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DOE MODERNIZATION: ADVANCING THE ECONOMIC AND NATIONAL SECURITY BENEFITS OF AMERICA'S NUCLEAR INFRASTRUCTURE

TUESDAY, FEBRUARY 6, 2018

House of Representatives

Subcommittee on Energy

Committee on Energy and Commerce

Washington, D.C.

The subcommittee met, pursuant to call, at 10:00 a.m., in Room 2123 Rayburn House Office Building, Hon. Fred Upton [chairman of the subcommittee] presiding.

Members present: Representatives Upton, Olson, Barton, Shimkus, Latta, Harper, Kinzinger, Griffith, Johnson, Long, Bucshon, Flores, Mullin, Hudson, Cramer, Walberg, Duncan, Walden (ex officio), Rush, McNerney, Peters, Green, Doyle, Castor, Sarbanes, Welch, Tonko, Loebsack, Schrader, Kennedy, Butterfield, and Pallone (ex officio).

Staff present: Allie Bury, Legislative Clerk, Energy/Environment; Kelly Collins, Staff Assistant; Jordan Davis, Director of Policy and External Affairs; Wyatt Ellertson, Research Associate, Energy/Environment; Melissa Froelich, Chief Counsel, Digital Commerce and Consumer Protection; Adam Fromm, Director of Outreach and Coalitions; Jordan Haverly, Policy Coordinator, Environment; Zach Hunter, Director of Communications; A.T. Johnston, Senior Policy Advisor, Energy; Ben Lieberman, Senior Counsel, Energy; Mary Martin, Deputy Chief Counsel, Energy & Environment; Brandon Mooney, Deputy Chief Energy Advisor; Mark Ratner, Policy Coordinator; Tina Richards, Counsel, Environment; Annelise Rickert, Counsel, Energy; Dan Schneider, Press Secretary; Peter Spencer, Professional Staff Member, Energy; Jason Stanek, Senior Counsel, Energy; Madeline Vey, Policy Coordinator, Digital Commerce and Consumer Protection; Hamlin Wade, Special Advisor, External Affairs; Andy Zach, Senior Professional Staff Member, Environment; Priscilla Barbour, Minority Energy Fellow; Jeff Carroll, Minority Staff Director; Rick Kessler, Minority Senior Advisor and Staff Director, Energy and Environment; John Marshall, Minority Policy Coordinator; Alexander Ratner, Minority Policy Analyst; Andrew Souvall, Minority Director of Communications, Outreach and Member Services; Tuley Wright, Minority Energy and Environment Policy Advisor; and C.J. Young, Minority Press Secretary.

Mr. Upton. Good morning. Welcome to our second DOE modernization hearing, which will consider various issues that affect the economic and national security benefits associated with maintaining and advancing our nation=s nuclear infrastructure.

In 1954, Congress amended the Atomic Energy Act to provide for the peaceful, civilian use of nuclear energy, both domestic and abroad. Congress gave the Atomic Energy Commission -- the predecessor agency of DOE and the NRC -- the responsibility to oversee this nascent nuclear industry. And the nuclear industry in time achieved great success for the U.S., and contributed to global safety and security.

Today, more than 60 years later, many Atomic Energy Act provisions remain unchanged. Yet the world nuclear outlook has changed dramatically, and certain policies governing domestic involvement and participation in global markets really no longer reflects reality.

The U.S. is no longer the undisputed leader in civilian nuclear technology. Four hundred and forty commercial nuclear power reactors operate in 31 countries, with additional countries pursuing peaceful nuclear power programs. And for many years, subsidized state-owned nuclear companies have been successfully companies for commercial opportunities.

Throughout this Congress, we have examined two key challenges confronting the nuclear industry: how electricity

markets function, as part of our APowering America" series, and how to get our nation=s nuclear waste management back on track.

Today=s hearing is going to look at a wide array of other challenges facing the U.S. nuclear industry, and what is needed at DOE and NRC to maintain U.S. nuclear capabilities and leadership, and the security benefits that flow from that.

Some of the examples:

For instance, the U.S. lacks a vibrant domestic fuel cycle. Domestic uranium production has dropped to levels not seen since before nuclear reactors were commercialized. The sole domestic uranium conversion plant is on standby, and there is no U.S.-owned enrichment capacity.

Last year brought news of Westinghouse, an historic leader certainly in the nuclear fuel cycle, filing for bankruptcy protection; the abandonment in South Carolina of one of just two nuclear power plants under construction; and more operating nuclear power plants announcing premature shutdowns.

In my home district in Michigan, two nuclear sites provide hundreds of well-paying jobs, support local communities through tax revenue, and partner with charities throughout Southwest Michigan.

And as we examine these issues, we should remember that nuclear technology is not just about generating electricity. It serves critical economic and national security functions, such as powering our space exploration missions, developing lifesaving

medical treatments, protecting our nation=s borders, maintaining international nuclear safety and security leadership. These activities depend on the intellectual and technical capabilities provided by a robust nuclear infrastructure.

So, this morning we are going to hear from two panels of witnesses, including three key DOE officials who lead nuclear offices, as well as the NRC=s Executive Director of Operations. These witnesses will discuss the role of nuclear leadership.

Our distinguished second panel will provide additional perspective. I would like to welcome back Bill Ostendorff to the committee. You will remember that Mr. Ostendorff testified before our panel on many occasions during his tenure as an NRC Commissioner. Now, he is a Distinguished Visiting Professor at the U.S. Naval Academy, teaching a class about Congress -- maybe we need some lessons here on national security -- to future naval officers.

We are also going to hear from two national thought leaders on future nuclear technology development, including Dr. Mark Peters, the Director of the Idaho National Lab; and Dr. Ashley Finan, Nuclear Innovation Alliance=s Policy Director. Drs. Peters and Finan will provide their perspective on existing innovative nuclear opportunities and the Federal Government=s role in providing the necessary framework.

I also welcome Maria Korsnick, the President and CEO of the Nuclear Energy Institute, NEI. This is her second appearance

before the committee. And I appreciate her leadership during an uncertain time in the nuclear industry.

So, thank you all for being here. With that, I yield to the ranking member of the subcommittee, my friend Mr. Rush for an opening statement.

[The statement of Mr. Upton follows:]

**********INSERT 1**********

Mr. Rush. I want to thank you, Mr. Chairman, for holding this important hearing today on advancing the economic and national security benefits of our nation=s nuclear infrastructure. Mr. Chairman, as I understand, there are several views regarding nuclear policy that the majority has noted in its memo. I look forward to working with the majority side as we proceed through regular order and bring these bills up in a legislative hearing in order to hear from expert witnesses on the constant questions and impacts of these bills.

Mr. Chairman, I believe we may be able to come to a bipartisan agreement on most, if not all, of these bills in order to increase their chances of actually becoming law.

Mr. Chairman, as I have stated many times, I principally subscribe to an all-of-the-above in the portfolio as we move towards a low-carbon energy economy. I have also stated on many occasions, Mr. Chairman, that I believe nuclear policy must play a vital role as a source of safe, reliable, low-carbon power, and help us meet both the energy and environmental needs of the 21st Century.

While I did not agree with the recent Department of Energy notice of proposed rulemaking issued last year, that was recently removed, revoked by FERC, I continue to maintain that we must find a way to appropriately appraise nuclear energy nationally. Mr. Chairman, I believe this must be done in a fair, methodical, and transparent matter by the elected policy holders rather than

those that are done hastily and in secret by unelected agency officials.

Therefore, it is my hope that in addition to today=s hearing, we will have other opportunities to hear from stakeholders on the benefits, on the impact of more traditional nuclear facilities and more advanced nuclear technology, including non-light water reactors and light water small modular reactor design.

Mr. Chairman, this new and emerging technology will allow for the production of nuclear power more efficiently and with less waste than in current technology. Mr. Chairman, I can imagine a scenario where these small, less costly reactors can be utilized to power hard-to-reach, remote populations, whether they be in small rural communities in the Midwest, or maybe internationally, or even to help the thousands of Americans still living without power in Puerto Rico or the U.S. Virgin Islands.

To be sure, Mr. Chairman, there remains significant issues that must be addressed, including issues of safety, licensing, and commercialization of these advanced technologies. It is my intention, Mr. Chairman, that members of this subcommittee can indeed address many of these issues with bipartisan solutions that will benefit the nation as a whole.

So, Mr. Chairman, I look forward to engaging today=s distinguished panelists on both challenges and as well as the opportunities that lie ahead in this very important nuclear century.

Mr. Chairman, with that I yield back the balance of my time.

Mr. Upton. The gentleman yields back. The Chair would recognize the chairman of the full committee, the gentleman from the good state of Oregon for an opening statement.

Mr. Walden. I thank the chairman. And I thank our panelists and all the witnesses for your testimony today and for helping us with these very, very important issues.

This morning, as you know, we will examine several issues associated with the future of the nation=s nuclear power industry: the current domestic nuclear supply chain, international market opportunities, regulatory and policy matters, and what is necessary for developing and deploying future nuclear technologies.

Now, the testimony and our discussion represent another step in our efforts to more appropriately align the Department of Energy=s missions, management, and priorities with the challenges that face our nation today.

At root today, is a question of our nation=s capabilities, not only to propel nuclear innovation generally, but also to ensure an infrastructure that is critical to our economic and to our national security

Today=s civilian nuclear industry was born out of American=s national security needs and imperatives from 70 years ago. The first controlled nuclear reactions led to the Manhattan Project. That helped win World War II. The 1958 launch of the world=s

first nuclear-powered submarine, the U.S.S. Nautilus, marked the birth of our nuclear navy and resulted in our subsequent naval dominance.

President Eisenhower=s Atoms for Peace provided for peaceful, civilian use of nuclear technology, and that remains the foundation of the nuclear industry that is in place today.

Since that time, the civilian nuclear industry and its related infrastructure have been intertwined with our national security needs: projecting U.S. safety and security practices the world over, ensuring engineering and scientific understanding to safeguard nuclear materials, and developing the economic and commercial relationships that ensure a more secure world.

To continue to harvest the economic and national security benefits associated with our domestic nuclear energy infrastructure, however, we must recognize the world looks different than it did at the birth of the nuclear age. Consequently, we must take steps to update the relevant policies. These policies must be forward looking to enable innovation and the deployment of new advanced nuclear technologies.

Oregon-based NuScale is an example of one of those innovative nuclear companies. NuScale=s small modular reactor proposed design recently received approval for a significant milestone when the Nuclear Regulatory Commission signed off on the design=s passive cooling system. This decision is a game changer for the regulatory framework. And I applaud both NRC and NuScale on their

breakthrough.

The Department of Energy=s recent public-private partnership with NuScale helped enable these near-term successes. So, to unleash long-term innovation, DOE must capitalize and nurture its nuclear infrastructure, including research and test facilities, intellectual expertise, and institutional leadership. This foundation is critical to both economic and national security imperatives, but requires long-term program stewardship, in addition to the underlying statutory authority and direction.

Today=s hearing continues the committee=s ongoing review of the Department of Energy. But I should also note that it has been more than 30 years since the Nuclear Regulatory Commission was last reauthorized. Congressmen Kinzinger and Doyle=s legislation to improve NRCC=s efficiency -- excuse me, NRC=s efficiency -- old habits die hard -- and budget process is a good start. And I appreciate their interest and their leadership on this issue.

This morning=s diverse witness panels will help inform our efforts to reinvigorate our nation=s critical nuclear infrastructure. And I look forward to your testimony.

With that, Mr. Chairman, I yield back the balance of my time.

[The statement of Mr. Walden follows:]

**********INSERT 2**********

Mr. Upton. Time is yielded back.

The chair would recognize the ranking member of the full committee, the gentleman from New Jersey Mr. Pallone, for an opening statement.

Mr. Pallone. Thank you, Mr. Chairman. Today=s hearing is the second in the subcommittee=s Department of Energy modernization series. It is an important step in our bipartisan efforts to advance the economic and national security benefits of America=s nuclear infrastructure.

First, I must mention that while the majority=s memo lists three bills for consideration today, we have been assured by the majority that this is not a legislative hearing on these bills. Without commenting on the merits of the legislation, I want to make clear that it=s essential for this subcommittee to hold a legislative hearing prior to moving these bills. It=s critical that members have the opportunity to engage with appropriate witnesses who can properly analyze the impact of the proposals.

At the subcommittee=s first DOE modernization hearing I noted the department can improve and more successfully fulfill its mission. Today=s hearing is the logical next step, because I believe that DOE=s Office of Environmental Management and the National Nuclear Security Administration are two of the key entities within DOE that are in greater need of oversight.

For example, the environmental management program in recent years has been plagued by high-profile leaks of radioactive waste,

contractor problems, missed deadlines, and escalating cleanup costs. In 2014, an Augustine-Mies Panel report concluded that NNSA lacks a stable, executable plan for modernization. The report also found that NNSA faces challenges in its governance of the nuclear security enterprise. And I believe this is an area where we can work in a bipartisan fashion to address these issues.

We must also ensure that taxpayer dollars are being managed in a fiscally responsible manner. For example, according to the GAO 2017 high risk designation, DOE=s Office of Environmental Management has spent $35 billion in the last six years alone, primarily on treating and disposing of nuclear and hazardous waste. Yet, environmental liability grew over the same period by over $90 billion. So it is particularly important that DOE address environmental liabilities in a cost effective way, while also ensuring public health and safety.

These concerns lead me to question whether DOE=s nuclear activities need some sort of formal external regulation and independent oversight, whether by the Nuclear Regulatory Commission or another entity. DOE=s track record for regulating itself over the past 40 years is mixed at best. External regulation may be a way to improve that record. And this is an idea that the Subcommittee on Energy had explored on a bipartisan basis in the past. It may be time to do so again.

Today=s hearing also affords us the opportunity to

contemplate what American nuclear infrastructure might look like in the coming decades. It is no secret that building new nuclear power plants has been a challenge. The Vogtle Project in Georgia has experienced skyrocketing costs and prolonged construction delays, while the V.C. Summer Nuclear Power Plant in South Carolina has been abandoned entirely, all the while more and more existing plants are announcing plans to permanently shut down. These include in New Jersey the Oyster Creek Nuclear Generating Station just south of my congressional district, which last week announced it will close in October of this year, one year earlier than planned.

If our country is going to meet its carbon reduction goals, then nuclear energy may still be needed as a part of the solution for awhile. And after all, despite the President=s efforts, we are fortunately still a party to the Paris Climate Accord. So, while I do not think the Federal Government should be subsidizing nuclear plants in the competitive markets, it is important that we invest in research into advanced nuclear reactors that can potentially generate power more efficiently, with less waste than our current reactor fleet.

So I look forward to hearing from our two knowledgeable panels about DOE=s nuclear mission and where we should focus efforts to improve these programs.

Thank you, Mr. Chairman. I yield back.

Mr. Upton. The gentleman=s time has expired and he yields

back. So, at this point we will listen to our testimony by our four distinguished witnesses.

I would note that your testimony in full is made a part of the record, so we would like to limit your remarks in summary to no more than five minutes.

Mr. McGinnis, Principal Deputy Assistant Secretary for the Office of Nuclear Energy, we will start with you. Welcome. Thank you.

STATEMENTS OF ED MCGINNIS, PRINCIPAL DEPUTY ASSISTANT SECRETARY, U.S. DEPARTMENT OF ENERGY, OFFICE OF NUCLEAR ENERGY; ART ATKINS, ASSOCIATE DEPUTY ADMINISTRATOR FOR GLOBAL MATERIAL SECURITY, U.S. DEPARTMENT OF ENERGY, NATIONAL NUCLEAR SECURITY ADMINISTRATION; JAMES OWENDOFF, PRINCIPAL DEPUTY ASSISTANT SECRETARY, U.S. DEPARTMENT OF ENERGY, OFFICE OF ENVIRONMENTAL MANAGEMENT; AND VICTOR MCCREE, EXECUTIVE DIRECTOR OF OPERATIONS, U.S. NUCLEAR REGULATORY COMMISSION

STATEMENT OF ED MCGINNIS

Mr. McGinnis. Thank you very much, Chairman Upton. I would also like to thank Ranking Minority Member Rush, and also the other members of this subcommittee. It is a great privilege to be here today.

Let me just start out by saying the United States pioneered the development and peaceful use of nuclear power to produce around-the-clock, emissions-free electricity. As a result of U.S. leadership in nuclear energy, American citizens have benefitted from the truly unique source of electricity for the last seven decades. Nuclear power plants have served as bedrocks to communities across the country to thousands, providing high-paying, skilled jobs to hundreds of thousands of Americans. And our nuclear energy capabilities have supported our nation=s energy security, grid reliability, and national security.

However, the U.S. nuclear energy sector is now under historic

downward pressure, has lost a tremendous amount of its once dominant global market share, and has seen a significant degradation in our manufacturing base. In response, the President, on June 29th of last year, announced that we would conduct a complete review of the U.S. nuclear energy policy to help find new ways to revive and expand this crucial energy resource.

The Department of Energy is now working to implement the President=s direction, vigorously I might add. Within the department=s office of Nuclear Energy, we focus our work in three mission areas: the nation=s existing fleet, the development of advanced nuclear reactor concepts, and also fuel cycle technologies.

The department is partnering with industry to develop the technical basis for the continued safe and economic operation of the current fleet of nuclear power plants, as well as developing technical solutions to enhance the economics, performance, and safety of nuclear power plants. This includes supporting the development of technologies such as accident tolerant fuels, which have the potential to significantly increase the performance of our nation=s current fleet of reactors, while also reducing costs.

By continuing to support improvements to the efficiency, productivity, and operating lifetimes of our nation=s nuclear fleet through technology R&D, the department is helping industry

realize its full potential in contributing to our nation=s emissions-free, reliable electricity supply.

The department is also working to advance our nation=s next generation of advanced reactors, including potentially game-changing advanced Small Modular Reactors. Advanced reactor concepts have the potential to deliver improved performance and efficiency, reduced costs, enhanced resource utilization and waste minimization, as well as enhanced flexibility to include non-electric applications, and even load following.

The department recently announced a $30 million funding opportunity in fiscal year 2018 to support early stage research and development of advanced nuclear energy technology. By focusing on the development of innovative advanced reactors, and leveraging private-public partnerships in a world class national laboratory system, we can support strong domestic industry now and into the future.

The department is also working to support the civilian nuclear fuel cycle. We recently took an important step toward revitalizing our fuel cycle R&D capabilities when Idaho National Laboratory resumed operations at the Transient Reactor Test Facility, otherwise known as TREAT, which had been shut down since 1994. This capability is an important asset to nuclear scientists and engineers as they work to increase the safe and performance -- safety and performance of current and future nuclear reactors.

The department is also conducting research and development activities that would be necessary for the development of a versatile, fast test reactor. Development of that would be very important potentially. While a decision whether or not to deploy an advanced fast spectrum test reactor has not been made, such a reactor would accelerate innovation in advanced fuels and materials for U.S. vendors, and pave the path to U.S. global leadership in advanced nuclear R&D by reestablishing this capability.

Finally, in conclusion, the Administration is fully committed to nuclear energy as a vital component of our nation=s energy system. By leveraging private-public partnerships and our national laboratory system, we can support the development of a new class of U.S. advanced reactors; an innovative, responsive nuclear energy supply chain; and advanced nuclear energy fuel cycle technologies, positioning the U.S. for dominance in the 21st Century.

Thank you very much.

[The statement of Mr. McGinnis follows:]

**********INSERT 3**********

Mr. Upton. Thank you.

Mr. Atkins is Associate Deputy Administrator for Global Material Security at the National Nuclear Security Administration. Welcome to you.

