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**THE DEPARTMENT OF ENERGY'S IMPLEMENT-
ATION OF PRESIDENT TRUMP'S MAY 2025
NUCLEAR ENERGY EXECUTIVE ORDERS**

HEARING
BEFORE THE
COMMITTEE ON
ENERGY AND NATURAL RESOURCES
UNITED STATES SENATE
ONE HUNDRED NINETEENTH CONGRESS
SECOND SESSION

MARCH 19, 2026



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THE DEPARTMENT OF ENERGY'S IMPLEMENTATION OF PRESIDENT TRUMP'S MAY 2025 NUCLEAR ENERGY EXECUTIVE ORDERS

THURSDAY, MARCH 19, 2026

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The Committee met, pursuant to notice, at 9:30 a.m. in Room SD-366, Dirksen Senate Office Building, Hon. Mike Lee, Chairman of the Committee, presiding.

OPENING STATEMENT OF HON. MIKE LEE, U.S. SENATOR FROM UTAH

The CHAIRMAN. The Committee will come to order. Good morning to everyone and welcome. Before turning to my opening statement, I want to let all members know how we are going to proceed this morning, and I also want to thank Senator Heinrich and his staff for working with us on today's hearing.

On May 23, 2025, President Trump issued four executive orders concerning nuclear energy to help launch a renaissance in that really important area, and that increasingly important area within the energy sector of the United States. These executive orders do the following: direct deployment of advanced nuclear reactor technologies for national security, require needed reforms at the Nuclear Regulatory Commission to safely and expeditiously license nuclear facilities, employ existing Department of Energy authorities to accelerate nuclear reactor testing in the deployment of new designs, and direct comprehensive action to reinvigorate America's nuclear industrial base, secure supply chains, and prepare a workforce to ensure American nuclear energy dominance.

Today, the Senate Committee on Energy and Natural Resources will hear testimony regarding the U.S. Department of Energy's implementation of these orders from President Trump. We will receive testimony from three eminently qualified experts. They are the honorable Theodore Garrish, Assistant Secretary of Energy for Nuclear Energy; Dr. John Wagner, Director of the Idaho National Laboratory and President of Battelle Energy Alliance; and Dr. Mike Laufer, the Co-founder and Chief Executive Officer of Kairos Power. On behalf of the Committee, I welcome each of you to the Committee today.

For much of the past century, the United States operated from a position that most countries have never had—when we had reliable energy. It allowed American industry to thrive. It allowed the

economy to grow. It gave the United States a level of independence that few nations enjoy. Whenever that advantage has slipped, the consequences have been immediate. In the 1970s, supply disruption drove prices up and gave foreign producers leverage. Decisions made overseas began to overshape outcomes at home more than they had previously. Now, for the first time in decades, we are confronting some of those same pressures again. The question is no longer how we use energy, it's whether we have enough of it. Data centers are not going to wait. Advanced manufacturing is not slowing down. The systems driving artificial intelligence don't just scale down when power is scarce. They go to where the electricity is. If we cannot meet that demand here, it will be met somewhere else, we can be sure of that, because when energy tightens, everything downstream follows. This requires constant, large-scale, reliable energy, and that is where nuclear energy comes in.

So, today, we are examining whether the United States is moving quickly enough to deploy the next generation of nuclear technologies. What has long been a stable and a central part of our energy mix is becoming central to whether we can meet this demand at all. We are already seeing energy-intensive industries turn toward nuclear as a long-term solution. Russia and China both understand this. They are building reactors at scale. They are financing and exporting them across the world. They are locking in fuel supply arrangements that tie countries to their technology and their influence for decades. To put it bluntly, energy will determine the global balance of power for the next generation. If we hesitate now, we will not just fall behind, we will be operating inside a system defined by others, dependent on supply chains and standards that we didn't write. That is not a position of strength and it is not a position that the United States can accept.

But the question before us is no longer whether nuclear energy will play a role in our future, it is how much capacity we can build and how quickly we can build it. Recognizing that urgency, President Trump issued four executive orders last May to elevate the American energy industry to the next level. These orders build on previous work that has been done in Congress—bipartisan work that has been done on some of these issues. They focus on modernizing the regulatory framework, accelerating reactor testing, enabling deployment for national security applications, and rebuilding the domestic nuclear industrial base. At least three test reactors will achieve criticality by July 4th of this year. A microreactor will be deployed at a military installation by 2028. Ten new large reactors will be under construction by 2030. The Department of Energy has already begun implementing these directives, including standing up new programs and expanding the use of existing authorities. In coordination with Idaho National Laboratory, it has rolled out initiatives such as the reactor and fuel line pilot programs to support advanced reactor development and deployment. Today's hearing provides an opportunity to examine that execution, assess programs, identify remaining barriers that we still face, and determine what additional actions may be necessary to ensure that the United States leads in nuclear energy technology.

