 23, 2017), at 380–81, *available at* www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/doe.pdf (last visited Dec. 11, 2017).

[2] *2018 Major Savings and Reforms, Budget of the United States Government for Fiscal Year 2018* (May 23, 2017), at 33, *available at* www.whitehouse.gov/sites/whitehouse.gov/files/omb/budget/fy2018/msar.pdf (last visited Dec. 11, 2017).

[3] GAO is also currently conducting an audit engagement related to the Department of Energy's review of ARPA-E's funding opportunity announcements.

officials who told us that, per the Department of Energy's instructions, ARPA-E was withholding the obligation of more than $91 million of budget authority in anticipation of congressional enactment of the legislative proposals in the budget request. We conclude that this withholding violated the Impoundment Control Act. The Department of Energy recently acknowledged that while ARPA-E's appropriation was fully apportioned and allotted in FY 2017, "limited oral conversations regarding whether to withhold any budget authority in the ARPA-E appropriation during FY 2017 pursuant to the FY 2018 President's Budget did occur." Letter from Acting General Counsel, Department of Energy, to Managing Associate General Counsel, GAO (Nov. 29, 2017).

All funds impounded in response to the President's budget request have been released. The Department of Energy provided us with an FY 2018 apportionment schedule and allotment record, showing that all of ARPA-E's unobligated balances, carried forward from previous fiscal years, are currently available for obligation. ARPA-E officials also orally confirmed that such budget authority is now available.

Background on the Impoundment Control Act

The Impoundment Control Act operates on the premise that when Congress appropriates money to the executive branch, the President is required to obligate the funds. *See* 2 U.S.C. §§ 681–688; B-203057, Sept. 15, 1981.[4] In other words, an agency must make funds available for obligation unless otherwise authorized to withhold. The act authorizes the President to impound, or withhold the obligation of funds, in certain circumstances.[5] The Impoundment Control Act separates

[4] *See also* U.S. Const. art. II, § 3, cl. 5 (the President "shall take care that the laws be faithfully executed"); *Train v. City of New York*, 420 U.S. 35 (1975) (President Nixon improperly directed the Administrator of the Environmental Protection Agency to allot to the states only about half of funds appropriated for water pollution assistance).

[5] The law includes this disclaimer: "Nothing contained in this Act, or in any amendments made by this Act, shall be construed as . . . superseding any provision of law which requires the obligation of budget authority or the making of outlays thereunder." 2 U.S.C. § 681(4). The Comptroller General and the federal courts have interpreted this disclaimer to mean that the President may not use the Impoundment Control Act to withhold funds for formula grants. GAO, *President's Eighth Special Message for Fiscal Year 1982*, OGC-82-9 (Washington, D.C.: Mar. 10, 1982) ("[T]he executive branch may not violate specific statutory requirements while it seeks to have Congress change those requirements"); GAO, *President's Eleventh Special Message for FY 1981*, OGC-81-14 (Washington, D.C.: July 30, 1981 (agency may not withhold mandatory grants to states pending congressional consideration of rescission proposal); *Maine v. Goldschmidt*, 494 F.Supp. 93 (D. Me. 1980) (lawsuit in response to President Carter's proposal to defer the obligation of grants to states under the Federal-Aid Highway Act).

impoundments into two exclusive categories—deferrals and rescissions. If the President wishes to temporarily postpone the obligation of budget authority, he may propose a deferral. 2 U.S.C. § 684. Deferrals are permissible only to provide for contingencies, to achieve savings made possible by or through changes in requirements or greater efficiency of operations, or as specifically provided by law. *Id.* § 684(b). Any amount of budget authority deferred must be prudently obligated before the end of the period of availability. *Id.*; 54 Comp. Gen. 453 (1974).[6]

If the President wants Congress to permanently cancel the availability of budget authority, he may propose a rescission. 2 U.S.C. § 683. A rescission may be proposed for any reason, including policy reasons. Any amount of budget authority proposed to be rescinded must be made available for obligation unless Congress, within 45 legislative days, completes action on a bill rescinding all or part of the amount proposed for rescission. *Id.* § 684(b).

The President notifies Congress of his proposed deferral or rescission by transmitting a "special message." The special message must describe, among other things, the amount of budget authority proposed for deferral or rescission, the relevant account and "specific project or governmental functions involved," the reasons why the budget authority should be deferred or rescinded, the "estimated fiscal, economic, and budgetary effect" of the proposed deferral or rescission, and any other "relevant facts, circumstances, and considerations." *Id.* §§ 683 (rescissions), 684 (deferrals).