STATEMENT OF ART ATKINS

Mr. Atkins. Thank you. Chairman Upton, Chairman Walden, Ranking Member Rush, and members of the committee, thank you for the opportunity to represent the Department of Energy=s National Nuclear Security Administration and discuss its important role in national security. We truly appreciate your interest in NNSA=s critical missions and your continued support of its projects and its people.

NNSA is charged with three important and enduring national security missions:

First, maintaining the safety, security, reliability, and effectiveness of the nuclear weapons stockpile;

Second, preventing, countering, and responding to global nuclear threats, and;

Third, providing naval nuclear propulsion to the U.S. Navy=s fleet of aircraft carriers and submarines.

At the same time, NNSA recognizes the important role played by civil nuclear energy, both in the United States and abroad, and the connectivity that exists with our national security missions.

For instance, the science and engineering performed by our labs, plants, and sites underpins our critical defense in non-proliferation missions, and the advances in these interdisciplinary efforts yield concrete benefits to the civil

nuclear industry, and vice versa.

While the burgeoning international market provides a significant commercial opportunity for the U.S. nuclear industry, the export of U.S. nuclear technology still poses significant nuclear non-proliferation concerns. Therefore, it must be carefully managed.

NNSA is committed to striking the appropriate balance between facilitating legitimate commerce, while also controlling proliferation of weapons-usable material, equipment, technology, and expertise. In implementing NNSA=s mission, we ensure that not only is the United States abiding by the highest non-proliferation standards in nuclear exports, but that those standards are also matched by our global partners and global suppliers.

There are two primary mechanisms we implement to achieve these standards. The first, 123 Agreements. These establish the legal framework for U.S. companies to export nuclear reactors, nuclear fuel, and equipment to foreign companies and governments.

NNSA plays an important role in the conclusion of 123 Agreements. We provide, on behalf of DOE, technical assistance to the State Department, which leads negotiations on new 123 Agreements.

Additionally, the Secretary of Energy has the legal authority to authorize proposed exports of unclassified U.S. nuclear technology and assistance. This authority is

implemented under 10 C.F.R. Part 810 regulation, which NNSA is responsible for administering.

In response to feedback from U.S. industry and other stakeholders, we have taken a number of steps to simplify and update the Part 810 regulation, and have implemented significant improvements in the process for reviewing export applications. These efforts have already reduced average processing time from more than 18 months to approximately 12 months. And our goal is to reduce this review time even further.

However, some challenges remain outside of NNSA=s control. For instance, the lengthiest part of the Part 810 review process is the effort to obtain the required government-to -- government non-proliferation assurance. This is handled by the State Department. This process can take, can often take six -- pardon me. This process can also take, can often take six months or longer.

The U.S. Government works closely with partner countries to obtain these assurance, but industry also has a pivotal role to play. We encourage U.S. exporters to discuss the importance of these assurances with their customers who, in turn, can highlight the issue with their government counterparts.

Equally as important, NNSA also bears responsibility for managing our nation=s stockpile of uranium, most of which was produced during the Cold War. The department requires a reliable supply of enriched uranium to accomplish important defense and

non-defense needs. In order to meet the requirements for enriched uranium, the department currently relies on downwinding campaigns. The department downwinds excess highly enriched uranium, including material that is surplus for defense needs, to create low enriched uranium suitable for power reactors, research reactors, and medical isotope production.

Longer term, NNSA=s Defense Programs is working to reestablish a domestic uranium enrichment capability to ensure the supply of low enriched uranium fuel for tritium production, a need that cannot be met by commercial industry. We are exploring unified strategies in which a domestic uranium enrichment capability could also meet departmental and commercial needs for High-Assay LEU and HEU for naval propulsion.

To conclude, NNSA recognizes that the effective implementation of our mission is strengthened by strong partnerhips with industry. NNSA needs these strong industry partners to resolve the critical national security issues that we face.

Again I want to thank you for your support for our programs and your time. And I look forward to answering any questions that you may have.

[The statement of Mr. Atkins follows:]

**********INSERT 4**********

Mr. Upton. Thank you.

Next we have James Owendoff, Principal Deputy Assistant Secretary at the Office of Environmental Management, Department of Energy. Welcome again.

STATEMENT OF JAMES OWENDOFF

Mr. Owendoff. Chairman Upton, Chairman Walden, Ranking Member Rush, and distinguished members of this subcommittee, I appreciate the opportunity to appear before you today to discuss the Department of Energy=s Environmental Management Program.

The Federal Government=s nuclear weapons production programs have made significant contributions to our nation=s defense for decades, helping end World War II and the Cold War. In addition, government-sponsored nuclear energy research also made significant contributions to domestic energy growth and prosperity. The legacy of these programs is a massive amount of radioactive and chemical waste and contaminated facilities at sites across the country. It is the mission of DOE=s Office of Environmental Management to clean up or remediate legacy waste and facilities.

This legacy includes 90 million gallons of radioactive liquid waste stored in aging underground tanks.

This legacy also includes 5,000 contaminated facilities, 700,000 tons of depleted uranium, millions of cubic meters of contaminated soil, billions of gallons of contaminated water, spent nuclear fuel, and other nuclear materials.

EM must execute its mission as safely, efficiently, and cost-effectively as possible. This involves constructing new infrastructure, like waste storage facilities and waste treatment

plants. This mission also involves the management and retrieval of liquid waste, as well as the decommissioning and demolition of deteriorating facilities that ultimately reduce maintenance and monitoring costs.

EM=s first priority is worker safety, as well as protection of the public health and the environment. These are essential components of our cleanup objectives. EM will continue to discharge its responsibilities by conducting cleanup within a ASafe Performance of Work." This culture integrates protection of the environmental, safety, and protection of worker and public health into all work activities.

Taking many variables into account, such as risk reduction and compliance agreements, EM has the following priorities:

Radioactive tank waste stabilization, treatment and disposal;

Spent nuclear fuel receipt, storage, and disposition;

Special nuclear material consolidation, stabilization, and disposition;

Transuranic and mixed/low-level waste treatment and disposal;

Soil and groundwater remediation, and;

Excess facilities deactivation and decommissioning.

Across these programmatic areas it is important to note that approximately half goes to maintaining our facilities across the complex in a safe, operational-ready stance. This includes

activities such as facility infrastructure maintenance and complex-wide safeguards and security, and cybersecurity activities. The scope of these activities covers security of special nuclear materials and safety of high-level radioactive waste and spent fuel, along with the maintenance of thousands of square feet of deteriorating nuclear processing facilities awaiting eventual future demolition.

The nature and length of the EM mission, coupled with the sheer technological complexity of cleanup means that we always face challenges -- some anticipated, others unexpected. These obstacles certainly warrant our careful attention, but EM also has proven its ability to meet tangible results.

When we began the program in 1989, EM was responsible for a total of 107 sites, covering 3,100 square miles, that area, larger than Rhode Island and Delaware combined. During early years we focused on characterizing waste. Since then, EM has accomplished cleanup and closure of major sites in Colorado, Ohio, Missouri, and Florida; decommissioning of a gaseous diffusion plant in Tennessee; vitrification of more than 4,000 canisters of high-level waste in South Carolina; and removal of all the plutonium metal and oxides from Washington State.

That is, ensuring there is an essential safe work environment at all of our sites is our highest priority. As we work to best position EM for success now and into the future, we also continue to pursue robust technology development, and infrastructure

investments that ensure safe and uninterrupted operations.

EM=s progress means safe, cleaner sites in the communities that hosted defense nuclear activities for decades. This kind of progress is not possible without our workforce, members of Congress, regulators, community leaders, and other partners.

Mr. Chairman, I welcome the input of the committee as EM continues work on aggressive, achievable cleanup plans that recognize these difficult technical challenges, while making substantial progress on the many goals we share with you and your constituents.

Thank you for this opportunity.

[The statement of Mr. Owendoff follows:]

**********INSERT 5**********

Mr. Upton. Thank you.

Last on this panel we are joined by Mr. McCree, Executive Director of Operations from the NRC. Welcome to you, sir.

STATEMENT OF VICTOR MCCREE

Mr. McCree. Thank you. Good morning, Chairman Upton, Ranking Member Rush, and distinguished members of the subcommittee. I appear before you today representing the staff of the Nuclear Regulatory Commission. I am pleased to have this opportunity to meet with you to discuss the steps that we have taken to ensure the NRC=s readiness to fulfill our mission in light of advancements in nuclear technologies being contemplated by the nuclear industry. The NRC is actively working with stakeholders, including the Department of Energy, to establish shared expectations and develop strategies to prepare for future reviews.

We are also enhancing our processes to execute our safety and security mission in a manner that reflects our Principles of Good Regulation. Today I will briefly highlight several of our efforts.

Regarding new reactors, in March of last year the NRC docketed the first application for a small modular reactor design certification submitted by NuScale Power. And the overall regulatory review of the design is progressing on the established schedule.

In May of 2016, the NRC received an application from the Tennessee Valley Authority, or TVA, for an early site permit at the Clinch River Nuclear Site in Tennessee to evaluate the

suitability for a potential new small modular reactor. This review is also, this review is also progressing on schedule.

With respect to future advanced reactor designs, the NRC staff has developed a multi-part strategy to prepare for the review of non-light water reactor technologies. This strategy has three objectives: enhancing technical readiness; optimizing regulatory readiness; and enhancing communication. We have made significant progress in fulfilling these objectives.

Five developers of non-light water reactor designs have expressed their intent to begin regulatory interactions with the NRC. And we have already begun formal pre-application interactions with Oklo, Incorporated, on its compact fast reactor design. We anticipate starting additional pre-application reviews this year and next fiscal year, in 2019, and beginning one or more advanced reactor application reviews in the next two to four years.

Regarding our effectiveness and efficiency initiatives, in June 2014, the NRC began an initiative, referred to as Project Aim, to enhance the agency=s ability to plan and executive its mission in a more effective and efficient manner. Although we have achieved a significant milestone last year by completing the major deliverables for each of the 19 discrete tasks, and realizing approximately $48 million in reductions, we are committed to continuing actions to improve our effectiveness, efficiency, and agility.

In fact, this month the NRC staff started an initiative to further transform our regulatory approach to better handle potential new and novel technology, such as accident tolerant fuel and advanced non-light water reactors.

In the area of human resources, the NRC developed a Strategic Workforce Plan that is focused on having the right people with the right skills and competencies at the right time and place to achieve the agency=s safety and security mission. We are continuing to refine this plan to ensure the NRC=s workforce planning efforts are timely and responsive to changes in workload, while the agency retains and develops the skills needed to support our mission.

As for fees, the NRC understands the importance of a predictable, transparent, clear, and understandable fee structure. To this end, the NRC is overhauling its fee billing process to offer greater transparency, using several methods, including testing the use of flat fees; revising how billable work is tracked and reported; and starting next month, identifying each unique activity charge and the name of the person who performed the work on the invoices.

With respect to other domestic and international activities, in cooperation with DOE, the nuclear industry is researching advanced fuel designs that are expected to exhibit improved safety margins under both normal and postulated accident conditions, when compared to fuel types that are used today. Several vendors

are exploring candidate designs, which are collectively referred to as accident tolerant fuel, or ATF as you heard earlier.

In response, the NRC will soon finalize a comprehensive plan to ensure that we are prepared to effectively and efficiently review ATF designs. Our regulatory interaction with the DOE in preparing our project plan has allowed us to explore opportunities to leverage experimental and computational work already conducted by the department.

As for our international activities, the NRC serves as the licensing authority for proposed exports and imports of pf commercial nuclear equipment and materials, and is committed to maintaining robust partnerships with our regulatory counterparts worldwide. These interactions allow the NRC to share best practices, shape the content and scope of technical publications, participate in peer reviews, and access research facilities not available in the U.S.

In closing, the NRC continues to focus on fulfilling our safety and security mission in a more transparent, effective, and efficient manner. Chairman Upton, Ranking Member Rush, and distinguished members of the subcommittee, I thank you for the opportunity to appear before you today, and would be happy to respond to your questions. Thank you.

[The statement of Mr. McCree follows:]

**********INSERT 6**********

Mr. Upton. Thank you all for your testimony. And I know you made a very strong case for maintaining the U.S. leadership position, not only here obviously in the United States, but also worldwide in so many different ways.

I have to say that many of us, just about all of us here support an all-of-the-above energy strategy, and that includes safe nuclear power, something that we indeed care about. And for a host of reasons we have seen a number of major nuclear gener -- electric generators frozen or beginning now to decline as that number is reduced, as a number of different facilities have announced that they are going to be shutting down.

But you also make the point, as the second panel, that our leadership is needed, particularly on defense. I was, I was fortunate to be at the dedication, the christening of the U.S.S. Ford, the new class of aircraft carriers this last year, a nuclear-powered aircraft carrier. Know lots of folks who serve on our nuclear-powered submarines with the obvious reasons why they are efficient. So the need for trained personnel in the nuclear engineering field is enormous here in the U.S., but worldwide.

And as the number of major facilities, electric generating facilities are frozen or beginning to decline, I think many of us are looking at the prospects of smaller generators, smaller units to be approved. This has been in the mix for some time, a number of years. And I would guess that probably, Mr. McGinnis

and Mr. McCree, you are probably the -- where exactly are we in terms of seeing some of those promising designs be approved. And what is your guess as to the timeline, if it is approved, that we would actually begin to see these smaller generating units actually be brought into the commercial sector to serve the nation? Mr. McGinnis?

Mr. McGinnis. Thank you for the question, Mr. Chairman. And I certainly defer to my colleague Mr. McCree to add.

But right now I agree, we are in an extremely challenging moment in time. Many in the industry and in my office=s view actually see our nation at an inflection point with regards to the, to the future of our nuclear fleet. In fact, I would say we are at a tipping point.

Our ability to bring in new reactors in the pipeline is key. We have an historic number of premature shutdowns of plants that many would not have ever predicted four or five years ago, fully amortized assets, multibillion dollar low operating and management costs, yet we are seeing that today in some of the districts of members here today.

So it is a great challenge. We have a pipeline that once had about 27 units back in 2007-2008, working its way through the NRC. We have a grand total of one construction and operation license going through with Florida Power and Light. And we have one advanced SMR design. That advanced SMR design, as we mentioned, is NuScale. I think it is potentially significantly

game changing. There are a number of other U.S. small modular and other advanced designs.

Frankly, I would say the United States is still unequivocally the leader in the design development of advanced reactors, bar none. We are challenged in the deployment, that is for sure. But with regards to the advanced reactors, we are leading. And it is an exciting time to figure it out.

The NuScale design reflecting the strong support and investment, frankly, from Congress. Almost $200 million we have invested in technically partnering with NuScale. It has the promise of being the first advanced SMR reactor entering the fleet in our country. 2026 is the timeline for Idaho National Lab. And UAMPS is the municipal utility looking at it.

And great compliments to the NRC, they are in fact, as the chairman mentioned, really conducting an historic review of our nation=s first advanced reactor.

A couple of things that this NuScale reactor brings in my view is game changing: one is financeability. As opposed to an $8 billion unit for a gigawatt larger before financing, you are looking at a unit that may cost only about a billion to a billion-and-a-half to put that base plant, with 350 to 450 million per unit adding to it, allowing the utility to take bites at a time.

Mr. Upton. I know my time has expired. But, Mr. McCree, do you just want to comment, do you verify what Mr. McGinnis has

said in terms of the timeline that we may be on?

Mr. McCree. Yes, Chairman. Thank you for the question.

With regard to the timeline, as I alluded to in my testimony, we docketed the NuScale application in March of last year and informed them of a 42-month review schedule, which if continued to move at the pace that they are moving, would support a final safety evaluation for design certification in September of 2020.

The review is proceeding on schedule. We are 70 percent through the Phase 1 of a 6-phase review. And we are working very closely with the applicant NuScale to address the issues that have been revealed thus far.

Mr. Upton. Thank you.

Mr. Rush.

Mr. Rush. I certainly want to thank you, Mr. Chairman.

Mr. Atkins, in the April 2017 report from the GOA -- GAO rather, the GAO concluded that the estimates provided by the NNSA of the funding necessary to carry out the NRC=s modernization agenda sometime, sometime exceeded the President=s budget proposal by millions of dollars. GAO also found that the cost of some major modernization programs, including nuclear weapon refurbishment, could also be severely underestimated.

One recommendation that the GAO made was for the NNSA to include a cost-benefit analysis of its modernization program in future versions of its annual plan on stockpile stewardship.

What position does the NNSA take on both the problems

identified by GAO and the recommended solutions? Are you confident that the agency can respectfully perform its duties with its current level of funding?

Mr. Atkins. Thank you for your question, sir.

The department and the NNSA recognizes that it is of vital importance to recapitalize and modernize our aging infrastructure. This is something that NNSA is very committed to. And it is true, over time the resources have not kept pace with the need for modernization that we have seen to ensure the facilities that are necessary to maintain, a safe, reliable, and effective stockpile are maintained.

We have increased our budget request since 2015 to work on the backlog of deferred maintenance. And in 2016 and 2017 we were able to actually stop the increase in deferred maintenance. So it is something that we continue to work on and we will continue to endeavor to improve.

As far as the GAO=s recommendation, we take all of the recommendations that the GAO has provided very seriously. And there is a commitment to incorporate a cost-benefit into that, into that, sir.

Mr. Rush. Mr. Owendoff, they say the 2017 GAO study also found that DOE has charges in addressing its environmental oversight and the amount of funding needed to invest all of its cleanup responsibility. Specifically GAO noted that the cost estimate for DOE=s proposal for separate defense and commercial

nuclear waste repositories excluded the cost and timeframe for site selection and site characterization. This omission occurred because the agency named more than the DOE reported environmental liabilities.

Has DOE implemented any of the 28 recommendations that GAO proposed in order to reduce the long-term costs, as well as the environmental risks more quickly?

Secondly, what is the timeline for enacting all of these recommendations so that the taxpayers= dollars are being utilized more efficiently?

Mr. Owendoff. Thank you for the question, Mr. Rush. Certainly, as I mentioned, over half of our budget goes towards maintaining a safe condition with the radioactive material, special nuclear materials at our facilities. So with the balance of the funds we utilize those in the highest risk areas. As I mentioned, that principally is radioactive liquid waste and spent fuel, to put in place facilities that can, in the case of tank waste, bring that into glass, vitrified in glass. We think we have been very successful in that program.

Certainly there are going to be first of a kind, one of a kind challenges that we have that are not faced, certainly, in the commercial industry or that we have to build. One of those is a waste treatment plant at Hanford. That has been a challenge for us. But I think on the flip side, if you look at our closure and cleanup of Rocky Flats, we did that within the money that

we estimated. You can go to Rocky Flats now and it=s preserved that you can walk across.

This is a challenging business, sir. And we take it seriously. And we are working each and every day at how we can be more cost effective.

Mr. Rush. I yield back, Mr. Chairman.

Mr. Upton. The gentleman=s time has expired. The Chair recognizes the chairman of the full committee Mr. Walden.

Mr. Walden. I thank the gentleman. And, again, thank you all for your assistance in our efforts on these issues.

Mr. McCree, as I mentioned in my opening statement, and as we have discussed a bit before the committee, the NRC=s recently determining that NuScale=s design for a small modular reactor would not need what is known as a Class 1E power requirements for offsite electricity. This class of power is a regulatory standard set for design of safety-related nuclear power plant electricity systems.

What=s the impact of this determination with respect to potential changes for regulatory and licensing requirements?

Mr. McCree. Thank you, Congressman, for the question.

What this reflects is our focus on design functionality, the functionality of the design that will be later demonstrated and validated by the applicant and/or the COL, as opposed to greater design detail. It=s a philosophical but substantive change that I believe will contribute to more efficient but just

as effective reviews in this important area.

Mr. Walden. So if this goes all the way through the process and is approved, what will this actually mean for the power sector?