We are joined by witnesses who are directly involved in implementing and advancing these efforts, and I look forward to hearing from them.

I now recognize my friend and colleague, the Ranking Member, Senator Heinrich, for his opening remarks.

**OPENING STATEMENT OF HON. MARTIN HEINRICH,
U.S. SENATOR FROM NEW MEXICO**

Senator HEINRICH. Thank you, Chairman, and welcome to our witnesses, Mr. Garrish, Dr. Wagner, and Dr. Laufer.

Today, we will talk about the Department of Energy's implementation of President Trump's executive orders on nuclear energy, and I would like to start by just acknowledging the work Congress has done to support the growth of the U.S. nuclear energy sector. Congress has routinely affirmed the importance of nuclear energy as a key solution to meeting our national energy needs. The broad deployment of nuclear and renewable power, together, can foster a grid that is both reliable and affordable for Americans. And at a time when customers' energy bills are being driven upward by tariffs, by the war in Iran, and project delays and cancellations caused by the Secretary of Interior, we need to add large energy sources to the grid as fast as possible.

Nuclear power, especially, has many valuable attributes that can help meet the energy and resource demands of artificial intelligence in an economically and environmentally responsible way. We will hear today about efforts to advance new technologies that use novel coolants that could significantly reduce the water usage of new power plants, and we will hear about the Department's efforts to help innovate, validate, and demonstrate technologies that can one day help serve the industrial and defense sectors. These are outcomes that Congress has long sought to catalyze. For the past several years, Congress has repeatedly passed bipartisan legislation to advance nuclear energy in the United States. This Committee has supported multiple bills to accelerate the development of domestic supply chains for nuclear fuel and to enhance nuclear energy innovation.

The Nuclear Energy Innovation Capabilities Act directed the DOE to assess its ability to authorize, host, and oversee privately funded advanced nuclear test reactors at the national labs or other DOE sites. The Energy Act of 2020 authorized DOE to develop a program to support the production of advanced nuclear fuels. The Nuclear Fuel Security Act expanded those DOE efforts to support the domestic supply for low-enriched uranium fuel. And the ADVANCE Act directed the Nuclear Regulatory Commission to strengthen its workforce, develop responsible yet efficient licensing schedules, and fast-track processes for existing sites. The members of this Committee have repeatedly supported America's civilian nuclear industry, and I am pleased to have our witnesses here to update us on these efforts.

However, achieving our shared goals will rely on responsible implementation by the executive branch. Frankly, this is an area in which I would love to have greater confidence. I believe the U.S. nuclear industry needs greater confidence in the administration's policies on nuclear energy. In the same year that the President

signed the executive orders that we are discussing today, he also sought a budget that would have reduced funding for the Office of Nuclear Energy by over \$400 million, a reduction that would have surely impaired the Department's ability to execute on these important activities.

And while the Department's rhetoric on nuclear energy has been strongly supported, it has not always been clear whether this support extends to the whole of the industry or just those most familiar with the White House and members of its inner circle. I have said before that right now the U.S. grid needs every electron it can get. We need to make affordable energy affordable again in this country. Doing so requires supporting early innovation to accelerate breakthrough technologies. This applies both to new reactor technologies, but also to examining the fuel cycle.

In October, I introduced a bill with Senator Cruz, titled the Advancing Research in Nuclear Fuel Recycling Act, which would have the Department study pathways to advance innovative nuclear fuel recycling technologies. Such pathways could provide a solution for harnessing the used fuel that is currently stored at 121 sites across the United States. These technologies could provide additional nuclear fuel streams and enhance the resilience of our domestic energy infrastructure. And I soon plan to introduce the WIPP Economic Assistance Reauthorization Act, which would continue economic support for communities that host nuclear waste and support our national security activities. I am hopeful that this Committee will have the opportunity to further discuss these issues and consider legislative proposals to promote U.S. nuclear innovation.