The Comptroller General has a number of statutory responsibilities under the Impoundment Control Act. The Comptroller General is required to review each special message and report findings to Congress as soon as practicable. *Id.* § 685(b). The Comptroller General also ensures that the impoundment is not misclassified, such as a rescission proposal reported as a deferral. *Id.* § 686(b). In addition, if the Comptroller General becomes aware of an unreported impoundment, the Comptroller General must "make a report on such reserve or deferral and any available information concerning it to both Houses of Congress." *Id.* § 686(a).

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[6] Not all delays constitute a reportable impoundment under the Impoundment Control Act. Legitimate programmatic delays may occur when the agency is taking reasonable and necessary steps to implement a program, even though funds temporarily go unobligated. GAO, *Impoundment Control: Deferral of DOD Budget Authority Not Reported*, GAO/OGC-91-8 (Washington, D.C.: May 7, 1991), at 3–4; GAO, *Impoundment Control: President's Third Special Impoundment Message for FY 1990*, GAO/OGC-90-4, (Washington, D.C.: Mar. 6, 1990), at 9–10 (design modification); B-115398.51, Sept. 28, 1976 (low number of loan applications). Similarly, the Impoundment Control Act does not apply to delays or lapsing of budget authority resulting from ineffective program administration, unless there is "concrete evidence of an intent to withhold budget authority." B-229326, Aug. 29, 1989.

Since the enactment of the Impoundment Control Act, our practice has been to review withholdings brought to our attention by concerned Members or congressional committees, intended recipients, or auditors. *See, e.g.,* B-320091, July 23, 2010; GAO, *Comments on Unreported Impoundment of DOD Budget Authority*, GAO/OGC-92-11 (Washington, D.C.: June 3, 1992). In those situations, we review the agency's actions to determine if it has complied with the Impoundment Control Act and ultimately confirm that funds are made available for obligation.

Application to ARPA-E

ARPA-E historically receives an annual lump-sum, no-year appropriation for its programs. For instance, in FY 2017, ARPA-E received "$306,000,000, to remain available until expended" for "Department of Energy expenses necessary in carrying out the activities authorized by section 5012 of the America COMPETES Act (Public Law 110–69)." Pub. L. No. 115-31, div. D, title III, 131 Stat. 135, 312 (May 5, 2017). ARPA-E's lump-sum appropriation also historically includes a line-item for "program direction," an amount which is available for two fiscal years. *See, e.g., id.* ("*Provided*, That of such amount, $29,250,000 shall be available until September 30, 2018, for program direction").[7]

In mid-September, we received an inquiry about the status of $91 million of ARPA-E's unobligated balances—$46.367 million of which was proposed for cancellation and $45 million of which was proposed to be used for "full closure of ARPA-E by mid-2019" in the President's budget request.[8] We contacted ARPA-E officials, who told us that the Department of Energy had directed ARPA-E to withhold the obligation of all $91 million in anticipation of congressional enactment of such proposals. On September 28, we communicated our concerns to the Department of Energy's Office of General Counsel. On October 4, we sent a letter to the Acting General Counsel to seek additional facts and legal views from the Department of Energy. On November 29, after conducting a review and consulting with the Office of Management and Budget (OMB), the Acting General Counsel responded:

> "Our review found that all funds for that appropriation in FY 2017 were fully apportioned to DOE and fully allotted within DOE. Our review

[7] The Department of Energy explains that "[p]rogram direction funds are utilized for salaries and benefits of federal staff; travel; support services contracts to provide technical advice and project management assistance; and other related expenses, including the DOE Working Capital Fund." Department of Energy, *FY 2017 Congressional Budget Request*, vol. 4, at 415 (Feb. 2016), *available at* www.energy.gov/sites/prod/files/2016/02/f29/FY2017BudgetVolume%204.pdf (last visited Dec. 11, 2017).

[8] See notes1 and 2, *supra*.

> revealed that limited oral conversations regarding whether to withhold any budget authority in the ARPA-E appropriation during FY 2017 pursuant to the FY 2018 President's Budget did occur. Upon learning this, our office immediately apprised the relevant parties of the legal requirements of the Impoundment Control Act and the [OMB's] guidance on the same, contained in [C]ircular A-11, § 112.2. Those offices then took appropriate steps to be in compliance and have confirmed that all funds for this appropriation have been allotted in the current fiscal year, and that they are available for obligation."