Mr. McCree. Well, I would defer to my colleague from the DOE. Our focus, of course, as the independent safety regulators --

Mr. Walden. Right.

Mr. McCree. -- is to assure that this application is, is safe and that it can be certified and later built if there was a utility that wants to do that. But, again, I would defer to my colleague from the DOE.

Mr. Walden. Would you like to respond to that?

Mr. McGinnis. Thank you very much. Yes, I would.

It would mean a tremendous amount. We don=t use the word Agame changer" lightly. The wall that has faced utilities in the form of financing, up front capital, cannot be overstated. Notwithstanding the other game changing aspects of small modular reactors such as NuScale, we are talking about highly flexible, 12 different 15 megawatt electric units, all of which is designed to be operated at different levels.

So you are offering great opportunity, flexibility for a utility to have it serve as load following, to have it serve, pair it up with other hybrid sources of generation. And also from a financing perspective, as I said, not having to put $8 billion up front and not have any generation from that for many,

many years, they are only putting down a small subset.

I think what the implication is is potentially dramatically opening up the market, a market that would never really be materialized with large reactors, as valuable as large reactors still are. We just simply have utilities that don=t have the financial wherewithal and also are very, I would say very excited about the design attributes.

Mr. Walden. And when you talk about this, can you give me a perspective that relates to integrating renewables onto the grid using this type of nuclear power? Does that give you more flexibility because of the modular nature?

Mr. McGinnis. Indeed. The flexibility is exactly why we are now looking and doing R&D on hybrid generation where we are looking at -- in fact you will hear from Dr. Peters I would think with regards to Idaho. That is where we are doing cutting edge work. We are literally looking at pairing an advanced small modular reactor with the wind turbine, with the solar plant. The benefits of both are, can be very significant.

Mr. Walden. And can they ramp up and ramp down --

Mr. McGinnis. Yes.

Mr. Upton. -- like, say, a gas turbine plant does?

Mr. McGinnis. Right.

Mr. Walden. You would be able to do that with nuclear?

Mr. McGinnis. Indeed. Not only do you have, one reason why is you have 12 different units. And the intent, the design

of course is going through the NRC now for validation --

Mr. Walden. Right.

Mr. McGinnis. -- from a safety perspective, but the intent is to offer the operator significant versatility in having different load following or power generation throughout the day. And so that can be -- that is a power combination with intermittence and bringing in the emissions-free baseload generation. It is quite exciting in my view.

Mr. Walden. Which is what this would be, emissions-free --

Mr. McGinnis. Yes.

Mr. Walden. -- nuclear?

Mr. McGinnis. Indeed. Absolutely.

Mr. Walden. I will restrain myself. But this committee has voted 49 to 4 to also resolve the long-term nuclear waste storage issue. And the extent to which those who seek to move forward with additional nuclear power can assist our committee in its efforts to get this to the President=s desk, we would be most appreciative.

With that, I would yield back, Mr. Chairman.

Mr. Upton. The gentleman yields back.

The Chair would note that votes on the House floor are taking place. The second bells have rung. We have got at least three votes here that are queued up. So, we are going to go vote. It probably will be at least a half hour, and we will resume with

questioning on the Democratic side.

With that, we stand in recess.

[Recess.]

Mr. Upton. We will resume. Sorry for the delay but we had a number of votes on the floor. And we will resume with Mr. McNerney from California for five minutes. The gentleman is recognized.

Mr. McNerney. I thank the Chair. I rushed over here with my friend Mr. Shimkus to make sure I didn=t hold up the hearing any today.

Mr. McGinnis, you had a lot of interesting topics that you kind of went over. One of them was accident resistant fuels. Can you kind of describe what that is?

Mr. McGinnis. Thank you for that question. Indeed, accident tolerant fuels is, really represents a class of advanced fuels that are being developed. There are three commercially led designs that are being where we are technically partnering with these three consortia. We selected them through a competitive process. And it includes one led by GE, one led by Westinghouse, and one led by what was known as AREVA.

These three designs are being developed to be able to go in the current fleet of reactors and brings increased safety and economic benefits. Potentially there is great promise. Utilities are very interested in it. In fact, we are going to see a major milestone this year. We are going to see the first

test pins, and also relatedly, test assemblies going into a U.S. operating reactor to begin testing this new fuel.

There are three different types, but essentially all three offer improved cladding that can have greater heat tolerance, and also improvement in economics.

So, those are moving forward. By end of 2019 we expect all three of these designs to have their initial test pins operating in reactors. We are looking at about 2025, hopefully even sooner, to have the first official fuel reloads going in if things get proven out to go into fleet. So these are, frankly, seen as game changers by many of the utility operators and owners of the, of the nuclear reactor fleet.

Mr. McNerney. Well, SMRs are -- to change the subject -- SMRs are a big talk and maybe game changers, as we have discussed. The load following characteristics sound pretty good. I have a hard time picturing how you are going to get nuclear reactors to follow fast loads, but I will wait to be shown that. I will remain skeptical.

And we talked about an SMR design being approved by the NRC. What about SMRs overseas, what are the -- what is happening overseas? Mr. Atkins, you are probably the right one to answer that question.

Mr. Atkins. Pardon me. Thank you for your question, but actually I believe this is probably --

Mr. McNerney. Okay.

Mr. Atkins. -- more of a question for Mr. McGinnis.

Mr. McGinnis. Thank you again. In the past, for the past 11 years, until recently being put in this position, I led the international nuclear work for the Department of Energy, which included advocacy for our U.S. nuclear exporters. And I can tell you firsthand, there are numerous countries, nuclear markets around the world that are watching very closely the progress of these U.S. SMR designs.

And they are highly interested in these SMR designs, in particular the U.S. SMR designs, as indicated. We really are the leaders, bar none, in the design development. So one thing that would happen is you would -- if we prove out the advanced SMRs in the U.S., this could open up an entire market globally for countries whose grids are just too small for a gigawatt or larger, but don=t have the capital to be able to finance.

Mr. McNerney. So would we be producing them and selling them, or would other countries take over our designs and produce them and sell them in our place?

Mr. McGinnis. Ultimately, if a company has non-government money in it, non-federal dollars, it is going to be their call. Obviously, with tech transfer and other non-proliferation and NRC oversight for any exports. But I can tell you that when it comes to, in the Department of Energy, Office of Nuclear Energy, dollars that are put towards technically partnering, developing, IP, joint development of an SMR, for example, we are definitely

going to have a say in our cooperative agreements. And we are going to, frankly, insist that we see these, these reactors serve as an export product, not just migrating overseas.

I can tell you that for NuScale, for example, it is intended to be factory produced. And the intent is absolutely to produce them in the United States. And they have already done a study that looked at the supply chain which essentially, in my view, validated the ability to be able to produce all the major components in the United States then export.

Mr. McNerney. I was going to ask Mr. Owendoff about nuclear waste. But I think I am going to have to let Mr. Shimkus take that one.

Thank you. I yield back.

Mr. Upton. It is teed up. Mr. Olson.

Mr. Olson. I thank the Chair.

And welcome to our four witnesses. I am sorry for the vote cycle between your first appearance and second one.

Nuclear power is very big back home in Texas 22. The South Texas Project Plant is about 100 miles south of my district, based in Texas. Opened in 1979. Been up and running now for almost close to 40 years.

Hurricane Harvey direct hit on that reactor, those, those two reactors. Not one hiccup. Power flowing, nothing whatsoever happened because that Hurricane hit it dead on. That is impressive. That is why I will thank you for that.

My questions for you, Mr. Atkins and Mr. McGinnis, by law any nuclear material that is used for atomic energy must be mined and enriched here in America. And while current projection indicates that this is not a problem in the future, the declining uranium industry and mining could make this a problem down the road.

How are DOE and NNSA considering these long-term material needs given the short-term outlook for domestic nuclear fuel?

Mr. McGinnis, Mr. Atkins, who wants to start off?

Mr. Atkins. Well, I can certainly address that question as it relates to the use of uranium for the national defense mission. And that is, that is all uranium needs to be U.S. flagged, as well as produced with only U.S. origin technology. So, we cannot use uranium that has been processed with foreign technology for our weapons program.

Mr. Olson. Mr. McGinnis.

Mr. McGinnis. Thank you again. I would like to just reinforce that the nuclear energy sector in this country is seen by this Administration as a national security issue. These are -- the role of nuclear energy plays a key role in our nation=s energy security and broader.

I would say that clearly extends to the health and viability of our nation=s nuclear fuel supply sector. And that certainly extends to the uranium mining sector. We want to do everything we can to support a market that provides the opportunities for

the uranium miners in the United States to prosper and compete, particularly against state-owned enterprises that are coming in, whether it is Kazakhstan or others.

It is a highly competitive market. And as you likely well know, our nation=s American-owned uranium mining sector is in a very, very challenging moment.

Mr. Olson. Yes, sir. You read my mind, too, sir. As you mentioned, President Trump put out the National Security Strategy of the United States of America. He issued that in December of this past year. And it states, and I quote, AThe United States will promote policies and incentives that return the key national security industries to American shores."

And at the same time, the United States can no longer build a nuclear reactor using only U.S.-made parts and U.S.-owned technology which, as you mentioned, is required by law. Is it critical, to the whole panel, we make our technology and equipment here in America with American ownership? And how should we view a Aglobal" marketplace?

Mr. McGinnis, first shot.

Mr. McGinnis. First I want to say that the White House is conducting a nuclear policy review per the direction of the President, and certainly is looking at the full breadth or our nation=s nuclear energy sector, again, for the purpose of revitalizing and expanding our nuclear sector, and that includes the fuel supply.

I can tell you that in my view, not just the national security side, from an energy security side I think it is very important that we have a healthy, robust U.S. nuclear supply sector. And in the export market it is particularly important that our leading companies that sell reactors and other services overseas they are, that they are in a position to be able to partner with U.S. nuclear fuel suppliers to pair with the reactors.

Mr. Olson. The disaster in India, we built the reactor and went to -- I see you are kind of shaking your head down there. Mr. Atkins, your comments about a global nuclear marketplace?

Mr. Atkins. Well, I think it certainly is important fo the defense mission that there is a strong and competitive domestic nuclear industry. There are clearly benefits on both sides. For the defense material, it really needs to come as a solution for our additional needs for uranium, really need to come from the government programs.

We are, as I have mentioned, we are pursuing a domestic enrichment capability that will meet our needs for tritium production by the tritium need date of 2038 to 2041. That is a high priority for the department. But we are also looking at how that capability can also serve other needs, including commercial needs, such as needs for ISA uranium for research reaction, research reactors and medical isotope production, as well as a future need into the 2040s for HEU for naval propulsion.

Mr. Olson. Thank you, sir.

I saw the chairman has his figure on the trigger there to shut me off. So, Mr. Owendoff and Mr. McCree, please answer that question for the record.

And, Mr. Chairman, I yield back by saying everybody in this room should know it has been 98 days since my Houston Astros have become the world champions. With all due respect to Mr. Doyle, that is two -- 96 days more than your Eagles have been champions.

So I yield back.

Mr. Doyle. I am not an Eagles fan. I am a Pittsburgh Steelers fan. Let us get that, that straight.

Mr. Upton. Mr. Green.

Mr. Green. Thank you, Mr. Chairman. I want to thank you and the ranking member for holding the hearing today.

As Hurricane Harvey hit our districts in South Texas, the South Texas Project and Nuclear Plant based in Bay City was hit, too. Despite how rough the hurricane was, workers weathered the storm at the controls and kept the lights on for over two million people in the Houston area.

Workers at the plant managed to convince a local grocery store manager to open up to replenish supplies, and ran to Walmart to buy $2,000 worth of underwear, clean socks, and other essentials for plant workers who could not get back to their flooded homes, and worked in rotational shifts throughout the multi-day storm. I have no doubt that the loss of the power would

have occurred without this, and would have led to even a more tragic loss of life and destruction in the storm=s path.

Nuclear also often gets a bad rap, especially when it comes to natural disasters. South Texas project as recently as 2011 was going to expand to build two new reactors on site. After Fukushima disaster, funding evaporated. And I look forward to talking with our witnesses today about the importance of nuclear energy and what role it is to play in the grid of the future.

Mr. McGinnis, in your testimony you talk about the upcoming civil nuclear review. What are some of the general ideas we can expect to see when it comes to ways to revive and expand -- revise and expand nuclear power?

Mr. McGinnis. Thank you very much. In multiple ways concurrent and not waiting until a nuclear policy review is completely done, we have a challenging time in our nuclear sector. As indicated, it is at an inflection, if not tipping point. I think to the great compliment of the White House we have been told clearly at the Department of Energy, take actions now as far as ways by which we can support reviving and revitalizing and expanding the nuclear sector.

So, with regards to the current fleet, with regards to South Texas Power Plant, it is a critical, vital asset that we can rely on 24/7, rain, sleet, or snow. So, we are very, very proud of the workers, of the dedication of that nuclear power plant during the most important time to provide power to the residents. Very

proud of that.

And that only, in my view, serves to reinforce how important it is with our all-of-the-above strategy that we support a continued vibrant nuclear sector to complement the other generating sources in our electricity grid mix.

Mr. Green. Well, and coming from Texas it is, you know, with the natural gas so cheap, and if you just economically look at it, but that power plant provides about 20 percent of the power in our area. And we could always use additional stationary power that would be good for 40 to 50 years.

How close are we seeing small modular reactors as a mainstream possibility? And how could that revolutionize the nuclear industry?

Mr. McGinnis. Thank you. Very close, in my view, sir.

As indicated, NuScale represents probably the most mature, from a deployment perspective, of those advanced light water reactor small modular reactors. That is one reason why we have invested in a technical partnership with them.

2026 is, again, an important target date. As indicated in my testimony, in my remarks, we are facing, in my view, a cliff sooner than we thought with regards to the, the drop in our fleet of reactors at 20 percent. And we are facing now a very possibility, real possibility of having a dramatic reduction from 20 percent dramatically down by the end of the 2020s. So it is very important that we see these new advanced SMRs coming in the

pipeline and coming into market by the late 2020s. 2026 is the right time.

I want to also mention microreactors. Those have tremendous promise. They are smaller generation, 2 to even as high as 30 megawatts electric, but they are very exciting, very promising. And there are, in fact, a couple of them; one in particular that we are communicating with that has plans of potentially deploying its first microreactor by 2021 or 2022 in the United States.

Mr. Green. Okay. Can you talk, can you talk a little bit about the non-LWR technologies are different from typical reactors? And how is the application process different for these reactors?

Mr. McGinnis. Yes, indeed. We are actually funding, partnering with a number of non-light water advanced reactor companies in the United States that are really leading the world in advanced technologies. The applications go well beyond electricity generation.

We are talking about gas-cooled high temperature reactors that offer applications for petrochemical, for hydrogen production, and other hybrid generation. We have other designs such as molten salt. We have TerraPower with Southern developed. TerraPower is a company partly owned by Bill Gates. They are working on a molten salt design that has very promising non-electric application. Certainly sodium-cooled fast reactors, we have deep experience in that.

So, essentially those are game changing. Once they, and hopefully they do get proven out, and then suddenly we will have a much broader opportunity to apply the nuclear reactors to non-electric applications.

Mr. Green. I yield back what time I don=t have.

Mr. Olson. [Presiding.] The gentleman yields back. The chair now calls upon the heartbeat of Ennis, Texas, the vice chairman of the full committee, Mr. Barton, for five minutes.

Mr. Barton. I am sure that some people in Ennis would dispute that. But I appreciate it.

Anyway, I am not sure who to ask these questions to because I am going to go a little bit off the purpose of the hearing. Mr. McGinnis, or Deputy Principal Secretary McGinnis, I guess is the highest ranker. So I am going to go with you. But if the others think it is your question, feel free to step in.

Secretary McGinnis, can you tell me how many dollars rate payers have paid into the high-level nuclear waste disposal fund since its inception?

Mr. McGinnis. I want to give you the exact number, so I have to get back with you on that. But certainly it is very substantial. And the Nuclear Waste Fund is in the $30 billion, I believe $30 billion range, but that includes interest.

Mr. Barton. My number is $35 billion. But $30 billion is a big number. So that is good.

Can you tell us how many of those dollars have actually been

spent for high level nuclear waste disposal? Again, I don=t need the exact number, just a general number.

Mr. McGinnis. I will definitely have to get back with you because I don=t want to give an inaccurate number. I can tell you that the Office of Nuclear Energy right now has a very, very minimal number, in the single digits in millions, maybe.

Mr. Barton. Yes, it is not 35. It is well below 30 to 35 billion. It, no matter how you do the accounting it is a small number.

Mr. McGinnis. Yes.

Mr. Barton. You could even say zero and it wouldn=t be too far off the mark.

Is the department aware that this subcommittee and the full committee passed a bill to break the impasse on that? And it passed the full committee 49 to 4, and it would allow for interim storage. It would allow for spending for a permanent waste depository. It would allow for the licensing process to go forward for a yes or no answer at Yucca Mountain.

That bill has not been scheduled for floor time yet. And it hasn=t gone to the floor because the appropriators have, in their infinite wisdom, spent the $35 billion that was deposited in the Waste Fund, for other purposes. And that may or may not have been a good thing to do at the time. But the fact remains that the bill that passed out of this committee is a long-term permanent solution, bipartisan. And we are now at an impasse

with the appropriators because they claim they don=t have any money to fund high level waste disposal, and don=t want to agree to a long-term funding profile.

Is the department aware of that problem?

Mr. McGinnis. We are aware of the legislation. And I would like to, respectfully, just emphasize that we submitted $120 million not only to resume the license application, but also for the initiation of a robust interim storage program.

Mr. Barton. Well, you know, the expert on this particular issue is Congressman Shimkus on our side. So but I want to ask could you use your good offices to encourage the department, the Trump administration to help come up with a solution on funding on a long-term basis so we can get this bill to the floor and then to the other body, the other body being the Senate.

I have been here since >85. I was in the department in 1982 when the High Level Nuclear Waste Disposal Act was passed. And I would like to still be in Congress when we actually fund it. And as your current secretary said famously back in Texas, let=s get on down the road.

So, can you encourage the department and the Trump administration to help us find a solution to this funding issue, please?

Mr. McGinnis. I and my colleague at the Department of Energy will do our very best. And also as the secretary said, it is very important that we stop kicking the can down the road.

Mr. Barton. All right, thank you. And with that, I yield back, Mr. Chairman.

Mr. Olson. The gentleman yields back.

The chair now calls upon a fan of Terry Bradshaw, not Ron Jaworski, Mr. Doyle for five minutes.

Mr. Doyle. Thank you, Mr. Chairman.

It is clear to me that the nuclear energy industry is critical to our country. It provides us reliable baseload power with no carbon emissions. It provides thousands of good jobs around the country. And it=s a vital component of our national security.

And I share the opinion of many analysts and energy experts who believe that we can=t lose this source of energy if we have any hope of meeting our Paris emission targets. It is clear that we need to do more to bolster this ailing industry, so I am glad we are having this hearing today. And that would include holding a formal hearing on H.R. 1320, which I worked on with Representative Kinzinger. And I would like to thank him for his leadership on this issue. And I hope this committee can hold a legislative hearing on it soon.

Mr. Atkins, I want to ask you about the 123 Agreements. Your testimony highlights the role that your agency has in these agreements. And given the existing market issues for nuclear power here domestically, it seems like international markets will be critical for maintaining a strong nuclear industry in the United States.

I just want to know, do you feel that there is adequate cooperation and communication between the range of federal agencies required to draft these types of agreements?

Mr. Atkins. Thank you for that question. You know, we, our position is that the U.S. still has the best technology available. And we want to facilitate access to global markets. We do work very closely with the Department of State and other agencies that are involved with 1 -- the negotiation of 123 Agreements. And we believe that this relationship is very productive.