I will close by adding that addressing energy affordability also requires promoting certainty. In the case of nuclear, that includes certainty of safety, of regulatory process, and of the Department's role under the law. The Department of Energy can be a tremendous partner to the private sector and to the states. Today, we will hear specific examples of how. These insights will emphasize how successful implementation of nuclear energy policy relies on strong partnerships—partnerships with states, with the NRC, and with the civilian nuclear industry. Our witnesses today have hands-on experience in how the public and private sectors can work together to propel innovation and further our country's goals.

I look forward to this discussion today, Mr. Chairman.

The CHAIRMAN. Thanks so much, Ranking Member Heinrich. As is evident, there is a lot of interest in this area and a lot of bipartisan enthusiasm to see these things move forward.

We are going to recognize now each of our three witnesses for their opening statements. Your written statements will also be made part of the record, but we will hear from each of you.

Assistant Secretary Garrish, we will start with you.

OPENING STATEMENT OF HON. THEODORE J. GARRISH, ASSISTANT SECRETARY FOR NUCLEAR ENERGY, U.S. DEPARTMENT OF ENERGY

Mr. GARRISH. Chairman Lee and Ranking Member Heinrich, and members of the Committee, thank you for the invitation to appear today. I really do appreciate the work that this Committee has done over the years. I have worked with this Committee on both

sides of the aisle, and I am looking forward to this year and the important steps we need to take.

The President, recognizing the importance of nuclear energy and the need to move forward, did four executive orders, and I will talk today about how our objectives deal with those particular items. There are four areas I would like to cover briefly this morning. You have my written statement already. Number one is to reestablish the domestic uranium enrichment program. Number two is to foster new bills. Three is to expand international exports of U.S. nuclear products. And finally, to establish a complete fuel cycle. So, let me go through each of those and tell you what we are doing on each.

The first is domestic enrichment. When I first came on board, I recognized this as really the biggest risk to the nuclear industry with the pending shutoff of the Russian imports. That meant that we were losing three and a half million SWUs—separative work units—which was roughly 23 percent of our total production. When I had last held this job in the 80s, the U.S. had 70 percent of the domestic market, but now we had just a very small share and much was imported. We then had to deal with trying to reestablish the domestic industry. Congress passed the very important enrichment bill providing very good funding for that possibility, and that was approximately four years ago. And one of the first tasks I took on was to establish what we have to do to get the domestic industry back and building capacity.

We have made awards for three companies to do that in the U.S., and I believe that we will be able, within the time frame of the next couple of years, to have a very viable domestic uranium enrichment industry. If we still encounter some gap, we do have the authority from the President's executive orders under the Defense Production Act to take other steps as necessary, but I think the way we are currently operating, we should be able to have a sufficient domestic supply to meet the gap.

The second area very important to us is new starts, and there are a number of areas that we have, and one is, really, the DOE programs, and that begins with the Advanced Reactor Demonstration Program (ARDP). Very large sums of money have been contributed in public-private partnerships, and we have two companies, TerraPower and X-energy, that have received substantial funds in public-private partnership to get the advanced reactor business moving. We have a ways to go, and additional funds were appropriated this year, which we are in the process of now awarding to the companies.

Second, we have the Gen III+ program, which is to deal right now with potentially small modular reactors, and we have made awards, one to TVA and GE and another to Holtec, and those are very important programs to get the SMR program moving forward. In addition to that, there are a number of other programs that we are looking at. And one of them is how do we get reactors started in the U.S.? And as you know, the Commerce Department has many programs, and I think that there will be some announcements beginning today from the Japanese tariff money that will help this process to get started. And then probably the next very important project is the pilot projects that we have in Idaho. And

those are very interesting projects. They are very small reactors. These are micros.

When I first saw the executive order which indicated that the President wanted from scratch at least three reactors critical by July 4, our 250th anniversary of the United States, I couldn't imagine how that was going to be possible. We sent out a request for applications, and we received 11. And out of that 11, it appears as if at least three or four will be able to meet that deadline, and I am very hopeful that we will be able to have these reactors operating this year. Other reactors that were also in the program are going to be active a little bit later in the year, but that is going to move forward very well.

A lot of people say, why pilots? In other words, why is this important? Well, to me, what this indicates is the enthusiasm that the U.S. can get reactors in operation, and this has been a very exciting program for us. I think it's going to lead to other activities going forward. The other thing that is important is that, out of the four reactors, we now have a safety analysis on these four, and they are very likely to go forward on that date. Two of them have future lives already. One of them for potential military establishment, and another in a foreign country that is very interested in this particular reactor. So, we already have life of these reactors moving forward into the future, which is very, very important.