Until the Department of Energy's Office of the General Counsel intervened, ARPA-E improperly withheld the obligation of budget authority in connection with the President's proposed elimination of ARPA-E and a so-called "cancellation proposal" in the President's budget request. OMB describes a cancellation proposal as "a proposal by the President to reduce budgetary resources that are not subject to the requirements of Title X of the Congressional Budget and Impoundment Control Act." OMB Circular No. A-11, *Preparation, Submission, and Execution of the Budget*, pt. 3, § 112.2 (July 2017), *available at* www.whitehouse.gov/sites/whitehouse.gov/files/omb/assets/a11_current_year/a11_2017.pdf (last visited Dec. 11, 2017). We have previously concluded that amounts withheld as a consequence of a "cancellation proposal" constitute impoundments that agencies may make only after the President transmits a special message to Congress under the Impoundment Control Act. B-308011, Aug. 4, 2006 (agency withheld $2 million from a no-year account for several months pending congressional action on a proposed cancellation in the President's budget request); B-307122, B-307122.2, Mar. 2, 2006 (agencies withheld over $470 million in budget authority, affecting 12 programs, for approximately two months pending congressional consideration of the President's proposed cancellations to offset Hurricane Katrina relief). OMB has reached a similar conclusion concerning the import of a cancellation proposal, instructing agencies that "[a]mounts proposed for cancellation are not to be withheld from obligation." OMB Circular No. A-11, pt. 3, § 112.2.

We note that the Impoundment Control Act applies to ARPA-E's funds despite the fact that they were made available without fiscal year limitation. The law applies by its express terms to all budget authority. 2 U.S.C. §§ 683 (rescission), 684 (deferral). *See also* GAO, *Deferral of SPR Budget Authority Not Reported to Congress*, GAO/OGC-83-11 (Washington, D.C.: May 5, 1983) (reporting a deferral of $800 million of no-year budget authority in the Strategic Petroleum Reserve account); B-200685, Dec. 23, 1980 (stating that any executive action or inaction is subject to the Impoundment Control Act "even if the budget authority involves no-year funds" and noting that "of the 132 deferrals and rescissions reported by the President during [FY] 1980, over half involved no-year funds"). Violations of the Impoundment Control Act hinge on whether the agency clearly intended to withhold

the obligation of budget authority. B-229326, Aug. 29, 1989.[9] ARPA-E stated that it deliberately withheld the obligation of $91 million in FY 2017, per the Department of Energy's instructions.

CONCLUSION

Agencies may only withhold budget authority from obligation if the President has transmitted a special message to Congress. 2 U.S.C. §§ 683 (rescission), 684 (deferral). ARPA-E withheld the obligation of $91 million without the President transmitting a special message to Congress. Accordingly, ARPA-E violated the Impoundment Control Act.

Since the purpose here is to ensure funds are made available for obligation and we have confirmed that the agency has done so, we are not transmitting a report to Congress under the Impoundment Control Act. In the past, we have declined to transmit a report to Congress under similar circumstances. *See* B-307122, B-307122.2. The Department of Energy's recent apportionment schedule and allotment record show that all of ARPA-E's unobligated balances from previous fiscal years are currently available for obligation. ARPA-E officials also orally confirmed that the budget authority is now available.

If you have any questions, please contact Julia C. Matta, Managing Associate General Counsel, at (202) 512-4023.

Sincerely,

Thomas H. Armstrong
General Counsel

[9] See note 6, *supra*.

List of Congressional Committees

The Honorable Lisa Murkowski
Chairman
The Honorable Maria Cantwell
Ranking Member
Committee on Energy and Natural Resources
United States Senate

The Honorable Lamar Alexander
Chairman
The Honorable Dianne Feinstein
Ranking Member
Subcommittee on Energy and Water Development
Committee on Appropriations
United States Senate

The Honorable Lamar Smith
Chairman
The Honorable Eddie Bernice Johnson
Ranking Member
Committee on Science, Space, and Technology
House of Representatives

The Honorable Mike Simpson
Chairman
The Honorable Marcy Kaptur
Ranking Member
Subcommittee on Energy and Water Development, and Related Agencies
Committee on Appropriations
House of Representatives

Senator SHAHEEN. And I just wondered what you have done to address the concerns raised in this GAO letter and what we might look for in the next budget year so that that does not happen again.

Secretary PERRY. Let me address ARPA–E. The Chairman and I have had pretty lengthy discussions about ARPA–E and the—one of the things I learned as an appropriator back in my days is that—and actually what I learned as governor was a better teacher for me than being an appropriator.

Appropriators do a lot of hard work and lay the budgets out and governors sometimes don't get to write those budgets or they write a budget and then they——

Senator SHAHEEN. I appreciate that.

Secretary PERRY. Anyway. So I respect what you do and I happen to—I know what my role is here and if this committee decides that they are going to fund ARPA–E at a certain level, I'm going to implement it and run it as efficiently and effectively as we can. So I hope that you know that we respect your right to write that budget and us to implement it.

Senator SHAHEEN. Again, another program that had similar issues was the Weatherization Assistance Program. So should we assume that any delays in funding that this committee has thought appropriate will—we will not see the same kind of issues in the upcoming budget year that we have seen in the last?

Secretary PERRY. We are going to follow the lead of this committee.