We most recently have negotiated, finished negotiations with Mexico in 2016. And that agreement is currently in the White House for final review.

And we are in the process of negotiating with the United Kingdom, too, on a new 123 Agreement for peaceful nuclear cooperation with them that would replace the existing agreement as they pull out of the European atomic energy community.

So there is a lot going on in this space. And we, we do invest quite a bit of time and effort. And we are confident that we have the right team to push this forward.

Mr. Doyle. Yeah. And just following up, many of these 123 Agreements and standards were drafted at a time of American dominance in the nuclear sector. And as you know now, the field has many more international players. How does NNSA view these developments in consideration with the existing 123 Agreement

process?

Mr. Atkins. I think we, we continue to be committed to, to see, you know, these 123 Agreements go forward with the, the best non-proliferation standards that are possible. But I think that there is an attitude of realism, and that we, we have to balance the importance of ensuring that our industry is able to compete and not withheld from these markets.

So, so there is certainly consideration given to changes in the environment, and we adjust our policy accordingly.

Mr. Doyle. Thank you.

Mr. McCree, the current NRC funding structure requires fee payments from existing or operational plants that make up about 90 percent of the NRC budget. With the dramatic increase of premature retirements are you concerned about the sustainability of this existing structure for your agency=s budget?

Mr. McCree. So, thanks for the question. A I indicated in my testimony, we are committed to ensuring that our fees are, and our fee process is clear; that the fees are fair; and that the process is transparent. And to that end, regarding potential shutdowns of operating nuclear power plants, one of the first things that we do is adjust our budget as the plant goes into decommissioning to reflect the lower amount of work that we anticipate as a plant goes from an operating status into a decommissioning environment.

That is, essentially then that helps to minimize the burden,

if you would, of the costs that would convey to the rest of the industry.

We are also engaging in additional activities, again from a fee fairness standpoint, that I believe would give additional balance in the area. So, we are interested of course in, again, making sure that there is clarity, and fairness, and transparency. I wouldn=t characterize it as a concern.

Mr. Doyle. Mr. McGinnis, I was encouraged to read your strong support for the nuclear industry. As you explain in your testimony, it provides 60 percent of the nation=s emissions-free electricity. However, when you look at the fiscal year 2018 budget request we received, it features a $283 million cut from fiscal year 2016 levels. The request went from just under a billion down to 730 million.

So, while I appreciate the emphasis the department has placed on early stage R&D, and your openness to advanced nuclear, your testimony and the budget request seem contradictory. Should we anticipate a revised request in this year=s budget request?

Mr. McGinnis. Thank you very much. It would be premature to speak about the request. That is going to be rolled out next week. Hopefully, you will see some positive aspects of that in our budget request.

But having worked in the Office of Nuclear Energy for 11 years, I can say one thing emphatically, and that is there have been many, many bright, capable leaders in the Office of Nuclear

Energy and industry that have attempted to support the nuclear sector in a manner that is going to change from this downward trajectory, this tipping point, back to an upward growth.

And, frankly, we have not succeeded. We are witnessing an historic downward trend right now. Whatever we are doing, it is not enough.

So I would just like to respectfully say what I have done in my office is taken that to heart and asked ourselves not just a function of additional funds, but what are the things we are missing? What are the things that we can be doing, at least on the federal side?

We can make our facilities, Idaho National Lab, advanced test facilities that companies could never hope to pay for and build themselves, make it more user friendly. We have another approach where we are -- we have a funding opportunity announcement with industry. We have already announced it. And we are getting strong responses.

The intent for that is to get away from the Federal Government or DOE, Office of Nuclear Energy, trying to pre-judge what the most important space for the Department of Energy to be in in partnering with the nuclear companies, and let them propose to us where the specific highest impact areas are.

So I am excited about some things that we are doing that is even beyond just the function of the actual level of budget, which I think is necessary. We need a robust budget.

Mr. Doyle. I see our chairman has been hitting his gavel for quite some time. So I thank you, Mr. Chairman.

Mr. McGinnis. Thank you.

Mr. Doyle. I yield back.

Mr. Olson. The gentleman yields back. The chair now calls upon the chairman of the Environment Subcommittee, Mr. Shimkus, for five minutes.

Mr. Shimkus. Thank you, Mr. Chairman. I appreciate Joe Barton=s comments, so I am going to get -- I want to prove that I am not a Johnny One Note on closing the nuclear fuel cycle and I=m going to go with some different areas.

Ostendorff for sure will appreciate this from a simple infantryman. So we mine uranium, we process it into yellow cake, we convert it into UF6. That is what happens, and we would like for it to be happening in Metropolis, Illinois. We enrich it to U-235. And then we use it for fuel, civilian reactor fuel. We use it for our Navy fleet. And we use it for our weapons.

So my question goes on the bartering process which kind of undercuts this process and I believe really hurts the chain, the fuel chain development, and threatens it at the most. So, Mr. Owendoff, what is the Administration doing to help move funding for its important cleanup missions to be fully appropriated by Congress?

Mr. Owendoff. Sir, thank you for the question. Certainly barter has been an important part of the cleanup at the Portsmouth

site. Last year, in May of 2017, the secretary reduced the amount that we would barter from 1,600 metric tons a year to 1,200 metric tons a year. He is --

Mr. Shimkus. So let me just quote. Is the Administration doing anything to move this to an appropriations process to help fund these cleanups versus its bartering process? That is the basic question.

Mr. Owendoff. Sure. We did that last year, sir, in 2017.

Mr. Shimkus. Well, you are diminishing it.

Mr. Owendoff. Yes, sir.

Mr. Shimkus. The question is are you moving it, are you asking to move it to an appropriations process away from a bartering process?

Mr. Owendoff. I believe that we have, we have done that. It is --

Mr. Shimkus. Why don=t you just come and talk to me about the issue.

Mr. Owendoff. Yes, sir.

Mr. Shimkus. Obviously it is important.

Mr. Owendoff. Sure.

Mr. Shimkus. Mr. McGinnis, can you provide an update on the status of DOE=s revision of its uranium management plan?

Mr. McGinnis. Yes, indeed. In fact, we are towards the tail end of revising the uranium management plan. And we intend to then put it out into the Federal Register notice for public

input.

And, again, one of the things that I worked in my early years in the Office of Nuclear Energy was the initial development of the uranium management plan back in 2008 or so. I believe it has been very valuable in showing transparency and the full sweep of nuclear transfers that the Department of Energy is engaged in.

Mr. Shimkus. Let me follow up on a comment you made about a concern about possible state actors undercutting our production in the future. We have got this administrative review going on to figure out what happened in December with the suspension of the agreement on uranium from the Russian Federation. There are many of us who are concerned that, just like any trade issue, if it is unfair trade, if it is subsidized by a government entity might be good for lower prices but not good for the U.S. manufacturing sector. And that is what we are talking about, manufacturing fuel for this.

Can you, will you provide an update on the expected timing of this review and DOE=s role as part, your role in this process?

Mr. McGinnis. Thank you very much. The Department of Commerce is the lead for the Suspension Agreement and the oversight and enforcement of that agreement. There is a second action that was recently submitted to Department of Commerce by the Uranium Miners= Assoc -- or uranium miners who are petitioning a separate but ultimately possibly related issue from

a sector issue.

We work very closely with the Department of Commerce. In fact, we met with them yesterday on these very issues. So they look to the Department of Energy as experts to provide important --

Mr. Shimkus. Okay, let me -- and I don=t -- just because of time, we will talk with the Department of Commerce and follow up on that.

Mr. Atkins, does the NNSA have any issues involved in this discussion with Department of Commerce on this agreement and the review?

Mr. Atkins. We, given that the Department of Commerce has the lead, we certainly are working closely with them to ensure that the national security interests are represented in the investigation, certainly.

Mr. Shimkus. What does that mean in English?

Mr. Atkins. It means we are working with the Department of Commerce. They are in the lead on considering the petition, and we are representing what are the implications for the national security issue.

Mr. Shimkus. Let me finish with Mr. McGinnis.

I have also been involved with Eastern European issues. And obviously NUCON Power being built, and the Russians building. And we are not building. What happens to our lead if other countries aren=t looking for us to help build nuclear power

plants?

Mr. McGinnis. Thank you for the question. A lot happens, both in the export and also the national security space. In my view -- and I will defer to Mr. Atkins to elaborate -- but again, as having led the international export support for nuclear energy for 11 years I can -- I have worked very closely with the Russian exporters, with the Chinese exporters, and others. And when they win these reactor deals, there is no U.S. content in these reactors, period.

So, the contracts that are written that directly, most determinatively lay out an agreement on the control of the materials is being determined by that supplier. And it is not American companies in these cases.

Mr. Shimkus. Let me help my chairman out. Thank you.

Mr. Olson. The gentleman yields back. The chair now calls upon the gentlelady from Florida, Ms. Castro, for five minutes -- Castor.

Ms. Castor. Thank you, Mr. Chairman. Thank you to the witnesses for being here today.

The United States has been the leader for decades in nuclear research and in commercial nuclear power deployment. But I have to tell you that folks on the west coast of Florida view nuclear power and its future with a very skeptical eye. And it stems from the fact a few years ago the legislature passed a utility-backed law for advanced nuclear recovery fees. And one

utility commenced to open a new nuclear power plant and also fix one of the older ones.

The fix went awry. And the other plant was never constructed. And yet, the rate payers were on the hook for almost $3 billion, and not one kilowatt hour of energy was produced. And they are still paying those fees.

So I would like to know, Mr. McGinnis, what, what do you say to them? They, they see very high capital costs. They understand the issue of nuclear waste. They understand the natural gas revolution, the low cost of natural gas, the low cost of demand management, the low cost of clean energy and renewables. I think they understand the importance of a diverse energy portfolio and to have carbon-free energy sources.

But net/net, boy, this has not been a good deal for folks in my neck of the woods. What do you say to them about the future of nuclear power?

Mr. McGinnis. Thank you very much. Respectfully, we have 99 reactors operating around the country, as we know; nearly 500,000 jobs directly and indirectly support that very important, high-paying industry. We do see a very, very important role of nuclear.

With regards to specific commercial projects in specific states, ultimately these are issues that are determined and driven largely by the companies, by the regulators, by the states. And we respect that. Certainly we want to see healthy, viable plants,

construction start and see-through, and return that investment to the rate payers. That is what we want to do.

But to the extent to which the Department of Energy can play a role, we are working in our wheelhouse, which is research and development, and we are working with companies, utilities or for the purpose of developing technologies that can support better economics, more efficiency, with strong safety. We are doing our best in our arena. And we certainly want to see healthy, successful nuclear projects, just like the all-of-the-above with other energy projects in this country.

Ms. Castor. Do any of the other witnesses have a comment and what you would say to rate payers that, you know, trying to convince them that, yes, this is important for the United States Congress to prioritize nuclear energy over other investments?

[No response.]

Ms. Castor. Okay. Mr. McGinnis, some of the other witnesses in their testimony have said that the Department of Energy, while it is positive that they have $30 million on the street for early stage R&D in the development of small modular reactors, that really the Department of Energy is interested in this but not truly invested in the future. How do you answer that?

Mr. McGinnis. Thank you very much. I think when you hear some of the other witnesses, including the Director of the Idaho National Lab, I think you will hear a compelling reinforcement

of how we are not just interested, we are fully invested. We live and breathe the health and viability of our nuclear sector in my office; I can tell you at the laboratories where they are doing work for us.

So we think, and we are doing --

Ms. Castor. So the laboratories do an outstanding job. I mean this is probably one of the great points of pride for the United States of America, everything that is happening in the national laboratories. What is going on with commercialization, though, and deployment? I think that is probably the criticism.

Mr. McGinnis. Yes. And one of the things we must do is look in the mirror and see our weaknesses, not just our strengths. Our strengths are advanced reactor designs, bar none the most efficient fleet operated in the world; best regulatory body. But what we have to work on is deployment. We have, obviously, gone for decades without building a reactor until we see what is happening in Vogtle.

We have much to look back and see what we can do to improve. We have a lot to work on in the space where we can actually take research and development, make our laboratory capabilities accessible to the utilities, such as advanced tolerant fuel -- accident tolerant fuels. That could be a significant impact on the economics.

But what we are trying to do is take our laboratory capabilities, which the -- which my office largely

significantly funds, and make those capabilities available to industry as they move forward.

Ms. Castor. Yield back.

Mr. Olson. Time has expired. The chair will now call upon the gentleman from Ohio, Mr. Latta, for five minutes.

Mr. Latta. Thank you very much, Mr. Chairman. And thank you very much for our witnesses for being here. And before I get to my questions I would also like to begin by repeating what the witnesses= comments about the importance of nuclear power.

I have been in support of nuclear power because I believe it is important for our energy mix and our national security. I also believe it is important that we take the entire supply chain, including the communities that support nuclear power plants into account. I want to think about how nuclear power impacts our energy and security.

We must continue to work to ensure that the U.S. remains on the forefront of nuclear innovation, and this has to involve a discussion of our current fleet, as well as the future of nuclear in this country.

And if I can start with you, Mr. McCree. In December, the NRC released a report titled AA Regulatory Review Roadmap for Non-Light Water Reactors," which provided a list of options available for NRC to review both pre-application and formal applications for advanced nuclear technologies. I appreciate NRC=s leadership to work through some of the policy challenges

associated with licensing of advanced nuclear designs.

Mr. McCree, what do you view as the most critical issues to resolve as part of your regulatory review of non-light water reactor efforts to provide some certainty to the stakeholders?

Mr. McCree. Congressman, thank you for the question. The document that you reference, the Regulatory Review Roadmap is actually one of the seven items -- seven activities, rather, that we explicitly identified in our, as part of our new term strategy to address the three objectives that I mentioned in my opening remarks: optimizing our regulatory infrastructure; our technical infrastructure; and our communications.

It outlines literally a roadmap, an approach from the research and development through the conceptual and preliminary, and then the final stages of design and development for an advanced non-light water reactor, with an approach that, that is more flexible, that is staged. That is terminology that both the industry, the DOE, and the NRC understand to provide greater predictability, efficiency, transparency on what comes next; when and how to engage the regulator in these advanced non-light water reactor designs.

That is a key step. There are other important deliverables in the near term, including identifying the design criteria, if you would, the current fleet of plants where most were developed using a general design criteria in our regulations. We need to adapt and identify design criteria that support non-light water

reactor designs.

The DOE developed a document, Principal Design Criteria, and we have used that to create a draft of design criteria for these same reactor designs. So that, and other activities are explicitly identified in our plan as we are moving forward.

Mr. Latta. When we look at that plan, and with the initiative, what do you think is going to be the most challenging part for the NRC as you move forward?

Mr. McCree. Well, again, I am hesitant to identify one that is most challenging. I think all are achievable. And we developed the interfaces with the DOE and with the industry, with the applicants to work through a full range of issues.

There are policy matters that we will engage the Commission on, one of which already from the emergency preparedness perspective we have already issued the regulatory basis for that. There are other issues associated with the siting and with security that need to be engaged, again, from a policy perspective.

Again, all are achievable activities, and just we are just applying continued effort to progress on them.

Mr. Latta. Okay. Let me follow up with one other question if I may with you. The NRC under existing statute must recover approximately 90 percent of its fees from licenses. NRC currently bills its licensees or applicants about $263 per hour, which is a high burden on companies seeking to develop new nuclear

technologies.

The Advanced Nuclear Technology Development Act, which I authored, authorized limited funding outside of the fee base for the development of certain generic regulatory activity to help facilitate new technologies. And there will be a witness on the second panel today that proposed reforming the fee structure for new reactors.

Has NRC explored reforms to its fee structure to allow more predictability in its fee collection to help assure we nurture the domestic nuclear innovators and with some flexibility along with that?

Mr. McCree. So as I indicated in my opening remarks, we are certainly interested in our fees, our fee structure being clear, more transparent and fair. And that would apply to advanced non-light water reactor vendor applicants as well. So they will benefit from the improvements that we make in this area as well.

Mr. Latta. Well, thank you very much.

And, Mr. Chairman, my time has expired. I yield back.

Mr. Olson. The gentleman yields back. The chair now calls upon the gentleman from the Empire State, Mr. Tonko, for five minutes.

Mr. Tonko. Thank you, Mr. Chair. And thank you all for being here.

Mr. Owendoff, you mentioned the Separations Process Research

Unit, their cleanup -- which is in my district -- in your testimony. SPRU demonstrates how difficult, long and, indeed, expensive these cleanups can be. I appreciate the office=s attention to the site, but I know there are many of these sites from the 1940s and 1950s around the country that also need funding and remediation.

Similarly, the majority=s memo mentioned Congressman Reed=s bill on the West Valley Demonstration Project. I support this approach, and hope this is something the committee can more fully consider in the future. But I would also like to stress that this should be done in regular order. I hope the majority might be interested in examining that issue further.

The work being done to research and develop advanced nuclear technologies, such as small modular reactors, is incredibly important. We need new nuclear reactor designs that produce cost-competitive electricity safely. It is critical for making major reductions in greenhouse gas emissions. But this cannot be done without federal R&D funding. DOE research dollars are at the heart of the United States=s global energy competitiveness.

Mr. McGinnis, can you describe, please, the relationship between the DOE, the national labs, and the private sector in developing nuclear energy research priorities?

Mr. McGinnis. Thank you very much. The relationship is very strong. We work, obviously we -- the majority of our funds that we apply to our research and development go to our

national labs, such as Idaho National Lab, Oak Ridge National Lab, and others. We are pushing the envelope, trying to be more innovative.

So we are really putting a value on having all the leaders -- industry, even the universities, national labs -- coming together and working together to go at some of the technical barriers that are preventing or keeping us back from realizing the new innovative technologies in our market.

We also work very closely, again, with the NRC. They have such a key role. And a lot of the technical issues we are attempting to dispatch will directly, in my view, help and benefit the NRC as they go through these reviews as well.

Mr. Tonko. Thank you. And I mentioned the relationship amongst the agency labs and the private sector. What role have the labs, the national labs, played in the development of advanced nuclear reactors?

Mr. McGinnis. Vital roles. Idaho National Lab is a founder in advanced test react -- in advanced reactors. They have, I believe, built over the years 57 or so reactors. And now they are also home to one of our lead test capabilities in the advanced test reactor, and just resuming the transient test reactor, which both of those are unique capabilities for our country.

Mr. Tonko. Thank you.

And our national labs are critical to not only nuclear but all energy innovation. So I would once again urge that the

President=s budget request reflects this and preserves DOE=s energy innovation budget. It is absolutely critical.

I also want to highlight the importance of maintaining a robust, domestic nuclear enterprise from manufacturing, to supply chain, to human infrastructure. Mr. McGinnis or Mr. Atkins, do either of you want to comment on the importance that preserving these capabilities goes to both our national security interests as well as the future of the United States= nuclear energy industry?

Mr. Atkins. From the nuclear security side of things we clearly see an interplay between the domestic civil side and the national defense side. As has been discussed a number of times, there are fewer and fewer operational nuclear facilities in the United States, and certainly our domestic and our ability to have an effective nuclear security program is really reliant on people that have hands-on experience in the nuclear field. And so, having a vital domestic nuclear industry helps us to provide those opportunities for people that may in fact at some point in their careers come back to the -- come to the national defense side.

So, you know, in terms of innovations on both sides, we hope to see some push and pull from this as well. We think that this is a symbiotic relationship that needs to continue.

Mr. Tonko. And Mr. McGinnis.

Mr. McGinnis. Thank you very much. The fact is, reality is we have lost a lot of our manufacturing capability. We want

to take what we are still world class at, advanced modeling and simulation, additive manufacturing, and other innovative approaches we are seeing in the labs and also in industry, take that and what we are calling leapfrogging. We want to leapfrog back into the leadership of manufacturing.