The next area is international, and I just wanted to speak about that briefly. In the first Trump administration, I was very fortunate to be able to do intergovernmental agreements, and two of them that were important to us were one with Poland and one with Romania. The Polish one was for six reactors, and that process has now started. They have done the initial FEED studies, and there are three that have been contracted with the government for Westinghouse to proceed. That is a very important program, and what we are doing now is trying to also help the Polish regulator with the process of establishing those reactors and getting them into operation.

In addition, now we have other countries, Bulgaria and Slovakia, that are also very interested in moving forward.

And what we would like to do—and we have a program that we are going to establish at the Department to help these foreign countries with their certifications so that we can, at all possible, not have to go through the same licensing rigor that we do in those countries to move forward.

And the Polish government has indicated an interest in doing this. It would be my view that what we would do for the U.S. is, we would sell not only the products, but we would sell the regulatory structure that they came from, which would help expedite the process. And that is moving forward very well and we are going to make progress this year.

Finally, the last issue is completing the fuel cycle and promoting industrialization. I think a lot has changed since 1982, when the Nuclear Waste Policy Act was first enacted. What we did at that time, and Yucca Mountain was an example, we would take used nuclear fuel that was five percent used, and we would bury it in its entirety. And I tell people it's like buying a new car at the dealership, taking the car, driving it for 8,000 miles, and then taking

it to the junkyard and not using it again. It doesn't make a whole lot of sense. We have got a lot of energy in the fuel, and we have a number of companies that have come to us and said that they wanted, in the private sector, to recycle these products and make them useable and saleable into the marketplace. This is a very interesting idea, which sort of changes the equation as to how we move forward.

The second thing that has happened is the need for industrialization of this community. The thing that is amazing, when you look at—if you take all parts of the nuclear process, starting with conversion, enrichment, deconversion, fuel fab, recycling, and advanced manufacturing, and then couple that with the possibility of data centers and additional reactors, if co-located, it can save substantial money and be a very viable product for the future. This has led us to ask the states if they are interested in competing and requesting the ability to be designated as an area for this industrialization. Interestingly, we have had 24 states get back to us with interest, and I would say that there were 12 to 15 that were very serious, and probably four or five that have very serious proposals before us now. They will be provided to us by April 1st, and we will very quickly after that determine which ones are viable, go out and see these, and see if we can begin the process of sort of reinvigorating the whole process of the fuel cycle and make sure that we can use these materials. The final fuel stream is substantially less than what we were anticipating at Yucca Mountain, so this is a major change in how we would approach this, but this is a very positive development and very well received by the public.

So, these are the real issues that I see before us with the President's executive orders. I see a tremendous enthusiasm for nuclear that I have not seen before. And right now, what we need to do most of all is basically seize the moment and really capitalize on this enthusiasm and, to the extent possible, get shovels in the ground. And I look forward to working with this Committee on these very complicated problems, many of which are going to require legislation. And so, this would be a cooperative effort. The unique thing about this industry is this a bipartisan effort, and we have had tremendous cooperation between both the Republicans and Democrats. So, I am looking forward to a bright three years for the rest of the administration to see if we can make progress.

Thank you very much for the opportunity to appear today.

[The prepared statement of Mr. Garrish follows:]

Testimony of Theodore Garrish
Assistant Secretary for Nuclear Energy
United States Department of Energy
Before the
Committee on Energy and Natural Resources
Full Committee
United States Senate
March 19, 2026

Introduction

Chairman Lee, Ranking Member Heinrich, and Members of the Committee. Thank you for the opportunity to testify today, *To Examine the Department of Energy's Implementation of President Trump's May 2025 Nuclear Energy Executive Orders*. It has truly been a pleasure to work with Members on this Committee in a bi-partisan manner. I appreciate the congeniality and openness we have shared working together for many years. I am deeply honored that this Committee has confirmed me to serve in several positions at the Department, now as the Assistant Secretary of the Office of Nuclear Energy (NE).

Background

Over the last 20 years, nuclear energy has become one of the most affordable, reliable, and secure energy solutions in the United States. With 95 reactors operating at 54 sites, nuclear power plants produce 97 GW of baseload power accounting for nearly 20% of all generated electricity. Nuclear power's 92% capacity factor, coupled with its ability to operate 24/7, make it one of this nation's bedrock energy sources. It is truly a remarkable, revolutionary technology.