Senator SHAHEEN. Thank you.

Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Shaheen.

Senator Merkley.

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

And thank you, Mr. Secretary, for your testimony. You said a few moments ago that battery storage is a holy grail, did I catch that correctly?

Secretary PERRY. That's a quote, sir.

Senator MERKLEY. So the current account is funded at $41 million. As you reorganized you now have under the Office of Electricity Delivery $8 million for battery storage and that doesn't even sound like a research account.

So if it's the Holy Grail why are we going from $41 million to $8 million with that $8 million not even clearly dedicated to research?

Secretary PERRY. Senator, I think, you know, line item, pulling out one line item and saying this is all of the dollars that we are going to be focusing on a particular effort might be a little bit narrow in scope.

Senator MERKLEY. Well, okay. Well, let's have you follow-up and show us where else in the budget battery storage is. The reason we have these conversations is because you label things and we assume those labels are accurate.

Secretary PERRY. Yes, sir.

Senator MERKLEY. So if you have hidden the battery storage somewhere else then that's not helpful to us.

Secretary PERRY. Paul, would you——

Mr. DABBAR. Yes, Senator. So we have battery line items and funding in ARPA–E in the past and the Office of Science and EERE and in OE (Office of Electricity Delivery and Energy Reliability).

Senator MERKLEY. Okay. I'm just going to stop you there. One, because we have little time. But let me just point out ARPA–E has been reduced to zero in your budget. Now, so don't tell me about battery storage funding being in ARPA–E if you are zeroing out the account.

Mr. Secretary, if you believe that high risk, high return strategy is the appropriate role for government spending, and I think that's what I heard you say that you preferred to do it there then after you had mature technologies, then why are you cutting ARPA–E to zero?

Secretary PERRY. I think the 2018 budget has $48 million in it, Senator.

Senator MERKLEY. Well, we are here discussing the fiscal year 2019 budget, Mr. Secretary. It's the budget before us. That's the purpose of this hearing. Why are you cutting ARPA–E to zero?

Secretary PERRY. That's the, that's the budget that we are here to defend, sir.

Senator MERKLEY. Yes, well defend it. Why are you cutting it to zero?

Secretary PERRY. Well, I'll use the same, all the same rationale that I used a year ago when I said that I understand how the appropriations process works, the budget goes forward by the Administration and you all get to write it and then we will implement it.

Senator MERKLEY. I must say your responsibility to come here is to layout a vision for us and to explain that vision. I've just asked why your vision is that ARPA–E should be zero and you haven't answered the question.

Secretary PERRY. I am giving you the best answer I can give you, Senator.

Senator MERKLEY. Okay. Well, let's turn to the sale of Bonneville. Why do you want to sell Bonneville power?

Secretary PERRY. I'm not going to tell you that that is—that is an idea that's been laid out on the table for a discussion and——

Senator MERKLEY. So it's not your recommendation that it be sold?

Secretary PERRY. I would suggest to you it's a concept that's laid out on the table for conversation.

Senator MERKLEY. So are you laying out that concept saying that the People who buy it can decide what price to sell the transmission services that they acquire?

Secretary PERRY. I'm saying that, you know, let's have a conversation, talk about what's the good, what's the bad, how is it——

Senator MERKLEY. Okay.

Secretary PERRY [continuing]. Affect the——

Senator MERKLEY. Well, so let me give you my opinion. It's the most horrific idea we have heard in the Northwest ever and take it off the table and if you don't have a detailed description of how you are planning to do it and a way to defend it then don't keep delivering the same bad ideas up here to Capitol Hill.

You will find the Northwest legislators will lay down on the tracks to make sure that we don't sell off the ability to have reasonable, renewable power and this is our rural cooperatives. They were here this week on Capitol Hill saying how the heck, why is the Administration proceeding to sell us out by selling Bonneville.

I couldn't answer them, but I told them, you know, I'm going to find out from the Secretary and I'm trying to find out now.

Secretary PERRY. Well, here's one of the things I would tell them is that the recommendation, the best I recall wasn't to sell Bonneville, it was to sell the transmission lines.

Senator MERKLEY. It is to sell the transmission assets. That is correct and that's what I'm asking about.

Secretary PERRY. And again, I will say, let's have the conversation. But what you were making the argument about is that we are going to sell Bonneville and that's not correct.

Senator MERKLEY. Bonneville transmission assets.

Secretary PERRY. The Bonneville transmission lines.

Senator MERKLEY. That's right. And I asked you specifically are you going to, when people buy the transmission lines, allow them to set the price for the use of those lines.

Secretary PERRY. It's a good conversation to have.

Senator MERKLEY. Okay. It's a bad idea.

Secretary PERRY. Show me the economics of it one way or the other.