There are promising areas such as modeling and simulation, additive manufacturing, even 3-D printing. Very exciting. We have facilities in the northeast and others commercially; we are partnering with them.

So I think we have a real impact opportunity in that arena.

Mr. Tonko. Thank you. And with that, Mr. Chair, I yield back.

Mr. Olson. The gentleman=s time has expired. And the chair calls upon the gentleman from the Commonwealth of Virginia, Mr. Griffith, for five minutes.

Mr. Griffith. Thank you very much, Mr. Chairman.

Mr. McCree, some nuclear technology companies are looking to the Canadian or British nuclear regulatory bodies to help advance a regulatory model for advanced reactors. What lessons can be learned from looking at fellow regulatory bodies? And is there a role for the NRC to partner with those governments to provide a standard roadmap amongst our allied countries?

Mr. McCree. Congressman, thank you for your question. Regarding partnerships, as I alluded to at a high level in my opening remarks, we at the NRC have a very robust relationship

with our international regulatory counterparts. You mentioned the Canadians, and particularly the Canadian Nuclear Safety Commission is our regulatory counterpart. I am very familiar, actually, with their -- with my counterpart there. We serve on several committees together, and have engaged as recently as August. I was in Ottawa engaging in conversation with several other regulators and the Nuclear Energy Agency about cooperation on small modular reactor, in the area of small modular reactors, which I believe can bear fruit.

Of course, there would need to be, as we have concluded, a common, some commonality in the types of reactor designs that are being reviewed respectively for us to have some mutual and synergistic sharing. I see that happening. I know the Commission is, of course, interested in that as well.

With the recent announcement by NuScale of potential pursuit of vendor design review by the Canadians, there is certainly that opportunity perhaps in the near term with NuScale. And, again, I believe it would be synergistic. We won=t just learn from them. I would venture to say that there is great opportunity for them to learn from us as well.

Mr. Griffith. I appreciate that. Thank you very much.

Also, when was the last time that the NRC operated with a full complement of commissioners, do you know?

Mr. McCree. Congressman, I have to take that for the record.

Mr. Griffith. No, I understand.

Mr. McCree. I believe it is -- I wouldn=t speculate, but I believe it has been well over a year ago that we had a full commission.

Mr. Griffith. And it is better if you have a full commission, isn=t it?

Mr. McCree. I certainly enjoy the commission that we have today. And have actually served in the agency long enough to have seen the full commission work very well. And when we were less than a full commission we were similarly effective. But, again, I believe we would look forward to having a full commission.

Mr. Griffith. Is there an incentive to have five? I think you are operating currently with three.

Mr. Ostendorff, you served as an NRC commission in varying compositions, is a full slate of five a little bit better than three? Are five minds better than three?

I won=t go to Mr. Ostendorff, put him on the spot this time.

Mr. Ostendorff. Let me help you out. I was there as a commissioner from 2010 to 2016. I think the last time there were five commissioners there was in 2014.

And I can speak, for a diversity of view and collaboration we are always better off with five commissioners than three.

Mr. Griffith. I appreciate that. Thank you. I do appreciate that as well.

Now, I will shift down with what little time I have remaining to Mr. McGinnis. You talked earlier in some of the questions

to -- that Mr. Shimkus asked, we talked about the impacts of having to import our uranium, et cetera. What is DOE doing? I got all that you are working with the Commerce Department. What is DOE doing with trying to make sure that we make mining of uranium in the United States safe?

Because just outside of my district there is a big rock of uranium that the state of Virginia has been hesitant, for safety reasons, to allow the mining of. So what are we doing from DOE=s perspective to make that better?

Mr. McGinnis. Thank you very much. The Office of Nuclear Energy at the Department of Energy really does focus on research development within the fuel cycle. It does include front-end extraction issues.

With regards to regulatory oversight, that would be beyond my office. Always stand ready to provide input, but certainly those are, those are issues, responsibilities that fall under other agencies and other programs.

Certainly can take that for the record and get you more information, if you would like.

Mr. Griffith. I would appreciate that very much. I think the folks over in Pennsylvania County would appreciate it, too, because there is a big asset sitting there that rightfully they are concerned about mining. But at the same time, it is estimate seven to eight years ago was it is a $12 billion rock sitting there. Might be nice to get to it.

I yield back, Mr. Chairman.

Mr. Olson. The gentleman yields back. The chair reminds all members there is no panel jumping.

The chair now calls --

Mr. Griffith. In all fairness, Mr. Chairman, that was my fault. I can=t blame that on them.

Mr. Olson. The chair now calls upon the gentleman from Ohio, Mr. Johnson, for five minutes.

Mr. Johnson. Thank you, Mr. Chairman, I appreciate it.

You know, I have been drafting legislation to improve the efficiency of the approval process for what is known as the Part 810 authorization. And I am eager to introduce it once we get it finalized.

At our recent subcommittee hearing with both -- with senior DOE leadership, both Deputy Secretary Brouilette, and then NNSA Administrator Klotz, assured me that U.S. civilian nuclear industry engagement in the global market is priority for this administration. Information we have received from DOE, as well as recent reports from the Nuclear Innovation Alliance, detail longer review times for certain projects, and additional delays within the inter-agency approval process.

So, Mr. Atkins, let me ask you about a couple of specific issues related to this. The previous Administration=s DOE reversed a longstanding policy which allowed the secretary to delegate signature authority for certain authorizations as a

result of a more strict interpretation of the Atomic Energy Act. Do you know if the current Administration is looking at changing that policy?

Mr. Atkins. Sir, at this time the general counsel has continued to stand by their interpretation of the Atomic Energy Act, that the Secretary of Energy cannot delegate that.

Mr. Johnson. That wasn=t my question.

Mr. Atkins. We are not considering.

Mr. Johnson. Okay. So you are saying that you are going to, right now you are going to stay with the interpretation of the previous Administration? You are not looking at reviewing or changing that?

Mr. Atkins. We are always looking to, to review ways to increase the speed of reviews. But my understanding is that we are not looking at delegating that authority.

Mr. Johnson. Okay. Would the Administration consider a statutory clarification to be helpful in this regard?

Mr. Atkins. The understanding is that it would require a legislative change to change that, and that we would certainly be interested in working with Congress on that.

Mr. Johnson. Okay. Under the Bush administration I understand that the Energy secretary would receive the authorization package from DOE staff, which the secretary could approve contingent on receiving the necessary assurances from the State Department that are required under the Part 10 --

1988 810 rules. However, now, currently DOE waits on the entire
1989 approval package in a sequential manner, which has increased the
1990 length of time for companies seeking DOE sign-off.
1991 Will DOE consider returning to the more efficient process
1992 by which the secretary can sign off on an authorization ending
1993 the sign-off by the State Department?
1994 Mr. Atkins. I think that the short answer, I will give you
1995 the short answer here: yes. I think we are willing to reconsider
1996 that and are reconsidering that. The long review time is really
1997 this international non-proliferation assurance requirement that
1998 we have. But we are willing to do whatever we can to shave
1999 whatever time that -- time off the review that we can.
2000 Mr. Johnson. Okay. I will look forward to working with
2001 you on that.
2002 Acting Assistant Secretary of Nuclear Energy Mr. McGinnis,
2003 as noted in the 2018 Nuclear Posture Review, the U.S. has no
2004 ability to enrich uranium with domestic technology for either
2005 national security or commercial purposes. What steps is DOE
2006 taking to restore domestic enrichment capability for our nation?
2007 Mr. McGinnis. Thank you very much. Very important
2008 question. And my colleague Mr. Atkins can talk to the national
2009 security side, which is a very, very important driver for looking
2010 at reconstituting or establishing enrichment capacity for our
2011 country.
2012 From a nuclear energy perspective, I can tell you that the

issue of whether or not we -- there should be other actions taken to support reestablishing American-owned commercial enrichment, those issues are also being looked at. It is part and parcel of the nuclear policy review that is being conducted as well right now.

But I do think you might find it useful to hear, on the national security side, what is driving the examination of possible enrichment capacity or planned enrichment capacity for national security reasons.

Mr. Johnson. Mr. Atkins.

Mr. Atkins. This really comes back to the requirement for tritium production for the national defense needs. Really, there is no commercial alternative at this point, given that, one, there is no commercial enrichment capability domestically, and also the prevalence of foreign, the use of foreign technology in the field.

So really the department is, through its Defense Programs Office, is committed to pursuing a domestic enrichment capability for this requirement. We have a series of downblending campaigns that they are ongoing now to meet the immediate need. But we will run out of, the projection is we will run out of enriched uranium at the 2038 time frame. So we have a series of efforts ongoing right now to consider the alternatives for technologies to meet such a need.

Mr. Johnson. Have you looked at any of the studies that

DOE has already done in the previous administration for what the possibilities are?

Mr. Atkins. I can=t speak to that, sir, but I could certainly get back to you.

Mr. Johnson. Okay.

Mr. Atkins. Thank you.

Mr. Johnson. Mr. Chairman, I yield back.

Mr. Olson. The gentleman yields back. The chair now calls upon the gentleman from the Land of Lincoln, Mr. Kinzinger, for five minutes.

Mr. Kinzinger. Right. Thank you, Mr. Chairman. And thank you all for spending time with us and being here.

My district in Illinois has four nuclear power plants, eight reactors, and five, actually, spent fuel storage sites. We all know it provides, nuclear power provides reliable, carbon-free electricity around the clock, even when it is negative 15, like it was at the beginning of the year in Illinois. Nuclear power not only provides good jobs and clean energy, but also represents an opportunity for continued U.S. leadership around the globe. From helping our allies to operating their plants safely -- to operate their plants safely, or having the expertise needed to lead on non-proliferation issues, nuclear power is vital to our nation and to our national security.

I would like to thank my colleague Representative Doyle, who truly recognizes the importance of these issues, and has

worked tirelessly with me on H.R. 1320, the NUKE Act. I truly believe this bipartisan bill is a step in the right direction to help our existing fleet, and also the next generation of nuclear technology.

We will start with Mr. McGinnis and then Mr. McCree. But, first, Mr. McGinnis. The Atomic Energy Act prohibits foreign ownership, control, and domination of U.S. commercial nuclear interests and nuclear plants. In 2016, the NRC budget hearing before this committee, then Chairman Burns said that this prohibition is something that is worth taking a look at. The provision in my bill would do just that by having the GAO report on the feasibility and implications of repealing this provision.

So, Mr. McGinnis, since the Atomic Energy Act was signed into law the U.S. Government has established processes to review national security interests in key sectors, such as the Committee on Foreign Investment in the United States. Would it make sense for Congress to consider alternative policies to review foreign investment in our nuclear facilities?

Mr. McGinnis. Thank you very much. Certainly, the CFIUS process you talked about is extremely important. We greatly care and we very closely watch and monitor foreign investments in nuclear generating assets and companies.

With regards to whether or not there should be additional actions taken, I would have to get back with you on that.

Mr. Kinzinger. But is it worth taking a look at?

Mr. McGinnis. I will certainly get back with you and offer you any suggestions on that.

Mr. Kinzinger. So you can=t tell me if it is worth taking a look at? That is all I am asking.

Mr. McGinnis. Certainly worth -- we welcome Congress= strong monitoring of the situation --

Mr. Kinzinger. Right.

Mr. McGinnis. -- in supporting a robust nuclear industry.

Mr. Kinzinger. I got it. Good work.

Mr. McCree, in an increasingly global market is this restriction worth taking a look at? And if so, what do you think would be the potential impacts?

Mr. McCree. Congressman, thank you for your question. I would offer that the Commission has not taken a position on the proposed legislation and I, so I would not -- it would be inappropriate for me to speak for the Commission.

Mr. Kinzinger. All right. Another provision in H.R. 1320 requests GAO study the impact of eliminating what is known as a mandatory hearing for uncontested licensing procedures. Removing this requirement would allow the Commission, if no affected person requests a hearing, to issue a construction permit and operating license, or an amendment to those permits and licenses without holding a hearing. The NRC has previously informed Congress that it believes amending the Atomic Energy

Act to eliminate the mandatory uncontested hearing on combined license and early site permitting applications could enhance the efficiency of NRC operations.

Mr. McCree, if this requirement were removed, it is my understanding that the Commission would be required to provide public notice of the opportunity to request a hearing. Is that correct?

Mr. McCree. Congressman, I believe you are quoting correctly from previous testimony by members of the Commission. So I would acknowledge that.

I am not aware of any Commission request for similar legislation or similar elimination of the mandatory hearing recently, however. So I would again defer to the Commission on that.

Mr. Kinzinger. Okay. In the licensing review process, what are the public comment opportunities beside the mandatory hearing? Can you elaborate on these?

Mr. McCree. I would need to get back to you for the record on that.

Mr. Kinzinger. I hope you do.

Well, that was quick, I guess, Mr. Chairman. So 52 seconds I yield back.

Mr. Olson. The gentleman yields back. The chair now calls upon a fellow Texan, Mr. Flores, for five minutes.

Mr. Flores. Well, thank you, Mr. Chairman. And I

appreciate the panel for today=s informative discussion.

I believe there is great potential when we look at the opportunities for small modular reactors, and also with innovative next gen designs that have been developed thus far. And am excited about what can come beyond that.

There are a bunch of challenges in front of us that need to be addressed before we -- in order to provide a successful pathway for these new technologies to come to fruition. One issue in particular relates to the availability of what is known as high-assay low-enriched uranium. This specific material, uranium, enriched at higher levels than what is available in the current commercial market, may offer more flexibility and more efficient electricity generation than what we have available today.

There is a recent industry survey of 16 leading U.S. advanced reactor technology developers, found that the lack of access to high-assay LEU ranks at the top of policy concerns that require resolution to move forward with these projects. Just a few weeks ago in front of this subcommittee, DOE Under Secretary Menezes confirmed DOE=s interest in addressing this concern.

So my question is to you, Mr. McGinnis. Are you familiar with this barrier to advanced nuclear innovators?

Mr. McGinnis. Thank you, Congressman. Yes, I am.

Mr. Flores. Can you offer any thoughts about how this can be addressed?

Mr. McGinnis. I can tell you from the nuclear energy sector in particular, those who are working to develop our nation=s next class of advanced reactors, many of those reactor designs will require higher levels of enrichment, as you have indicated, high-assay LEU, which is another way of saying 16, 17, or 18 percent enrichment as opposed to the 4.5 or so percent that our fleet uses now.

We do believe it is a very important issue. It is a supply chain issue. It is an energy security supply issue. And it extends to also the NNSA=s space as well as our advanced reactor deployment plans.

Mr. Flores. In light of that, I assume that the NRC is looking at the policy challenges associated with the material. Is that correct, Mr. McCree?

Mr. McCree. Mr. Flores, thank you for your question. And at this point we don=t see what would represent policy issues. There are a number of technical issues. Mr. McGinnis mentioned some of them. It even goes to the criticality analyses, neutronics that would be represented in the core. From a transport packaging perspective there are issues. And even in the fuel cycle, you know, what enrichment capabilities exist. Would there be a need for new facilities or an amendment to a license at an existing facility, and et cetera?

So there are a number of issues like that associated with the supply chain that would need to be addressed. But that is

more than a technical issue rather than a policy issue.

Mr. Flores. Mr. McGinnis, would a DOE program to manage this material similar to how DOE provides fuel for research reactors be an option?

Mr. McGinnis. To be clear on your question, you are referring to high-assay LEU with research reactors?

Mr. Flores. Yes, that is correct.

Mr. McGinnis. Yes, that is very important supply chain issue as well.

Mr. Flores. Would that be an option to use for these advanced generation nuclear reactors?

Mr. McGinnis. Well, I would rephrase it to say, from my view research reactors, a number of them, have high enrichment fuel requirements as well.

Mr. Flores. Right.

Mr. McGinnis. Higher level. And they will need a supply chain. There is no commercially available higher enriched level available now. And we will have to come to terms with that.

Mr. Flores. Okay. To the extent that Congress wants to take a look at this, I am assuming your office would be willing to work with us to try to develop policy solutions?

Mr. McGinnis. Yes, certainly.

Mr. Flores. Mr. Owendoff, I have 58 seconds left. West Valley Demonstration Project was a commercial demonstration reprocessing technology, but it ceased operation about 40 years

ago. The department is still overseeing the decommissioning and decontamination work at the site; is that correct?

Mr. Owendoff. Yes, it is, Congressman.

Mr. Flores. The last time that the project was authorized was in 1982. Would DOE support legislation to reauthorize this project?

Mr. Owendoff. I think we have provided technical advice in the past. And we will continue to work with you, Congressman.

Mr. Flores. What other issues would need to be addressed if we -- at West, at the West Valley site?

Mr. Owendoff. I think it is a complex issue. So if we can, for the record, work with your office, sir.

Mr. Flores. Okay. You can do that supplementally after the hearing.

Mr. Owendoff. Yes, sir.

Mr. Flores. Okay, thank you very much. I yield back.

Mr. Owendoff. Yes, sir.

Mr. Olson. The gentleman yields back. The chair sees no member seek to ask questions, so on behalf of the committee thank you to the first panel. I will remind our members they have ten legislative days to submit questions for the record and, to all the panelists, you have ten days to reply to those questions.

Thank you, thank you, thank you. You are dismissed.

Panel two, you are up. And be advised that a vote is coming up sometime next 45 minutes, so please be expeditious. Thank

you.

You all have had your water. Are you ready to rock and roll? Okay, the second panel is starting.

Our first speaker with an opening 5-minute statement will be Bill Ostendorff. He has been on the first panel, but he is also Distinguished Visiting Professor of National Security at the United States Naval Academy. Go Navy. You have five minutes, sir.

STATEMENTS OF HON. BILL OSTENDORFF, DISTINGUISHED VISITING PROFESSOR OF NATIONAL SECURITY, U.S. NAVAL ACADEMY; MARK PETERS, DIRECTOR, IDAHO NATIONAL LABORATORY; MARIA KORSNICK, PRESIDENT AND CEO, NUCLEAR ENERGY INSTITUTE; DAVID TRIMBLE, DIRECTOR, GOVERNMENT ACCOUNTABILITY OFFICE, NATURAL RESOURCE AND ENVIRONMENT; AND ASHLEY FINAN, POLICY DIRECTOR, NUCLEAR INNOVATION ALLIANCE

STATEMENT OF BILL OSTENDORFF

Mr. Ostendorff. Thank you, Mr. Chairman. I must acknowledge my friend Congressman Shimkus here, and congratulate him on the Army-Navy victory back in December. I would be remiss in not doing so.

I thank you for the chance to be here today. While I an currently a professor of National Security Studies at the Naval Academy I am not here on behalf of the Navy. Rather, I am here to speak of my experience in submarines, in the nuclear weapons programs and the NRC.

I would like to offer a few thoughts on the national security imperatives of what I call the U.S. nuclear enterprise. By nuclear enterprise, I simply refer to three significant programs:

First, the nation=s naval -- excuse me, nation=s nuclear weapons program, the Manhattan Project;

Second, the Navy=s nuclear propulsion program under Naval Reactors, and;

Third, the nation=s commercial nuclear industry.

Let me share my own experience in all three legs of the enterprise spanning four decades.

After graduating from the Naval Academy, I entered Admiral Rickover=s Nuclear Navy. I embarked upon a naval career that spanned 26 years, with 16 years of sea duty on six submarines. I carried both strategic and tactical nuclear weapons on three of these submarines. I was also privileged to command a Los Angeles class attack submarine, the USS Norfolk, for three years, during which time we drove that submarine 100,000 miles. That submarine and its reactor plant were engineering marvels, and the crews professional and highly motivated.