Important Congressional investment in nuclear technologies and recent advancements at our National Laboratories, universities, and in industry, are enabling the next generation of nuclear reactors to offer enhanced safety features, improved efficiency, greater flexibility and portability, and reduced proliferation risk. As a result of renewed interest and new capital, the Department of Energy (DOE) is meeting weekly

with new entrants pursuing a whole suite of nuclear reactor technologies and I have never seen this much enthusiasm, excitement, and movement. With widespread public support and Congress' commitment specifically from this Committee, the nuclear renaissance envisioned in the early 2000s is now becoming a reality.

Presidential Leadership

This growth has been enabled and enhanced by the President's leadership. As part of his Energy Dominance Agenda, nuclear has become an administration priority. In 2025, President Trump issued four ambitious Executive Orders (EO) including Reforming Nuclear Reactor Testing at the Department of Energy, Deploying Advanced Nuclear Reactor Technologies for National Security, and Reinvigorating the Nuclear Industrial Base. These ambitious EOs laid the groundwork for a new atomic age, which will result in 400 GW of nuclear energy capacity by 2050 through expedited licensing, increased domestic enrichment capacity, and leveraging interagency partnerships. With the leadership of Secretary Wright, I am proud to say that DOE is meeting the deadlines outlined in the EOs.

Affordability

With the exponential growth in demand, DOE is focused on bringing down the cost of energy through energy addition, and this is part of the President's affordability plan. My office is concentrating on bringing online new generation and improving the output of the existing fleet at a fraction of the cost of building a new reactor. As a result, DOE is supporting the restart of retired nuclear plants. Last Fall, DOE announced a \$1 billion loan for the Crane Restart project in Pennsylvania, bringing online 835 MW by 2027-2028. This summer DOE expects that Holtec will successfully restart Palisades, adding an additional 800 MW to the grid. My office is working with utilities to implement uprates. By uprating a reactor, a utility can improve efficiency, increase output, and extend its life at a fraction of the cost of a new large reactor, which costs billions. Given modest investment by the utilities, coupled with the Administration's technical support, I believe that uprates alone could add 2.5 GW by 2027 and 5 GW by 2029. This is part of DOE's strategy to meet the demand curve in the short term while building new capacity in the long term.

Priorities

The last time that I appeared before the Committee was for my confirmation hearing where I outlined a vision for the future. It included four key areas: enrichment, new starts, international markets, and fuel cycle. I am proud to report that we have made significant progress in each of these areas and would like to share with you my vision for the next year.

Enrichment

Starting with enrichment, a robust domestic enrichment industry is essential for U.S. energy security and prosperity. Congress astutely recognized this by passing the Nuclear Fuel Security Act and the Prohibiting Russian Uranium Imports Act. In 2024, Russian imports accounted for 20% of all enriched uranium consumed by the domestic fleet. As a result, the U.S. will have to fill the gap by producing an additional 3.043 million Separative Work Unit (SWU) to maintain the current domestic fleet.

As one of my first priorities, I am proud to announce that the Department is on track to meet the existing demand for low enriched uranium (LEU) and future demand for high assay low enriched uranium (HALEU) to fill the gap previously supplied from Russia. In January, DOE announced three \$900 million enrichment awards to produce both LEU and HALEU. Once the awardees complete construction, the U.S. will have a durable, resilient enrichment supply chain. Not only will this make America more secure, but it will support the next generation of new nuclear reactors.

New Starts

The next important priority for the Department is new builds; Small Modular Reactors (SMR), microreactors, and pilots. NE is focused on developing, demonstrating, and deploying the next generation of nuclear reactors. To begin the new builds process, DOE is continuing to make progress on its projects in the Advanced Reactor Demonstration Program (ARDP) and GEN III+ SMR program while also collaborating with the Office of Energy Dominance Financing (EDF) to support large light water reactors.

On top of our existing portfolio, the President challenged DOE to show that it is possible to build new innovative reactors with speed and efficiency. To that end, we are working with the private sector to scale to what is possible and working across the interagency, including with the Department of War, to leverage our subject matter expertise to advance nuclear energy priorities for national security while avoiding duplication of effort.