Senator MERKLEY. Let's put a stake through the heart of that, through the heart of that conversation. I want to turn to the same topic my colleague mentioned in terms of energy efficiency and renewable energy because when Mark Menezes, your Under Secretary, explained why the cuts should occur, he said accomplishments have been made in these programs. And you mention that you prefer early technology rather than late technology.

So why would you proceed on something that's on a fast curve of technological transformation where we are in direct competition with the rest of the world? Why would we undermine that effort while you are increasing the funding for age old fossil fuel research?

Secretary PERRY. And you're asking about the weatherization program?

Senator MERKLEY. No. No. No, EERE.

Secretary PERRY. EERE.

Senator MERKLEY. Yes.

Secretary PERRY. And we talked about early stage and those becoming mature and going on——

Senator MERKLEY. Those technologies are not mature yet, they are changing dramatically year-after-year, just like you mentioned on battery technology.

Secretary PERRY. I will suggest to you——

Senator MERKLEY. Okay. I'm out of time, but thank you very much.

Senator ALEXANDER. Thank you, Senator Merkley.

Senator Hoeven.

Senator HOEVEN. Governor Secretary Perry, it's an honor to see you.

Secretary PERRY. Yes, sir.

Senator HOEVEN. Hope you are doing well. Hope you are enjoying the job. Thanks for being here today. Appreciate it.

We need to get you out to North Dakota to see some of the really innovative stuff that we are doing both at the Energy & Environmental Research Center and at Dakota Gasification where we are

not only converting coal into liquefied natural gas, we are capturing CO_2 and sending it out to the oil fields and putting it down whole. Similar to what Denver is doing down in your State, except that we are using it for singular oil recovery instead of just sequestration and now they have built a half a billion dollar fertilizer plant that they are going to run with that natural gas.

So it would be really great to have you come out and see those things and I think you'd really enjoy it. And weather is warming up a little and I know you being from Texas like that. So we would love to have you come.

Secretary PERRY. Yes, sir.

Senator HOEVEN. Is that yes, sir in the affirmative?

Secretary PERRY. Yes, sir, in the affirmative.

Senator HOEVEN. That's good.

Now let's talk about your support for some of this fossil energy research and development. Project Tundra is a project we have where we are putting actual scrubbers on the back end that capture CO_2 on existing plants for sequestration and in the Alum cycle is the technology where we would actually build a plant. You've got one in Petra Nova I think in Houston.

Secretary PERRY. Yes, sir.

Senator HOEVEN. And we have both our State and the industry collaborating. We have gotten some funding already out of DOE. Got $6 million last year to get these underway and I would like to just have you talk about your commitment to that technology and helping to develop it.

Secretary PERRY. Yes, sir.

Senator HOEVEN. Unless you want to talk about Bonneville power some more. It's up to you. I mean, I'd give you the choice.

Secretary PERRY. No. That's kind. Thank you.

I think we beat that horse. We beat that horse about as much as we want to beat it.

Senator HOEVEN. Senator Murray might——

Secretary PERRY. I got the message. The stake is in my hand.

So the technology that we are seeing brought forward on clean coal, carbon capture, utilization (CCU) is starting to take off across the globe and I think that's one of the most important things about this is that I'm leaving Friday for India. We will be talking to them about not only their continued growth in the innovation side of things buying U.S. technology. CCU will be part of that that we talk to them about. So the potential for U.S. technology to be delivered and deployed across the globe, particularly into those countries that are going to continue to use coal.

Senator HOEVEN. Right.

Secretary PERRY. By 2040 77 percent of all the energy produced in the world is still going to be produced by fossil fuels. I mean that's a fact.

We want it to be U.S. based resources as often as possible, but we also want it to be clean burning as it can be and that's where the CCUS (carbon capture, utilization, and storage) and the technology that's ongoing at these projects, like you have in your home State and we are working on at our labs.

Senator HOEVEN. Yes. And this is the real solution. It's not over-regulation. It's this technology and innovation is the real solution. No question about it.

And just like we have done with Sox, Knox and Mercury we are making progress on this and we will find a way not just to make it technologically feasible, but commercially viable. That's it, commercially viable is where we have to get to.

Secretary PERRY. Yes, sir.

Senator HOEVEN. We really appreciate it. I know you get it and I appreciate your help on it. I'm glad to hear you are going over to India, China, and those kind of places obviously. We will adapt that technology. They will buy it from us as we develop it.

Secretary PERRY. They will indeed.

Senator HOEVEN. And then I want to shift to you, Ms. Gordon-Hagerty. Talk to me about the W80–4 refurbishment, you know, which is the, you know, the new cruise missile, long-reach standoff missile. We need your work on that project to stay on track.