After retiring from the Navy and working for the House Armed Services Committee, I was confirmed by the Senate to serve as Principal Deputy Administrator at NNSA, overseeing the 30,000-plus people in the nuclear weapons complex. Later in 2010, I was confirmed to serve as a commissioner of the NRC, where I served from 2010 to 2016.

My 40 years in submarines, nuclear weapons, and commercial reactors has ingrained in me the vital role of human capital in the nuclear enterprise.

Nuclear is different. This work is hard, it is challenging, it requires the best trained engineers and scientists. But without that nuclear-related work to actually perform, those unique human capabilities atrophy at an alarming speed. And as

that reactor technology work decreases in the United States, so does the ability and opportunity for the United States to influence nuclear safety and security worldwide.

Are there national security consequences to a declining commercial nuclear industry? Absolutely.

Let us first look domestically.

A prerequisite for national security is energy security. Nuclear energy provides carbon-free, reliable baseload generation. It would be unwise for our Federal Government to sit by and watch the current industry decline continue, for at some point that decline becomes irreversible. It is naive to think we could revive the nuclear industry at some future point if it lies dormant for even just a generation.

Economically, the nuclear industry provides well-paying jobs supporting local communities across the country.

Let=s look at human capital for a brief moment. Many of the current nuclear plant operators at commercial plants started out in the Nuclear Navy. Will the prospects of reduced opportunity for employment in the commercial industry have a negative impact no the Nuclear Navy=s ability to recruit? I do not have any data to share, but I think the answer may be yes.

What about the impact of a declining industry on undergraduate and graduate programs in nuclear engineering?

What about the ongoing partnerships between community colleges and the nuclear plants that hire their graduates with

associates degrees?

I now turn to the impacts in the international arena. The ability of the U.S. to lead in nuclear safety, security, and non-proliferation efforts is significantly lessened as commercial activity erodes. To engage internationally, the United States must participate. I saw this firsthand as a commissioner in the aftermath of the 2011 reactor accident at Fukushima in Japan. The U.S. was a key leader worldwide in post-accident nuclear safety regulation.

I also saw this when speaking on best practices for both physical and cybersecurity for the IAEA in Vienna in 2015. Many countries look to the U.S. for regulatory lessons learned -- whether safety or security -- because of the reputation and size of our program.

When I was sworn in as a commissioner at the NRC in 2010, the New Reactor staff was reviewing license applications for 26 reactors. Today, that NRC staff is reviewing just two designs. While construction of the two AP 1000 units is in progress at the Vogtle site, no others are being built in the U.S. today.

As our nuclear industry shrinks, our nuclear voice is not as loud as it once was internationally.

Who fills that void? Russia currently dominates the export market for nuclear fuel and reactor technology. China is embarked on an aggressive domestic nuclear construction program and is poised to move out internationally.

It would be a natural development for Russia and China to control the nuclear export market and to aspire to key leadership roles at the IAEA and other international nuclear forums.

Finally, the traditional U.S. leadership role in nuclear non-proliferation is clearly threatened by this alarming trend.

In closing, it is a fact that our nuclear industry is in decline. There are clear, significant national security consequences at stake. This matter is urgent. I applaud the committee for bringing attention to this vitally important topic.

I look forward to your questions.

[The statement of Mr. Ostendorff follows:]

**********INSERT 7**********

Mr. Olson. Thank you, Mr. Ostendorff. And thank you so much for your service in our Navy. And people in the audience should know he was a driver. They are boats, not ships. I flew a plane that hunted them, a P-3 Orion. We could find those Soviets, but could never find them unless they wanted to let us find them. So thank you for that as well.

The next panelist is Dr. Peters from the Idaho National Laboratory. Dr. Peters, you have five minutes.

STATEMENT OF MARK PETERS

Mr. Peters. Thank you, Mr. Chairman. I want to thank you, Chairman Upton, and Ranking Member Rush, for the opportunity to be here with you today. And also thank all the members of the committee for joining us.

My name is Mark Peters, and I am the Director of Idaho National Laboratory. INL is the nation=s lead nuclear energy research and development laboratory, the place where 52 original nuclear reactors were designed, constructed, and operated.

It is our mission to provide the research, development, and demonstration foundation to extend the lives of the current operating fleet, develop the next generation of nuclear reactors, and provide integrated nuclear fuel cycle solutions.

As we have already heard, nuclear energy is a vital component of America=s energy system. And, in particular, advanced nuclear energy technologies provide an opportunity for the U.S. to meet future electricity demands while benefitting our economy, our environment, and our national security.

The United States remains in a position of strength. However, the future is not guaranteed. We are at a critical junction, a turning point as I like to say. Decisions made today will determine if the U.S. continues to lead the world in civil nuclear energy, innovation, and production.

I remain optimistic about the future of nuclear energy

because of the science and innovation coming out of our national laboratories, universities, and the private sector. We have the finest research, development, and demonstration facilities, the most developed capabilities, and the best minds.

I am also optimistic because of our history. America has always risen to the challenge. Before us is a grand opportunity to maintain and enhance our leadership going forward, while ensuring U.S. non-proliferation and safety approaches continue to be the world=s standards.

When the U.S. domestic nuclear energy industry languishes, our international leadership role suffers. Russia and China are aggressively expanding their nuclear capabilities. These nations, with their state-sponsored nuclear industries, enjoy tremendous advantages over the private sector in the U.S., and understand the decades-long influence that results from building a nuclear power plant in another country.

We also should not forget the benefits that U.S. nuclear energy brings to economic development. A healthy domestic industry allows for a robust export market and international influence. So national security and economic opportunity are powerful motivators to maintain and eventually build upon our advantages. So, how do we accomplish this?

First, by making sure we sustain our current nuclear reactor fleet. INL is working with utilities to modernize control rooms and work to provide the basis to extend the life of power plants

beyond 60 years. We have transitioned the Light-Water Reactor Sustainability Program from one concerned primarily with licensing to include helping utilities reduce operating costs.

But if we are to maintain that advantage, we must set up private-public partnerships to develop and deploy the next generation of nuclear reactors.

Our national labs are ideal places to do the research and development and then actually partner with industry to demonstrate these new technologies. Our current example is the emergence of light-water small modular reactors, as we have already heard multiple times this morning. It is great news for the American nuclear energy industry, and the nation as a whole, that the NuScale small modular reactor continues to work its way through the NRC process.

We have been involved at INL with NuScale from the beginning, providing technical support and guidance. And as you heard this morning, NuScale=s first SMR is planned for the INL Site, in partnership with Utah Associated Municipal Power Systems= utility consortium in the West. We will also be working with them on the Joint Use Modular Plant program that would allow the laboratory to actually use the first few modules in the 2026 time frame to actually develop and demonstrate advanced energy system processes, in collaboration with NuScale and UAMPS.

As you have already heard, SMRs are a game changer. They are smaller, safer, cheaper to build, easier to license, and a

window into a lucrative and an influential export market to go forward.

We are also working on advanced reactor designs, including coolants beyond light water reactor, cooled reactors. And as mentioned this morning, this will allow us to not only produce electricity, but also penetrate other markets with nuclear processes, for example, the manufacturing and transportation sector.

We are also excited to be working with the private sector to develop and demonstrate small, very small reactors, microreactor technologies. I think they have the possibilities of powering remote communities and military bases around the world.

Key to all this is maintaining the research infrastructure of places like Idaho National Laboratory, Argonne National Laboratory, and Oak Ridge National Laboratory going forward, like the Advanced Test Reactor, like the Transient Test Reactor, and like the Materials and Fuels Complex at INL.

We are also embarking on a development, design and deployment of a Versatile Fast Neutron Source that we would like to have in place within a decade that would further our U.S. leadership and provide that important infrastructure.

So, let us remain the world leader and a tone setter by developing a sound civil nuclear energy policy. I put to you that our national labs and universities give us a tremendous

technical advantage over our competitors across the globe. Let us approach the great opportunity with urgency, and a collective desire to achieve results and excitement to attract the net generation of nuclear scientists and engineers to our field. For the good of our economy, our environment, and our national security, let us embrace this challenge.

I am happy to answer questions.

[The statement of Mr. Peters follows:]

**********INSERT 8**********

Mr. Olson. Thank you, Dr. Peters.

Our next speaker is Ms. Maria Korsnick. And she is the President and CEO of the Nuclear Energy Institute. Ma=am, you have five minutes for your opening statement.

STATEMENT OF MARIA KORSNICK

Ms. Korsnick. I appreciate the opportunity to testify before you to highlight the state of America=s nuclear industry today

Nuclear power runs 24 hours a day, 7 days a week; provides almost 20 percent of America=s electricity. These plants are hardened facilities that are protected from physical and cyber threats, helping to ensure the resiliency of our electricity system in the face of potential disruptions.

The 99 reactors that we have in our nuclear fleet today represent 60 percent of the clean electricity in our country. Our nation=s nuclear industry, however, is at a crossroads, and we urgently need tangible signals from Congress that it values nuclear power. And this is not a partisan issue. I see members on both sides of the dias who either have lost nuclear plants in their states and local communities, or may soon experience this unfortunate event.

And you are not alone. America is in danger of losing dozens of her nuclear reactors in the next ten years. To put this in perspective, units that have recently closed, and those who have announced specific plans to close would produce 90 million megawatt hours of clean energy. That is enough electricity to power 8.4 million homes each year. And this is a conservative estimate, as there are additional plants who have not provided

a firm date but are clearly at risk, like the Ohio plants.

But it doesn=t have to be this way. Nuclear power=s contributions to this country deserve to be recognized. And this committee has the power to make that reality. A single nuclear plant creates hundreds of jobs and millions of dollars in revenue for rural towns and cities. And it produced unmatched amounts of carbon-free clean air electricity. And, as recently illustrated, it has the ability to withstand extreme weather events and continue to produce low-cost electricity, a major factor in ensuring the resiliency of our grid.

And for these reasons and more, we need to value nuclear power and work together to find a way to keep these essential plants online.

There is really four areas that need attention:

First is fair compensation;

Second is the fuel cycle. And that means the front end, the mining and enrichment piece; and the back end, a workable used fuel program;

Third is reforming the NRC. That involves both the fee structure and streamlining licensing of new technologies;

And fourth is exporting our technology. We need to level the playing field for our nuclear firms to compete against foreign governments.

My written testimony includes a number of legislative actions that would advance the prospects for nuclear energy to

meet our nation=s needs. I commend Chairman Upton for hosting a series of hearings on the electricity markets. And I cannot stress enough the importance of ensuring appropriate market compensation for the attributes of nuclear power. Market reforms are essential to the viability of the U.S. fleet. Simply put, we need your help to ensure that FERC and its associated RTOs and ISOs fully value the benefits provided by our plants.

I would also encourage the committee to consider innovative approaches, such as making it easier for federal agencies to enter into power purchase agreements with new and existing reactors.

I thank this committee for taking action on used fuel legislation. And I do hope we can work to ensure House passage of that legislation in the near future, and another bipartisan piece of legislation led by Congressmen Kinzinger and Doyle to address the much-needed NRC fee reform. We do appreciate these efforts, and hope we can get them to the President=s desk this year.

There is exciting innovation in the nuclear industry. It is happening across the company from reactor startups to the cutting edge research being conducted at our national labs, as you have heard. And this gives me hope. But if America, the country with the most reactors in the world, sits back and lets our fleet atrophy, that important innovation will die off as well. And we cannot let that happen.

Right now, of the 58 reactors under construction worldwide,

only two are being built here in the United States. And even those projects are in jeopardy pending congressional action on the Nuclear Production Tax Credit. Comparatively, Russia is building seven reactors, and China 19. We are in imminent danger of ceding our global leadership in technology, that we invented, to the Russians and the Chinese.

Failure to lead the next wave of global nuclear construction means a significantly diminished ability to promote U.S. safety standards, non-proliferation behaviors, and security norms around the world. Simply put, U.S. influence grows when we have a strong civil nuclear industry.

Nuclear power has always answered the call of this nation. It has powered our homes, our businesses, and our navy. It is allowing for space exploration and visits to Mars. It has helped fund schools and essential services in local communities across this country. Today the nuclear industry is here to ask America=s leaders to answer our call. Please work with us to make sure this American technology does not become a ghost of our past. Your help and your active support is urgently needed.

Thank you. And I look forward to answering your questions.

[The statement of Ms. Korsnick follows:]

**********INSERT 9**********

Mr. Olson. Thank you, Ms. Korsnick.

Mr. Trimble is recognized for five minutes as well. He is the Natural Resources and Environment Director at the Government Accountability Office. Five minutes, sir. Thank you.

STATEMENT OF DAVID TRIMBLE

Mr. Trimble. Thank you. Chairman Olson, Ranking Member Rush, and members of the subcommittee, the critical missions of the Department of Energy depend on the extraordinary capabilities found at the department and its network of laboratories and production facilities across the country. These capabilities depend on the large and unique capital assets found at these facilities, but also the expertise of the workforce that is a product of years of on-the-job training and experience that exists nowhere else in the world.

These capabilities serve all of DOE missions, including weapons, cleanup, non-proliferation, energy, and science. To successfully execute these missions, DOE must maintain, rebuild, and renew both its physical and human capital. DOE=s efforts, however, are hindered by longstanding management challenges that have been well documented in reports by Mies -- Augustine, Cranel, the Academies, and GAO.

The growing fiscal and budgetary pressures facing the government mean that DOE can no longer afford to poorly manage these billion dollar programs.

My testimony today will highlight some of the challenges facing DOE, including the affordability of NNSA=s nuclear modernization programs, the growing costs of DOE=s environmental liabilities, management challenges in the non-proliferation

program, and DOE=s efforts to improve its management of programs, projects, and contracts.

Regarding weapons, NNSA faces challenges with the affordability of its nuclear modernization programs. Our review of the fiscal year 2017 modernization plan found misalignment between NNSA=s plan and projected budgetary resources, which could make it difficult for NNSA to afford its planned portfolio of modernization programs. We found that NNSA=s estimates of program costs exceeded the projected budgetary resources included in the President=s planned near and long-term modernization budgets.

Regarding environmental cleanup, DOE=s growing environmental liabilities demonstrate the need for DOE to improve its oversight and management of its cleanup mission. In 2017, we added the Federal Government=s environmental liabilities to our high risk list. DOE is responsible for about 370 of the $450 billion total. And DOE=s total cleanup liability has been growing.

Over a recent 6-year period, DNN spent $35 billion on cleanup, while its liabilities grew by $90 billion. I should also note that these liability estimates do not include all of DOE=s future cleanup responsibilities.

Our recent works have identified opportunities where DOE may be able to save tens of billions of dollars by taking risk-informed approach to treating a portion of this Low Activity

Waste at its Hanford site.

Regarding non-proliferation, DNN has not consistently used program management leading practices. We found that DNN=s policies do not require programs that establish life cycle estimates or manage their performance against schedule and across baselines. In addition, we found that DNN=s R&D results were not being tracked consistently to help evaluate the success of that program.

To successfully meet the challenges facing it, DO needs -- excuse me, DOE needs to improve its management of its programs, projects, and contracts, areas that have been on GAO=s high risk list for almost three decades. In recent years, DOE has taken some important steps, including requiring the development of cost estimates in accordance with best practices; creating new oversight structures; and ensuring that major projects, designs, and technologies are sufficiently matured before construction.

However, significant challenges remain:

First, DOE still lacks reliable, enterprise-wide cost information. Without this information, meaningful cost analyses across programs, contractors, and sites are not possible. Reliable detailed data are also needed for DOE to manage its risk of fraud.

Second, DOE has not always followed its own requirements. In 2015, we reported that DOE initiated a new project, Low

Activity Waste Pretreatment System, to accelerate waste treatment at Hanford. We found this project was selected without full consideration of alternatives, and DOE=s cost estimates were not reliable. Additionally, DOE has not consistently applied these recent reforms to its largest cleanup project at the Hanford site.

Third, regarding program management, we found in 2017 that NNSA had established program management requirements for commodities like uranium, plutonium, and tritium. However, these requirements are not being met due to staff shortages.

In closing, let me note that we have several ongoing engagements for this committee examining these management challenges. And we strongly support the oversight efforts of the committee.

Thank you. I would be happy to answer any questions.

[The statement of Mr. Trimble follows:]

**********INSERT 10**********

Mr. Olson. Thank you, Mr. Trimble.

Our final opening statements if from Dr. Ashley Finan from the Nuclear Innovation Alliance. She is the Policy Director there. Five minutes, ma=am, and welcome.

STATEMENT OF ASHLEY E. FINAN

Ms. Finan. Thank you, Chairman Olson, Ranking Member Rush, and distinguished members of this subcommittee. Thank you for holding this hearing and for giving me the opportunity to testify. I am honored to be here today.

I am Ashley Finan, Policy Director for the Nuclear Innovation Alliance. The NIA is a non-profit organization dedicated to supporting entrepreneurialism and accelerated innovation and commercialization of advanced nuclear energy.

The world will increase its energy demand by 40 percent or more by 2050, driven by an emerging middle class in the developing work, and the need to bring electricity to 1.2 billion people who lack it today. At the same time, it is well understood that clean energy is essential to human health, and many analyses point to the pressing need to transition to an emissions-free energy system.

Nuclear energy will play a vital role in a future energy supply that addresses these priorities. The question for us is: will the United States be a part of that?

In the U.S. and elsewhere, start-up companies are pioneering advanced nuclear designs that offer opportunities for increased safety and affordability, enhanced non-proliferation attributes, and a reduction in nuclear waste. These designs can revolutionize the nuclear industry and revitalize U.S. exports

with products that take advantage of the latest manufacturing and computing technology, that are competitive in markets across the globe, and that exceed the expectations of customers and the public.

But the transition from design to commercialization and deployment has been hampered by significant under investment in research, development, and demonstration, by a slow and under prepared licensing process, and by a long and lengthening export control process.

The government plays several roles in the commercialization and expert of a nuclear energy technology. It is an R&D collaborator, a demonstration partner, a regulator, and a promoter. In turn, as with any new technology, the nation profits from the economic impact of the product and the exports and jobs it creates.

Unique to nuclear energy, though, are several other benefits: including century-long strategic trade relationships with customer countries; reliable clean energy to fuel domestic and global prosperity, and stronger U.S. influence over global nuclear safety, security, and non-proliferation standards.

We have not seen a booming U.S. nuclear export business in decades. Not least among many causes is the lack of a compelling nuclear energy product from the private sector. The market demands plants that are more resilient and flexible, lower impact, and simpler and cheaper to build and to operate. As I touched

on earlier, companies are answering that call, and they are innovating. They are finding a U.S. government that is curious, and interested, but not wholly invested, and not always ready to innovate.

Meanwhile, Russia is building a fast test reactor to replace its retiring predecessor, as well as a lead fast reactor to join its two operating sodium reactors. China is simultaneously running several major R&D programs, and its commercial high temperature gas reactor will be connected to the grid this year. India=s prototype fast reactor will also enter operation this year.

I don=t want to be alarmist. This does not need to devolve into a geopolitical race. But it is a harsh reality of business that if we are last to market, we are likely to become irrelevant. And it is a harsh reality of global nuclear security that the countries supplying nuclear power have the strongest hand in influencing how nuclear programs are protected from misuse and how safely those programs are run.

Export application timelines through DOE=s Part 810 specific authorization process have slowed from 150 days on average to over 400 days between 2000 and 2014, with some decisions taking over 900 days. This authorization is often required very early in the marketing process to allow companies to share information with potential customers. Long processing times make it difficult for U.S. companies to compete.

The NIA has proposed actions to improve these timelines in its APart 810 Reform" report, including changes to DOE=s processing structure. We need to address this issue.