Through the Reactor Pilot Program and Launch Pad USA, the Department is working closely with new companies to expedite the DOE authorization process for new reactor technologies. This collaborative approach with industry has accelerated the development timeline from paper to product. In the President's EOs, he challenged the Department to have three new reactors hit criticality before America's 250th anniversary. Today, we are on track to meet this challenge, which is a testament of American exceptionalism and ingenuity. With the success of the Reactor Pilot program, we have applied these principles to the fuel cycle with the creation of the Fuel Line Pilot program. Partnering with industry, this program has accelerated the production of tri-structural isotropic particle (TRISO) fuel, which is integral to the next generation of reactors.

Thanks to continued Congressional support in the recent appropriations act, which repurposed billions in Infrastructure Investment and Jobs Act funds, NE has doubled down on its investment of small modular reactors through ARDP and GEN III+. I am proud to announce that these programs demonstrate several new reactor designs with vastly different technologies. Each one has a path to commercialization, profitability, and mass production. Further, these programs are part of the Department's larger strategy to deploy new reactors in the United States. Thanks to this Committee's leadership, EDF received nearly \$1 Billion in credit subsidy in recent legislation. DOE is well positioned to expedite and promote the production and operation of nuclear energy to provide affordable, reliable, safe, and secure energy to the American people.

International Markets

By demonstrating our technology at home, the United States is poised to export our technology abroad. In the first Trump Administration as Assistant Secretary of International Affairs at the Department of Energy, I helped broker intergovernmental agreements to facilitate nuclear energy projects which are expected to lead to the

development of U.S. reactor technologies in Poland and Romania. Building off this success, I hope to expand the map to new markets, particularly in Eastern Europe and Asia. Also, I am continuing to work with smaller countries who would be interested in using U.S. technology for nuclear reactor projects supported by international agreements. Not only do these instruments foster the development of partners' young civil nuclear programs, but it exposes them to our market leading technologies. Thus, when they are ready to build, they are more inclined to "Buy American." Moreover, through successful international deployments, America will prosper by offering high paid domestic wages in the United States while building 100-year relationships with other nations, enhancing U.S. national security.

Fuel Cycle

Lastly, nuclear can lead to the reindustrialization of America. On January 28, the Department issued a request for information (RFI) inviting states to show their interest in hosting a Nuclear Lifecycle Innovation Campus. This voluntary Federal-state partnership is designed to enhance economic growth, revitalize the American heartland, and establish a coherent end-to-end nuclear energy strategy. I believe hosting an innovative campus will turn participating states into regional industrial powerhouses, providing high paying jobs, improved infrastructure, and lower energy prices through the construction of advanced nuclear technologies. Since the RFI's release, the Department has had positive engagement with multiple states who are interested in being part of this new atomic age.

Conclusion

I look forward to working in partnership with members on this Committee and Congress to develop the programs and concepts that I outlined today. Together we can deliver a prosperous, secure, and affordable future. Thanks again for the opportunity to testify before the Committee and I look forward to hearing your questions.

The CHAIRMAN. Thanks so much, Assistant Secretary Garrish. We will hear now from Director Wagner.

**OPENING STATEMENT OF DR. JOHN C. WAGNER,
DIRECTOR, IDAHO NATIONAL LABORATORY**

Dr. WAGNER. Chairman Lee, Ranking Member Heinrich, and members of the Committee, I want to thank you for the opportunity to be here today. I also want to thank you for all the work that you have done on these topics and the work that you will do.

My name is John Wagner, and I am the Director of the Idaho National Laboratory, the nation's center for nuclear energy research and development. As you both mentioned in your opening remarks, we stand at an unprecedented inflection point in American nuclear energy. For the first time in decades, market forces, national security imperatives, and federal policies have achieved remarkable alignment. The question no longer is whether America needs nuclear energy, it is a question that Senator Lee mentioned, which is how much, how quickly, and how to make it happen. And that is exactly why the four executive orders that the President signed are so important, because they address those very questions. Speaking from the perspective of Idaho National Laboratory, I want to say this call for action did not find us unprepared. Executive order 14301 states that the Idaho National Laboratory has principal responsibility for constructing and testing new reactor designs. At the laboratory, we embrace that role enthusiastically, and with partners we are executing on it.

So let me tell you a little bit about what that looks like. Our DOME, repurposed from the historic EBR-II facility, will be complete and ready for its first demonstration reactor by the end of this month. Construction was accelerated by nearly a year specifically to meet the executive orders. Radiant's Kaleidos reactor is the first system scheduled to be installed, beginning next month. Our Reactor and Critical Experiment Facility—we refer to that as RACE—will support defense and space reactor systems, including Antares' reactor experiments. MARVEL, our 85-kilowatt DOE test reactor received approval for its preliminary documented safety analysis just this month, and is targeting initial criticality later this year. MARVEL, for us, is not just a reactor, it's a proof of process, restoring institutional capability in new reactor authorization that had atrophied over decades without new builds.