And so just talk to me about how you're going to get on our timeline and stay on our timeline because, you know, we need that new technology to defeat our enemies' defensive systems if we are going to continue to be, you know, capable militarily of doing that. And that's what that timeline is all about is making sure we stay ahead of their defenses. So please talk to me how we are going to stay on track with that.

Ms. GORDON-HAGERTY. Yes, Senator. Thank you for the question.

We actually are on track and on timeline right now and we are aligning our program with the U.S. Air Force and basically, with consistent and reliable funding we will be able to align our programs with the Air Force and continue to do so. And this is our, it's a heavy lift for us, but we certainly are on track, as we are with all of our other major, our major alt and our three LEPs (life extension programs) that we have currently undergoing.

Senator HOEVEN. And it absolutely aligns with the Administration's goal.

Ms. GORDON-HAGERTY. Absolutely. Yes, it does.

Senator HOEVEN. And Secretary Perry, also just ask for your continued support for our cooperative agreements with the Energy & Environment Research Center at the University of North Dakota on—the Colton.

Secretary PERRY. Yes, sir.

Senator HOEVEN. Thank you again to all of you. Appreciate you being here.

Secretary PERRY. Thank you, Governor.

Senator ALEXANDER. Thank you, Senator Hoeven.

Senator Murray.

Senator MURRAY. Thank you very much, Mr. Chairman. And thank you, you and Senator Feinstein, for your tremendous work on the 2018 omnibus bill. It rejected bad policies and put good investments in place for my State and the entire Country. We appreciate it.

On BPA (Bonneville Power Administration), what Senator Merkley said. Stake in it, Mr. Chairman—Mr. Secretary. What Senator Merkley said, I agree too, we cannot privatize the transmission lines. Absolutely opposed to it. I think you heard us.

Secretary PERRY. Not only today but before.

Senator MURRAY. Okay. Well, let me really focus on the Hanford site, as I'm sure you knew I would.

Last year you told me that DOE supports completing the low-activity waste facility and hot commissioning by December, 2023. And I appreciate your efforts to try and accelerate that work.

It has become abundantly clear that reaching this court mandated deadline sooner comes at the expense now of the rest of the waste treatment plant. DOE just spent years resolving the technical issues and the high-level waste facility is ready to resume design, engineering and procurement and technical issues resolution for the pretreatment facility is nearly complete.

So now is not the time to take our foot off the gas. In fact, the recently enacted spending bill that we just approved provides $75 million for the high-level waste facility and prevents DOE from initiating any changes without proper and detailed justification.

So let me ask you, Mr. Secretary, has DOE made a decision to place the high-level waste facility and/or the pretreatment facility into an extended preservation mode?

Secretary PERRY. We have not.

Senator MURRAY. You have not. Well, I'm worried because, from the looks of it, your proposed budget reflects a decision only providing funding for, "configuration management of design and procurement documents," for both facilities.

So will your budget allow for any work other than preserving or maintaining the existing structure?

Secretary PERRY. Senator, I think the study still goes on about how to get that back online. Our focus and what we talked to Bechtel about was to get the DFLAW (direct-feed low activity waste) program, get it up and working where we can get the, you know, get the waste treated and start it heading off of that facility.

Senator MURRAY. Okay. Well, will you follow Congressional direction and move forward with the design and engineering work on the high-level waste facility?

Secretary PERRY. Senator, I will follow your direction—

Senator MURRAY. Okay.

Secretary PERRY [continuing]. And the committee and the Senate.

Senator MURRAY. Okay. I would be remiss if I didn't remind you that I have been asking you and DOE at all levels for more information on your proposals for Hanford's tank waste treatment mission.

I am still waiting for answers and clarity and I just want you to know I'm not going to support any proposals until we get a thorough review and analysis to Congress and to the State of Washington and to the Tri-Cities Community because DOE has a legal and a moral obligation to meet those Hanford cleanup responsibilities.

Secretary PERRY. Senator, I think you know that C Farm is at—we are going to be able to make an announcement about C Farm and about cleaning up C Farm that hasn't been done in the past. So I look forward to coming out——

Senator MURRAY. And you'll give details of that?

Secretary PERRY [continuing]. And making that announcement with you in the not too distant future.

Senator MURRAY. Okay. I want to follow-up on Senator Shaheen's concern because, as she talked about, and I'm worried about, President Trump's budget for DOE fails to make the necessary investments in science and engineering to make sure that we, as United States, continue our global leadership.

Our national labs, you've called them the crown jewels, would be forced to let go of thousands of scientists and engineers under your budget and that loss of knowledge and experience would be just staggering. So I'm really grateful actually for the strong support within this subcommittee for EERE programs that support critical research and development, as Senator Shaheen talked about, for energy efficiency, renewable energy, alternative transportation. In fact, provided a historic $2.3 billion in the recent bill.