Similarly, NRC licensing of advanced reactor technology is fraught with major challenges, as described in detail in my written testimony. The NRC has begun addressing these challenges, but they have done so with extraordinarily limited resources. This work needs to be pursued with dedicated funding and with urgency.

To secure a leadership position in the global nuclear market, the U.S. needs to move its designs from development to demonstration and deployment. The NIA made recommendations in its ALeading on SMRs" report: Congress and the Administration should expand support for the development of first-of-a-kind demonstration projects, and it should explore opportunities for advanced nuclear reactors to provide reliable power to federal facilities.

The private sector cannot do this alone. And it is time for government to move from being interested to being invested. It is time for government to act with urgency and to support innovation earnestly. These efforts will help bring our homegrown advanced reactor technologies to market more quickly, so that these transformative technologies can leapfrog international competition.

Thank you for this opportunity to testify. I would be

pleased to respond to any questions you might have, today or in the future.

[The statement of Ms. Finan follows:]

**********INSERT 11**********

Mr. Olson. Thank you, Dr. Finan. Now is the fun time, members questions. And the chairman gives himself five minutes for a round of questions.

The first question is to you, Ms. Korsnick. You mention in your opening statement the work other companies are doing to deploy nuclear reactors. And I want to translate that to Texan. You said we are getting whipped, I think would be whipped by these guys overseas.

Part of their deployment overseas is by cost and government support, but they have regulatory hurdles as well that are part of their equation. My question is, can you talk about what they do that is different than what we do? Are they big differences? Are they safer, the pros, the cons? How can we catch up pretty quickly, because we are losing the race right now.

Ms. Korsnick. Yes. So, as we have talked here, the competition is significantly in Russia and China. And I would say they look at their nuclear fleet in a much more strategic way. They decide quite up front that if they are involved in your energy they have some amount of control of your future.

So, a Russia person knocking on your door would say, I am going to build you a reactor. I am going to operate your reactor. And I am going to take your used fuel.

It is not the same business proposition, quite frankly, that we can make.

On the positive side for us, we have very strong technology,

very good technology, and we still have countries that are very interested to do business with the United States. But we need to be more aggressive. We have got to level the playing field. We need to make it much more easy for our businesses to do business in the nuclear sector.

Mr. Olson. I have a question two. Much of the conversation on nuclear energy is focused on commercial reactors for power, generating electricity. However, those reactors are just one piece of the entire fuel cycle. You have processes like mining, conversion, enrichment. They are all critical to have a robust nuclear industry.

We also forget about the workers. Comments were mentioned during the first panel, the South Texas Power Plant right there in Bay City is having a crisis of workers because opened up in 1979, those workers have been there since then, they are now retiring. Luckily, they have approached Wharton County Junior College, they have a campus down there, to train the next succession of workers, because without them that place goes dark.

And so, what is the state of our industry across-the-board, our fuel cycle, what changes do we need dramatically now, and what to work on in the future to get this thing, this ship righted quickly?

Ms. Korsnick. So, if you look at the worker picture, I would say currently the picture is not too bad. The challenge that we have is if we don=t continue to invest in this industry --

and we heard from speakers earlier -- that people don=t continue to study nuclear engineering. They don=t continue to go into these programs.

But over the last several years the nuclear industry has paired with local community colleges, et cetera, and put programs in place to keep that pipeline of talent, if you will, strong. Those programs have paid off. And I would say currently the pipeline is healthy. But that is because the current state, if you will, there=s some view that there is jobs to be held.

As they watch these plants close that picture changes very quickly.

Mr. Olson. Next question is for you, Dr. Peters. I understand that DOE, as you mentioned, has entered into a site use permit for the INL and NuScale to construct the first SMR. Your testimony, though, is that INL has partnered with NuScale since the outset in their efforts to build this new design. Based on that experience, what policies should be considered in the future to make what you are doing go all across the country?

Mr. Peters. Thank you for your question, Mr. Chairman. So, so we have partnered with them from the beginning. And that started with actually a DOE grant, a few decades ago actually. So it has been a long run.

But the partnership that we have with them now, it is there is a permit that, an MOU effectively, that says, here, what it looks like to use our site. But there is also strong

collaborations with them vis-a-vis potential use of some of the modules for, for research use, and also power purchase agreements between them and the government. So I think those sorts of approaches can be used with other reactor vendors, so things like power purchase agreements, like using, using them for research.

And using the site. We have built 52 reactors on our site, so there is plenty of space. We can actually demonstrate more. So I think you have just got to take what we have already done and transfer that over to other reactor vendors.

I should also tell you -- I can=t get into specifics here, partly because of NDAs and whatnot -- but there are other companies that are calling us now and saying, hey, with this NuScale-UAMPS deal can we actually talk to you about how we might be able to do that on your site as well?

So there is a lot of promise there. I would emphasize that the innovation and the advanced reactor space in the U.S. could put us back, could put us back in the lead if we play it right.

Mr. Olson. And, sir, that is music to my ears.

My time has expired. The chair now calls upon the ranking member of the subcommittee, Mr. Rush, for five minutes.

Mr. Rush. Well, thank you, Mr. Chairman.

Ms. Korsnick, I have said it on several occasions that I believe that we must establish policies that place the light on our nuclear fleet, the sources of safe, reliable, low-carbon energy. However, I did not agree with the DOE NOFA because it

appeared to be non-hastening and with little transparency or dissertation for how that outcome was decided.

And second, during our Powering America series of hearings we heard that fuel diversity is an important -- is as important to reliability as any other characteristic.

So the question remains how do we get to the point where our nuclear fleet is thoroughly and reasonably united with some of these unique attributes, but we are not limited solely based on the 90-day storage rule?

So, the question is, do you support a strictly market rate approach wherein the ITOs implement price reform efforts to recognize the different contributions of nuclear resources? Or do you believe that there is a role for Congress in helping to enact policy objectives, such as moving toward a low carbon economy that will lessen the contributions made by the nation=s nuclear fleet?

And I also want to ask for a response from the other members of the panel.

Ms. Korsnick. Thank you. I would say ultimately we do favor a market solution. But I would say that that market solution is too slow in coming. And so, the challenge that we have is as the market is trying to sort this out we are going to see still yet several additional plants close.

And, you know, I would just step back and say at a high level, currently, you know, electricity as a commodity, every electron

is treated equally. Some of those electrons produce pollution to produce those; some of those electrons were produced in an intermittent fashion; some of those were produced from a baseload reliable resource; some produced carbon to make them; some produced emissions, some didn=t. And so, at the end of the day we need a process where the market really values how those electrons were produced and not just that electrons were thrown onto the grid.

And this is the process that the market needs to, you know, to step through. We do appreciate an all-of-the-above energy strategy. But, again, the challenge that we have is the market=s response has just been too slow in coming.

Mr. Rush. Any other? Yes, sir.

Mr. Ostendorff. Congressman Rush, thank you for your question. I completely agree with Ms. Korsnick here. And would suggest that if under your -- in your opening statement this morning you talked about all-of-the-above.

Mr. Rush. Right.

Mr. Ostendorff. And I, I am part of that strategy. From my own philosophy, you need to recognize what we do to imperil nuclear energy as a potential source in the future if we don=t support it right now.

Defendants say we need to not just be interested, we need to invest. I completely with what she just said here. This is not something that can wait ten years and decide the Federal

Government should invest; it needs to happen now. It is not going to get any better with time. And as more plants continue to close because of economic issues, I think we might face the reality of not having this open as a future option for us.

Mr. Rush. Ms. Finan.

Ms. Finan. I think that nuclear power is important because it can address a wide array of concerns, including but not limited to national security, energy security, air emissions, and reliability -- all of those simultaneously. So it is appropriate to value all of those attributes as we think about our energy sources.

And the NIA will be pleased to work with the committee to evaluate ways that Congress can help.

Mr. Rush. Mr. Chairman, I yield back my time.

Mr. Olson. The gentleman yields back. The chair now calls upon the gentleman from Illinois, Mr. Shimkus, for five minutes.

Mr. Shimkus. Thank you, Mr. Chairman. And it is good to follow my colleague from Illinois.

Also, I am going to follow up. I am changing my order of questions. I want to go to Ms. Korsnick on this whole debate of market-based solution too slow.

Republican conservatives we believe in markets. And we believe that -- but we also believe that if there is a risk profile or uncertainty, that is a cost that is passed on. So in my first panel round you heard me talk about the front end

of the fuel cycle. Of course now I guess the question is on the back end of the fuel cycle because of Federal Government inaction is there risk and additional cost incurred by the nuclear industry in holding, maintaining, storing, litigating the back end of the fuel cycle?

Ms. Korsnick. There is a cost. But I would say it is even steeper than, than what perhaps you are suggesting. And I would say one of the number one reasons that people question the viability of nuclear power is because we do not have a waste strategy.

And so it is not only a cost in operation, it is a reputational cost, quite frankly, to the industry at large that says we don=t understand. It must be really difficult to solve. It must be, in fact, technically impossible because, as the United States, we haven=t solved it in decades.

And to try to counter that with, well, no, it is not technically difficult; no, there is a very technically feasible solution; we have just chosen, in fact, not to adopt it; it has actually put an albatross around the neck of the nuclear industry to, quite frankly, go forward with viable public support.

Mr. Shimkus. Yes, and I, I am glad you finished that way because I would say we do have a strategy. We do have a law. We just have failed to implement it. It has really been a political failure, not a scientific failure.

Of course, Mr. Ostendorff and I have had this discussion

when he appeared before us with the NRC, and it took court cases to ring out of the hands of the NRC the safety and evaluation report that said long-term storage would be safe for a million years, which took a lot longer. I thought it was going to take a million years to get that report out.

But having said that, I want to go to Mr. Ostendorff. And I don=t want to read the whole, the national security strategy of the United States of America, issued a report in December, but the basic premise is the nation=s ability to produce needed parts, systems help, and secure supply chains, and skilled U.S. workforce. That is their concern based upon the national strategy.

In your previous life as a boat captain, is there a concern? Is that a valid concern if we lose this expertise?

Mr. Ostendorff. I would suggest -- I will answer this two ways, Mr. Shimkus. First, my experience on boats is a long time ago. But I can tell you at the end of the Cold War when I had taken command of a submarine in 1992, there were 100 attack submarines in the U.S. Navy. Today that number is 53. So the industry=s base of providing products for naval reactors as an organization for nuclear powered submarines and aircraft carriers -- and the cruisers have gone away, the cruisers have all been decommissioned -- that product base where the supply is naval reactors has shrunk.

Naval reactors has indicated that they are doing okay right

now, but there is not a lot of other options for them to go to. And whereas you used to have companies that did work for naval reactors and for the commercial nuclear industry, now it is just sole source naval reactors. And so that has your overhead costs increased because they have a smaller customer base. Those kinds of issues are real.

Mr. Shimkus. So in my couple seconds left, even former Energy Secretary Menezes mentioned that we have, we are the gold standard of engineering, development, construction. As we go through this high risk profile of uncertainty do -- and this is really you all kind of mentioned it in your opening statements -- do we really believe that Russia and China, with their deployment and their construction, will be safer and trained better than if we were competitive in the world market?

Ms. Korsnick, what do you think on, on safety, security, international aspects in this Russia, China, world leadership debate?

Ms. Korsnick. I think if your question is is the United States still the best operators of nuclear plants today, it is unquestionable that we are. You can see with our strong operational record and our 90 percent capacity factor. So I would say we are by far the best from an operational excellence perspective.

But at the end of the day, if the Chinese and the Russians are building the reactor, then that is the technology that is

going to be out there, and that is the technology that people are going to want to understand how to operate and what to learn from. And that is why it, strategically, it is important for us to get our designs out there.

Mr. Shimkus. Thank you. Thank you, Mr. Chairman.

Mr. Olson. The gentleman yields back.

The chair now calls upon a member who during the first panel is a big fan of Lynn Swann but not Harold Carmichael, the man from western Pennsylvania, Mr. Doyle, for five minutes.

Mr. Doyle. Thank you, Mr. Chairman.

Ms. Korsnick, I wanted to ask you a question about your testimony regarding NRC fee structures. Can you explain how the current fee structure penalizes reactor licensees that continue to operate if another licensee decides to discontinue operation?

Ms. Korsnick. Well, right now the way that the structure has, across the licensees, 90 percent of the budget for the NRC needs to be collected from the licensees. And so as plants shut down there is just fewer to spread those costs across to achieve that 90 percent.

Mr. Doyle. Yes. And I, I think H.R. 1320, the bill that Representative Kinzinger and I have introduced, and which you highlighted in your testimony, would address this issue. And I appreciate you mentioning it in your testimony.

Dr. Finan, in your written testimony you express similar concerns over the current fee structure of the NRC. In your

testimony you urge, in preparation for the licensing of advanced reactors, consistent public funding for the agency. First, could you speak to what fee reform would be beneficial to the nuclear industry going forward, and what level of funding you would recommend?

Ms. Finan. Well, the NIA supports reforms that address the NIA=s fee structure. And in particular, H.R. 1320 would enable the NRC to use dedicated funds to prepare for advanced reactor reviews. That is an important part of that bill.

It is also important that that authorization is paired with adequate appropriations to enable progress on that front. The NRC has identified figures of around $10 million per year as being adequate to support their ongoing effort.

I think that, additionally, the NRC=s current schedule is slower than the innovators would like to see. So if there is a way to bump that up a little bit and allow the NRC to accelerate and move faster, that would be well worth it.

Mr. Doyle. Great.

Can you tell me what other regulatory reforms you think we should consider to help spur deployment of advanced reactors?

Ms. Finan. Well, I think that, you know, one important area is in the Part 810 reforms. We have issued a report recently recommending several reforms to Part 810. It is the export control regulations have evolved over the years. Initially there were 15 countries that required specific authorization. Over

time, and by 2015 that had grown tenfold to 149. And in particular, in 2015 the number doubled from 75 to 149.

That, paired with the very long review times are really putting our companies at a disadvantage overseas. So we need to address that. And we have made several recommendations regarding the DOE=s processing structure and some other opportunities to move that faster.

Mr. Doyle. Thank you.

Ms. Korsnick, in your testimony you said the nuclear industry is at a crossroads. I want you to just elaborate on the current outlook for the nuclear industry.

Ms. Korsnick. Well, I would say from a current outlook perspective, you know, five plants have shut down; eight plants have announced that they are going to shut down within the next several years. And those are ones that have just, as I said, given a specific date or a specific year that they are going to shut down.

And there are a handful of others that are clearly challenged. I mentioned the power plants in Ohio, for example. Those were not included in the eight that we mentioned, but clearly are challenged to continue to operate.

And so, if you look at that, you know, holistically, as I mentioned, it is more than 90 million megawatts of clean air energy that would be produced on an annual basis. That is a lot. And I know that there has been great technology in solar, and wind,

and others that have been brought to bear. But we are digging a very deep hole for clean air that will be very difficult to fill. I would say it is not possible for the other clean air technologies to fill that.

So we are simply, if you will, working backwards.

Mr. Doyle. Why don=t you also just speak a little bit about the economic benefit of the industry to our country? I think people --

Ms. Korsnick. Well, yeah, I mean it is powerful. I mean, somebody mentioned that we employ, you know, 500,000 workers both directly and indirectly. I think from a tax base perspective I think we contribute, you know, $16 billion, something of that magnitude, might be $12 billion. So, I mean, it is a very strong contributor, in fact, to our economy.

I was a site vice president at a power plant in New York, and I saw firsthand the impact of these plants. You know, when I had to talk to the local mayor and the school superintendent about the possibility of the plant that I ran potentially shutting down, you know, they said, but, Maria, you are the school system. Right? We are so dependent on the tax base that you are to this local community that, you know, quite frankly they, they didn=t really have a way to go forward without.

And that is very typical of where these plants operate in the rural communities and towns that they are a part of. You know, they are a part of the hospital system, the police system,

the school system. And, you know, they have been operating reliably for so many years.

And I will remind you that when these plants were originally commissioned, you know, they were really commissioned for 40 years of operation. That 40 years has turned into 60 years. You just have a plant go forward this year that is taking that 60 years and asking for 80 years of operation. So these are gems. These are highly reliable, clean air technology. We are talking things that operate 80 years. And there is nothing magic about 80; they can probably go for 100 years.

So this kind of technology, this kind of investment, this is infrastructure in the United States, and we should look at it in that capacity.

Mr. Doyle. Right. I see, Mr. Chairman. Thank you for your courtesy of letting -- I just want to say as I close, as Commissioner Ostendorff said, that it is unwise for us to sit by and watch this industry decline because at some point decline becomes irreversible. I want you to know I couldn=t agree with that statement any more. And I think we all need to take that very seriously.

Mr. Chairman, thank you so much for your courtesy.

Mr. Olson. Thank you. The gentleman=s time has expired.

To follow up on the gentleman=s comments, Ms. Korsnick, you should know about South Texas Power Plant. When Hurricane Harvey hit the big power plant in my district had four coal generators

and four natural gas. The coal got wet. All that coal is down. That nuclear plant kept running in the worst part of the hurricane. So that is an important part. It is reliable, it is there, it is clean, we have to make more of it.

The chair calls upon Mr. Flores from Texas for five minutes.

Mr. Flores. Thank you, Mr. Chairman. I appreciate the panel sharing their enlightened responses with us today.

Ms. Korsnick, I appreciate your answers to Mr. Doyle=s questions about the impact that these plants have on the local communities. I was privileged in my first term to represent the Comanche Peak complex up in Somerwell County, Texas. And without those plants I mean there is no school system, no police. You are exactly right. There is no community. So I appreciate your comments on that.

I am privileged to represent two tier one research and education universities: Texas A&M, which has a highly acclaimed nuclear program; and also the University of Texas which was the home to former NRC Commissioner Dale Klein.

Mr. Ostendorff, as a professor of national security at the Naval Academy and as a former officer in the Nuclear Navy, are you concerned about whether young men and women who are looking at their future careers, including those at the Naval Academy, are you concerned about what they are going to think about the nuclear industry moving forward in light of its state today?

Mr. Ostendorff. Yes, sir, I am. There is no, there is no

question about it.

I don=t have any statistics to share with you, but I see midshipmen all the time. I have been an adviser to the Naval Academy=s nuclear engineering program. And I have spoken at the University of Texas, their engineering program, about nuclear issues when I was a commissioner. And I see people saying, young people today in their twenties and early -- I would say in their twenties, they are really looking ahead. What are the options out there for me 10 years, 20 years from now? And they are taking a very calculated look at what opportunities exist or do not exist.

And as Maria has said, when you have five plants that are shut down, eight more have announced to shut down, the signals are there. There is no ambiguity about the current status of the nuclear industry. And I have very strong feelings that that is a negative signal for people to want to pursue that.

Mr. Flores. Okay. Just in a few seconds each, does anybody else on the panel have any comments on that issue?

Mr. Peters. Yes, I would, I would comment on that. Just reemphasize that, well, just briefly, I was at Texas A&M in November for an interaction between the laboratory and Texas A&M. And I was enthused by, I was in a room of about 100 students, and I got inundated with questions afterwards, including resumes and whatnot. So that is a good thing.

But I think that is fleeting. If we don=t -- you know, that will go away. Five years from now that will not be the same

room if we don=t do something now.

Mr. Flores. Right. And I appreciate Ms. Korsnick=s comments and also Dr. Finan=s comments about we, as policy makers, have to invest in helping to have a healthy nuclear industry moving forward.

Would anybody on the panel like to comment about the role of university nuclear programs and how these programs interact with ongoing research, and industry, and issues as we move into advanced nuclear? Anybody have any comments?

Mr. Peters. Well, they are vital. We have close partnerships, the laboratories all work closely with the nuclear universities, the universities with nuclear programs across the nation. They are vitally important.