Your budget proposed a fraction of that. It would be a 70 percent cut which would have significant impacts to our national labs, including PNNL (Pacific Northwest National Laboratory) in my home State and universities and our industry partners. So I am really worried about that and wanted to ask you why your budget doesn't support the EER programs.

Secretary PERRY. Senator, I disagree with that analysis that we don't support the sciences and what have you. What we are looking at is, I think, a difference in line items.

We are standing up an Office of Cybersecurity with a pretty substantial increase in that budget alone. So I don't see, and I'll go back and reiterate this issue of we are focusing on early stage, not more mature technologies. And I think as you have seen these dollars being shifted around that's where, you know, that's where the criticism comes is that it appears that, you know, we are not following the old line item, we are not following the old budgetary restrictions if you will.

Senator MURRAY. Well, just understand that if we were to enact the budget as you sent it it would have a severe impact, a severe cut to our national labs.

Okay. Thank you, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Murray.

Senator Udall.

Senator UDALL. Thank you, Chairman Alexander, and thank you for your leadership on this subcommittee.

Secretary Perry, it's good to see you and I want to thank you for taking the time to speak to us about the NNSA budget and also I see the Administrator here.

Secretary PERRY. Yes, sir.

Senator UDALL. So I have a couple of questions I think for you.

I'm very happy to see you made a whirlwind visit into New Mexico and Los Alamos National Lab and meeting with some of those best and brightest scientists we have there.

One of the most important missions facing DOE and our country today is the plutonium mission. That is a challenging endeavor and there is only one place in the U.S. with the technical know-how to do this and that is the Los Alamos National Laboratory.

As you know I'm concerned about the DOE analysis of alternatives and the process that has been undertaken to determine the

host for the plutonium mission. That DOE analysis ignored the Nuclear Weapons Council, DOE's own cost office, and Congressional direction, which have all pointed DOE towards the modular approach at Los Alamos.

And this question is to both of you, will you continue to ensure that this mission is based on science and security requirements, not politics, and that the modular approach at Los Alamos is fully considered in the analysis of alternatives?

Secretary PERRY. Yes, sir. And Senator, you know, that the commitment——

Senator UDALL. If you want to just say yes, that's great.

Secretary PERRY. Yes, sir.

Senator UDALL. Yes.

Secretary PERRY. Yes, sir. And stop right there.

Senator UDALL. And Madam Administrator.

Ms. GORDON-HAGERTY. Yes.

Senator UDALL. Okay. We are going to hold you to that. As you know, you and I have visited several times about this——

Secretary PERRY. Yes, sir.

Senator UDALL [continuing]. And we really hope that we focus on specifically what I just talked about there.

When asked about cleanup during your visit to Los Alamos last year you stated, and these are the quotes I believe publicly, I want to get things done. I'm a realist. I realize we are not going to clean it up overnight. We are going to make progress.

We appreciate that and I was pleased the budget agreement enabled the subcommittee to devote more resources to cleanup at Los Alamos. We will be looking to do so again in 2019.

Going forward we have a new, stand alone cleanup contract there and I believe the transition needs to be successful.

Will you direct DOE's Office of Environmental Management to do everything in their power to ensure a smooth transition for that contract so that we do make progress and do not face a slow down as we transition from one contractor to another?

Secretary PERRY. Yes, sir.

Senator UDALL. Thank you.

And this is I think to both of you. There are some new nuclear missions that have been proposed in this budget and the Nuclear Posture Review. I'm concerned, however, that these new missions could end up taking away money from the existing stockpile stewardship program and divert attention from the life extension programs that are already on a tight timeline. Like many Americans, I'm concerned about the proliferation of nuclear weapons and the last thing we need are new arms races around the world.

Do you agree that our effort to complete the existing stockpile stewardship program on time and at the best price for the taxpayer cannot afford to be distracted by new nuclear missions?

Secretary PERRY. Yes, sir.

Senator UDALL. You.

Ms. GORDON-HAGERTY. Sir, I'm confident that we are on schedule and within budget for our three life extension programs and our ongoing major alt to the W88.

Senator UDALL. As you all know, and I know Senator Alexander knows, that was a big, the moving forward on the modernization

was a big bipartisan effort that was put together in the last administration, had very good, strong bipartisan support on both sides.

The clearance backlog is impacting everyone in the national security space. We are pleased that DOE has put in place some teams to help address this, but it will take time to work through.

Will you continue to direct the resources necessary to reduce the time for clearances while maintaining standards?

Secretary PERRY. Yes, sir.

Senator UDALL. Thank you very much. There are many individuals in New Mexico and elsewhere who are anxious and willing to contribute to this important national security mission and when they have to wait a year or more for a clearance there's a clear disincentive for them to work at the labs versus a private facility, which in many cases may pay more than a government job. So I hope you really work on that clearance issue.

And please, I know this is something that the Chairman is concerned about and many members of this committee. Let us know what we can do, if we can move that process along to make you all more effective and achieve your missions.

Thank you very much, Mr. Chairman.

Senator ALEXANDER. Thank you, Senator Udall. And thanks for your active participation in the subcommittee.

Mr. Secretary, I just have a couple of more points. This, I didn't want to interrupt while the Bonneville Senators were speaking, but there's a thing called TVA, which is in Tennessee, and there is some gremlin over in the Office of Management & Budget that through every President somehow this gremlin makes his way up through the floor and gets into some budget proposal the proposal to sell either Bonneville or TVA or the transmission assets.

And my hope would be that somebody would find that gremlin and lock him in a closet and that the Administration would focus its attention on other, other issues. And I don't need for you to respond to that.

Let me ask you about ARPA–E. You and I have had a lot of discussions about it. And I do appreciate the fact that you recognize that the budget may recommend one thing, we may decide another. And in the case of ARPA–E, as we have discussed, that was the result of the rising above of the gathering storm proposal by a distinguished group of Americans. It was the hope that over time it would do for energy what DARPA (Defense Advanced Research Projects Agency) had done for defense, or something like that. And it's off to a good start. So we have funded it.

One of the areas where I've always been hopeful. And you mentioned the words, Holy Grail. I've always thought the Holy Grail for energy was to find, to use your words, a commercially viable carbon recapture.

I'm not so optimistic about the projects we have so far. They are expensive. They don't work as well as we would like and they have a hard time competing in the marketplace with other forms of energy.

But if we can find a way to reuse carbon, to recycle carbon, somehow, think of the magnificent opportunity that would present all over the world. Because as Governor Hoeven said, we figured out

what to do with sulfur, nitrogen and mercury. We can get rid of that.

If we can recycle carbon we can use coal everywhere and that would seem to me to be ripe for ARPA–E. There was one project at ARPA–E which sought to use electricity in a way that reused carbon and I don't think it in the end succeeded.

And there have been other projects that have recycled carbon. But they produced so much stuff. For example, it turned into limestone. Nobody knew what to do with all that limestone.

So it's—and there are a lot of smart people out there. You would think they would have solved it by now. But it seems to me that some biologist or some physicist will find a way to essentially recycle carbon in a commercially viable way so that we can use coal.

And I wonder if there were any comments that you had to make about that or if there were a way that you could put a priority on that. You have got the authority to do it, at least through ARPA–E and through a small amount of money that we appropriate to carbon reuse.

What are your thoughts?

Secretary PERRY. Senator, one of the things that we've done on the carbon capture utilization sequestration issue is to take it to a more global audience. Last year at the Clean Energy Ministerial in China, we were able to get that issue onto the list of areas that they were going to support, to study, to promote and in that Clean Energy Ministerial.

So we were able to move it into a, into a position of getting substantially more observation, if you will, more support, in the global community. The United States is going to be one of the leaders on that. Our national labs, some of the work that they are going to be doing.

I don't disagree with you. You and I have had this conversation before and in front of this committee a year ago. You know, there are certain parts of the budget that I have substantially more support for than others and if this committee, as they have done in the 2018 budget decide to fund ARPA–E, I'm going to with great energy work with you to find the places that we can have the biggest impact on this.

Senator ALEXANDER. Well, I appreciate that. But I was hoping it might—that with your interest in fossil fuels as well as your acknowledged interest in renewable energy as well that you might encourage ARPA–E in other parts of the Department to see if some scientist or some biologist could come up with this holy grail of the commercially viable carbon recapture. Because I'm not confident the sequestration is—I know it is not there and I don't know if it will ever get there. I keep thinking there's some bug or something in biology or something in physics that will make this possible, but I don't know how to do it.

Secretary PERRY. Yes, sir.

Senator ALEXANDER. I want to thank all of you for coming, Mr. Secretary, Ms. Gordon-Hagerty, thank you for coming. Mr. Dabbar, Mr. Vonglis, thank you for being a part of the Government and giving your time and energy to that. It's very important. You have an enormously important Department.

Senator Feinstein and I, all of us appreciate the responsiveness of the Department. The more you work with us and our staffs the easier it is for us to create an environment in which you can succeed. And if you can succeed, our country can succeed.

The hearing record will remain open for 10 days. Senators 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 be provided within 30 days of receipt.

SUBCOMMITTEE RECESS

Senator ALEXANDER. Thank you for being here. The committee will stand adjourned.

[Whereupon, at 4:11 p.m., Wednesday, April 11, the subcommittee was recessed, to reconvene subject to the call of the Chair.]