And maintaining their infrastructure is really important as well. So the research reactor, like at Texas A&M for example, and other universities, because that teaches the kids how, not only how to operate reactors but also the kind of research that you can do in those reactors. So that is all very, very important.

But also, more collaborative programs, having DOE and the NRC continue their graduate fellowship, fellowship programs. And that is always something we collectively support up here, I know. But also more collaborations where we bring more kids to the lab for internships and whatnot. And we are working that very actively.

But they are vital. That is the pipeline. If we don=t keep

those alive, we are in trouble.

Mr. Flores. Dr. Finan, you look like you would like to add something.

Ms. Finan. I would just add that the university programs and the students play a vital role in inspiring the industry and the labs to think differently and to do things in a more innovative way. So they are really crucial, not just as a pipeline but as driving the industry to think big.

Mr. Flores. Okay, thank you.

Anybody else on this?

[No response.]

Mr. Flores. Okay. Thank you for your participation today. I yield back.

Mr. Olson. The gentleman yields back. The chair now calls upon the pride of Saratoga Springs, New York, Mr. Tonko, for five minutes.

Mr. Tonko. There you have it. Welcome, everybody.

I always am quoted as saying I want the United States to be the leader of the global clean energy economy. And that certainly includes advanced nuclear.

It seems clear from today=s testimony that other countries around the world are overtaking us in commercial nuclear energy. Other nations see the need for clean energy as well as the export market opportunities. So there is a big question of what will be the consequences of nations like Russia or China dominating

the global market.

And I know that, Dr. Finan, you had provided some examples of that in earlier questioning.

But, Dr. Peters, I believe our nation has a tremendous advantage over our global competitors due to having the best facilities and universities in the world. You just made mention of that partnership of the labs. Can you drill down a little deeper for us about the importance of funding for our national labs and how they interact with the Department of Energy in terms of support for R&D investments, and what that means to our advanced nuclear research agenda?

Mr. Peters. Sure. So the labs as a whole, across all of the DOE research portfolio, have -- there is a partnership associated with it. There is the oversight component. But I feel very good about the partnership and helping set the research agendas from the Office of Science, which you are familiar with in Brookhaven, over to the applied programs like nuclear.

As you heard Mr. McGinnis say earlier, a small number of the labs, including INL, work very closely with them to help set the research agendas. So I feel good about the partnership.

I can=t say, I can=t agree more on the need for stable, stable research funding, and not having this up and down, up and down. We are maintaining large facilities. We are retaining world class workforce.

I would also say it is, it is a question of maintaining

international leadership because other countries are trying to emulate the national lab system.

Mr. Tonko. Yes.

Mr. Peters. That is going on across the world.

Mr. Tonko. It is interesting that you point out the certainty level.

Mr. Peters. Yes.

Mr. Tonko. And where we have been losing some people in an international competition, where it may not even be about the applied salary as opposed to that the certainty is there.

Mr. Peters. Right.

Mr. Tonko. There is this long-term commitment. And I am hearing that now in your statement.

Mr. Peters. Yeah. The lab records as a whole have concerns, lack of stability. We have exciting work to do. That is never a question. It is the lack of certainty from year to year that does tend -- and it is either folks who perhaps foreign nationals who work at the lab, which are an important part of the lab, who go back to their home country. Or, for that matter, U.S. people who go to a university to work, or over to industry.

And I always say I am not afraid to lose good people if it is for the right reason. But that is not the right reason.

Mr. Tonko. Yes, absolutely.

And, Mr. Ostendorff, you made some very strong comments about

human infrastructure with which I completely agree. A great point that you made. And this sector needs our nation=s best engineers and scientists. And I have been able to meet with amazing young people pursuing these careers in my district. Sailors training at Kesselring in Saratoga County; nuclear engineers over at RPI, some of whom have gone on to work at Knolls Atomic Power Lab in Niskayuna.

And the failure to develop the next generation of nuclear technology, coupled with the decommissioning of our existing nuclear fleet, would certainly hurt our ability to maintain an industrial base, supply chain, and the necessary human infrastructure in order to have the United States be a global leader.

If those capabilities go away, can you explain the difficulty to rebuild that infrastructure, the human infrastructure?

Mr. Ostendorff. Just a real quick comment. I lived in Saratoga Springs six months in 1977 going to Ballston Spa prototype, S3G core-3. So I --

Mr. Tonko. Good choice.

Mr. Ostendorff. -- know that area well.

But and the people there were military and civilian. General Electric had the contract. And so we were working with a mixed workforce where people took great pride in this. And others, you know, Dr. Finan has very capably mentioned the security aspect, knowing what the future presents as far as

opportunities, that is very essential. And people will beat their feet to go elsewhere if they don=t have the opportunities.

And very quickly, we have seen, Ms. Korsnick is more of an expert on this than I am, but I saw as NRC commissioner how hard it was for us to start the construction of the AP1000 reactors in the United States. Just look at Lake Charles, Louisiana -- I grew up in Louisiana, so I can say this -- they struggled mightily to develop the modular construction for these containment pieces that, because we had not done that for many years, didn=t have welding qualification standards in place, did not have the NQA-1 nuclear stamp processes. Those things are much better today than they were, but back in 2012 when construction started it was not going that well.

And so I think we should not underestimate how hard it is to resume something after a long hiatus.

Mr. Tonko. Thank you. That is a very helpful insight.

So, with that, Mr. Chair, I yield back.

Mr. Olson. He yields back.

The chair now calls upon a member who is from one of six states that was a part of the Republic of Texas, Mr. Mullin from Oklahoma.

Mr. Mullin. Oh, my goodness. If you didn=t have such a good baseball season I would make some wisecrack about our great football season.

Hey, Mr. Ossendorff -- am I saying that right?

Mr. Ostendorff. Ostendorff.

Mr. Mullin. Ostendorff. All right. I apologize about that.

Thank you, first of all, the entire panel for being here. It is very insightful for all of us and for Congress as a whole.

But, you know, for years the U.S. led in nuclear power. And as we have said multiple times already here, you know, China has quickly taking that role. Strategically speaking what does that, what does that mean for the U.S.? What does that mean for the future of our nuclear power and the stability, even on national security issues, for us moving forward?

Mr. Ostendorff. So let me give you these two examples. I will use the one I was personally involved in was the aftermath of the March 2011 Fukushima event.

Mr. Mullin. Right.

Mr. Ostendorff. The United States= industry, NEI, U.S. industry, NRC, Department of Energy, State Department played a major role in helping Japan look at how to move forward. We would not have had that opportunity if we were not operating the largest reactor fleet at the time, period. There is no question about that. We were a key player, Japan looked to us. And I think we added a lot of value to nuclear safety worldwide.

Second area let=s talk about, and others have mentioned, China and Russia developing new reactor technology. And I used to do a lot with Russia when I was an official of NNSA ten years

ago. Russia has significant technical capabilities on the engineering side; a long history of nuclear engineering on the commercial side; and then their submarine force. Our ability as a country to influence future nuclear standards going forward is almost nil if we are not doing something ourselves in the United States.

Mr. Mullin. Good point.

Mr. Ostendorff. And if we are not a player, we don=t get a voice. It is as simple as that.

Mr. Mullin. So how would you think that plays into our national security risks?

Mr. Ostendorff. So, one example I would just offer: our ability as a country to have an understanding of what other countries= abilities are in uranium enrichment, the ability to produce weapons grade material for a bomb. Our understanding of other countries= ability is informed by people like Dr. Peters and INL staff, because they are doing research, they have the technology every day.

So, not to get into classified issues, which is not the purpose of us being here, but there is a nexus with understanding other countries= capabilities by being involved in nuclear technology, research, and development.

Mr. Mullin. So is it safe to say because of our lack of really moving forward with our nuclear technology and the nuclear power that we have, and it seems that we are drawing backwards,

is there going to be a drain on the expertise of personnel that is going to be available to be able to understand where to move to, understand what our threats are and what the future holds for it?

Mr. Ostendorff. I think we will always have dedicated Americans ready to work and support Department of Defense, intelligence community, and so forth. However, in many cases they leverage the research done, Argonne National Laboratory, Los Alamos, Lawrence Livermore, and so forth. They also leverage the lessons learned from the NuScale, looking at their SMR designs.

And so as we decrease that reactor technology R&D in this country there will be less of an opportunity for us to have an understanding of what is in the art of the possible elsewhere.

Mr. Mullin. So just kind of an overview, could you tell us where you feel like the industry is headed, and in what areas we could help in?

Mr. Ostendorff. Well, I think, as others have greater expertise than I, I will just give you my layman=s version. Let me go back to Dr. Finan=s comment. I think at this stage the Federal Government needs to invest. I think Department of Energy has done a very credible job of trying to support --

Mr. Mullin. Invest in specific areas?

Mr. Ostendorff. Oh, I am going to talk about small modular reactors just for a moment.

Mr. Mullin. Okay.

Mr. Ostendorff. I think the small modular reactor work that Department of Energy, Office of Energy, Mr. McMinnis -- McGinnis= group has been very good. I am not sure that is going to be sufficient to ensure that SMRs are going to be economically marketable.

A former head of Naval Reactors talked about the building of the 18-unit Ohio Class submarines back in the 1970s and early 1980s. That former four-star admiral in a discussion four years ago said that Naval Reactors learned about a 78 percent efficiency curve going from the first Trident submarine build to the 18th. We have to have X number of units to spread the risk out. It is just not going to be sufficient for the United States to build just one or two SMRs. We need to be able to spread that risk out over many more than that.

I think perhaps the Federal Government has a role in investing in that project.

Mr. Mullin. Yes. My time is out. Panel, thank you so much. Mr. Chairman, thank you so much for, for the time you allowed me, and I yield back.

Mr. Olson. The gentleman=s time has expired.

The chair now calls upon the gentleman from the Wolverine State, Mr. Walberg, for five minutes.

Mr. Walberg. Thank you, Mr. Chairman, and thanks to the panel for being here. Having a nuclear power plant in my

district, this is an important issue to understand.

Ms. Korsnick, I understand that in addition to paying fees to the Nuclear Regulatory Commission, commercial nuclear power plants also fund FEMA=s REP program as well. Industry fees I am told total over 30 million annually to support FEMA=s efforts to coordinate state, local, and tribal governments to plan, to train, and conduct preparedness exercises in the event of a radiological emergency, which we hope never takes place.

This program supports some important activities. However, given the ongoing cost pressures on our fleet of nuclear reactors I want to be assured that these fees are only directed to activities that support the program=s mission.

And so, Mr. Korsnick, are you aware of this program? And secondarily, what sort of oversight is necessary to make sure the program is run efficiently?

Ms. Korsnick. Yes, thank you. I am aware of the program. The program standards for Radiological Emergency Preparedness Program. And we actually are very concerned, relative to the transparency, of how these funds are being spent. I do think that it is important. And we ask, in fact, this committee as oversight to help us gain that transparency.

Because right now, although we put in a sufficient amount of those funds -- and you mentioned, you know, $30 million -- it is very difficult to appreciate exactly how these funds are being spent. And, in fact, there has been allegations to

suggest that they are being spent on non-REP activities.

Mr. Walberg. Do you have any examples of that?

Ms. Korsnick. Well, I can just say that there has been allegations that were made. I don=t personally, I can=t personally substantiate the veracity of those allegations. But we do suggest that an audit of those funds would be appropriate.

Now, would this, this audit provide that transparency that you are seeking? And how? Is there a mechanism -- help me out with that -- is there a mechanism by which if you did have an audit that that information could be transparent to you and be useful?

Ms. Korsnick. Yeah. And I guess what I am suggesting is I do think that that would be an important thing to take on. Perhaps that is something that this committee, with your jurisdiction, could help encourage that such an audit would be performed.

And then, of course, depending on the results of that audit, obviously, you know, we could be the best next steps going forward. Would there be some additional transparency requirements, different reports perhaps that would need to be, that would need to be made?

But I think a good first step is to get an audit.

Mr. Walberg. Okay. Any further, anything from the rest of the panel?

[No response.]

Mr. Walberg. Thank you, Mr. Chairman. I yield back.

Mr. Olson. The gentleman yields back.

The chair now calls upon the gentleman from the Palmetto State, Mr. Duncan, for five minutes.

Mr. Duncan. Well, Mr. Chairman, I am surprised that you know that we are the Palmetto State, but we are glad we are because 57.6 percent of the state=s electricity comes from nuclear power. So, very apropos to the hearing today.

Captain Ostendorff, you have, you mentioned in your opening statement that a prerequisite for national security is energy national security. And I couldn=t agree with you more.

First off, thank you for your service to our country in the United States Navy and all that you continue to do training the young men and women of the future in the Navy today.

You also mentioned it is imperative the U.S. remain a global leader in non-proliferation efforts. And this depends upon as domestic, commercial activity increases. The President mentioned in his State of the Union a push for a robust 21st Century nuclear program for our nuclear arsenal, deterrence, and all that goes along with that.

Nuclear energy has almost zero emissions. That is a good thing. But as we create that energy we also create nuclear waste. Oconee Nuclear Station and Oconee County, South Carolina, has about 40 years worth of nuclear waste sitting on site.

The Vogtle Plant probably has the same amount.

So we have got all this nuclear waste sitting on site in dry cast or wet storage at nuclear production sites. We have in the nuclear weapons arsenal production, whether it is what happened at Hanford or Savannah River Site creating our nuclear arsenal, we have a lot of yucky stuff that is being taken out of the ground through environmental management efforts. And a cleanup site at Hanford and the EM down at Savannah River Site, we could go through Idaho and Oak Ridge and all these others, but at the end of the day we end up with a lot of yucky, highly radioactive waste, whether it is in the tank farms or whether it is the spent fuel rods that are sitting in dry and wet storage around the country. And you heard Shimkus, Chairman Shimkus mention earlier about Yucca Mountain.

We need as a nation to embrace the law of the land, which is a long-term, stable storage facility. After all the science, all the money, everything, taking money from rate payers in South Carolina to create Yucca Mountain as a long-term storage site, but yet it sits in mothballs because of politics. But the law of the land is the law of the land. So we need to do something with that waste.

Take that in consideration of what happened in South Carolina this year. I am a proponent for nuclear energy. I think it is a great source of electricity to meet the 21st Century and beyond, electricity needs to manufacture, heat and cool our homes, or whatnot, possibly power our cars. And we need to build more

nuclear power plants in this country because we have aging nuclear reactors around the country. Whether that is California or South Carolina, the facts are the facts that they are aging.

And we are starting actually to decommission some reactors in the Northeast. And some of those decommissioned reactor parts, reactors parts come to South Carolina to a storage facility in Barnwell, low -- level nuclear waste facility.

So if we are going to build new nuclear plants we need something to change, because what we just saw in South Carolina was seven, eight years into a project to build two new nuclear reactors, and the company made mistakes, defaulted, and that is mothballed. Billions of dollars, tens of billions of dollars invested and two new nuclear reactors in South Carolina that will never come online.

So going forward, wanting nuclear reactors and nuclear power to be a part of our energy matrix, how do we ensure for the investors that are going to be needed that if you invest tens of billions of dollars, mainly because of the regulatory environment that we have, the length of time it takes to permit a new power plant, how are we going to assure them that you best invest those tens of billions of dollars, and there is years of investment, time investment, how are we going to assure them that seven, eight, nine years down the road the rug isn=t going to be pulled out from under that project and those investors are going to lose that money? The rate payers that had to pay extra

are going to lose that money, as what is happening in South Carolina.

The General Assembly is debating this issue today on what rate payers do. So how do we assure the investors, how do we assure the nation we are going to meet our energy needs, we are going to be able to invest those large dollars?

I guess where I am going is how can we do it cheaper, better, faster to bring nuclear online? Is it small modular reactors? Is it shrinking the permitting process? Is it creating several pre-approved plants for nuclear reactors and replicating those, versus having a brand new permitting process over and over and over? What is the answer? Captain?

Mr. Ostendorff. Wow, there is a lot there. Yes, sir.

Mr. Duncan. And I am last, so you might have a few extra seconds.

Mr. Ostendorff. I think I would on the construction fees, again I am not, I am not a construction expert. I have been, because I have been to Summer many times and Vogtle many times, and Watts Bar 2 when there was a resumption of construction there starting six years ago. I have seen the NRC resident inspectors and construction inspectors working. I have seen the industry working. And I think one overarching piece of this is when you don=t do something for many years it is extremely difficult to start it up and do it error free the first time.

It is not an excuse. It is not a justification. It is just

a fact of life, human nature.

Some of the construction delays were associated with inadequacy of completion of engineering drawings at Summer, at AP1000. Summer was the -- earlier I mentioned the construction, the modular components for containment, there were welding problems, quality assurance problems. I would say that those on much better track today in 2018 at Vogtle than they were five years ago at Summer, even three years ago at Summer.

So part of this is we have to recognize when you have a process that sits in mothballs for a number of years and you don=t exercise it, you should not be surprised that there be problems starting it back up. That is one piece.

Small modular reactors I think are very promising. The earlier panel talked about that at some length between Department of Energy and NRC. I think there is a lot of promise there. At the same time, I think in order to see that move out there has to be a number of buyers to make economic sense for NuScale. And I think the Federal Government perhaps has a role to play there in investing. Dr. Peters has talked about that in his testimony.

The third piece -- and I will stop there due to time -- is, and Ms. Korsnick mentioned it, I do think there is a role for Congress to look at the market structure.

Anecdote: fall of 2015 when I was NRC commissioner we were meeting at FERC headquarters. Every other year we met with the

FERC group. And closure of Pilgrim in Cape Cod, Massachusetts, was being discussed. This is two years and three months ago. This was November of 2015. And one of the staff individuals said, Hey, Pilgrim is going to shut down in 2019, and 50 percent or more of the carbon-free electricity in Massachusetts will go away.

And I asked the chairman of FERC and his commissioner colleagues, Is that a concern to FERC?

And he said, No, Commissioner Ostendorff, it is not. Our job is to provide the lowest cost possible to the consumer.

And so, without some rethinking of what the role nuclear plays in the future, what a sabbatical from nuclear means for the ability to bring it back up 50 years from now, I think there is a value judgment to be made, a chance to look at markets and how we look at reliable baseload, carbon-free generation, and what human capital expertise that is unique to this technology that merits further investment.

Mr. Duncan. Mr. Chairman, I appreciate the extra time.

At any given time we have in this country over 100 small reactors floating around the seas of the world in the United States Navy without any mishap. That ought to be considered.

And also, as we continue to look at the nuclear weapon enhancement that the President talked about, remember, there is going to be yucky stuff as a residual.

And with that, I yield back.

Mr. Olson. I thank you. Before my friend leaves, you talked about the safety of our nuclear submarines. We have lost two. We have lost the Skipjack -- I am sorry, the Scorpion and the Thresher. Both sunk dramatically. And what happened, though, the design, the scram, sets itself down. It worked perfectly.

The Scorpion is coming back home from deployment; never showed up. It took us a couple months to be able to find her, like 12,000 feet of water. We go there about every five years just to check out to make sure there is no radiation coming from her. It sank in 1968. Not one thing has come out over almost 50 years. That is safety.

And seeing there are no further witnesses of which to ask questions, I would like to thank all, all the witnesses for being here today on the 98th day of the Astros being the world champs in baseball.

And before we conclude our last break, I would like to ask consent for one document for the record, a document from Uranium Producers of America. Without objection, so ordered.

[The information follows:]

**********INSERT 12**********

Mr. Olson. And pursuant to committee rules, I will remind all members that they have ten business days to submit additional questions for the record. And I ask that the witnesses submit their responses within ten business days upon receipt of those questions.

Without objection, this committee is adjourned.

[Whereupon, at 2:17 p.m., the subcommittee was adjourned.]