Under the Reactor Pilot Program, established by executive order 14301, DOE selected 10 companies and 11 projects. INL is providing direct technical support to multiple participants in that program. Companies like Aalo and Oklo broke ground at INL for their reactors last fall. To address the expanding needs of this moment, we have established the Nuclear Energy Launch Pad, a 2,000-plus acre site at the laboratory with options for other locations as well, dedicated to enabling privately funded advanced nuclear prototypes—so, think first-of-kind reactors, enrichment, fuel fabrication, recycling, and other emerging nuclear technologies. When the executive orders were signed, most people, including myself, were skeptical that three reactors could achieve criticality by July 4th. I am no longer skeptical. I am optimistic we will see it happen, and with

the full adherence to the gold standard of safety and security that the American public expects.

I want to talk about executive order 14302, directed action across the full fuel cycle. And INL has a critical role to play there, too. The Fuel Line Pilot Program selected five companies for domestic fuel fabrication. INL provides direct technical support, leveraging our unique capabilities at our materials and fuels complex. Today, we are recycling highly enriched used fuel from our Experimental Breeder Reactor II, downblending it to high-assay LEU (HALEU), and providing that fuel for Oklo's first core for their reactor, and possibly others. We are also developing advanced processes to recycle other used fuels, providing additional domestic feedstock while commercial production scales up.

Our work extends across all four executive orders and a wide spectrum of companies and federal partners. I want to also say, INL is also harnessing AI to accelerate implementation under DOE's Genesis Mission. Our goal with our PROMETHEUS project is to demonstrate an autonomous reactor designed, analyzed, manufactured, and operated by AI with minimal human intervention. Our project VULCAN is working to compress materials discovery and qualification timelines from decades to years. Early results show these AI tools have already more than doubled our development speed for key tasks. So, these are not future promises, these are things that are happening today.

But, as we all know, challenges remain, and your continued support is essential. In my opinion, we need to build new commercial power reactors at scale and we need to get started now. I look forward to announcements in the coming days. We need to continue building our domestic fuel cycle capabilities, which was mentioned. The fuel cycle remains a crucial vulnerability, and no commercial-scale HALEU production exists outside of Russia and China. We need continued progress on regulatory efficiency, although we have seen good progress there. And we need to update the Nuclear Waste Policy Act, which reflects priorities from four decades ago.

In closing, the executive orders set an ambitious course. INL has a critical role, and we are executing with urgency, with rigor, and with an uncompromising commitment to safety. We are grateful for this Committee's leadership in building the policy foundation and we look forward to your continued partnership. Thank you, and I look forward to your questions.

[The prepared statement of Dr. Wagner follows:]

TESTIMONY OF DR. JOHN C. WAGNER**LABORATORY DIRECTOR, IDAHO NATIONAL LABORATORY****BEFORE THE UNITED STATES SENATE COMMITTEE ON ENERGY AND
NATURAL RESOURCES HEARING TO EXAMINE THE DEPARTMENT OF
ENERGY'S IMPLEMENTATION OF PRESIDENT TRUMP'S MAY 2025 NUCLEAR
ENERGY EXECUTIVE ORDERS****March 19, 2026**

Chairman Lee, Ranking Member Heinrich, and members of the committee, thank you for the opportunity to testify today. My name is John Wagner, and I am the director of the Idaho National Laboratory (INL), the nation's nuclear energy research, development, and demonstration center. In this role, I lead a Department of Energy (DOE) national laboratory with more than 6,000 scientists, engineers, and support staff focused on changing the world's energy future and securing our nation's critical infrastructure.

I hold a Bachelor of Science degree in nuclear engineering from the Missouri University of Science and Technology and Master of Science and Doctorate degrees in nuclear engineering from the Pennsylvania State University. My career has been deeply involved with every aspect of the nuclear fuel cycle. My first position following graduate school was with a private company designing and licensing spent nuclear fuel storage and transportation systems. Later, during a 17-year tenure at Oak Ridge National Laboratory, I supported DOE and the Nuclear Regulatory Commission (NRC) on long-term storage, transportation, and disposal issues, ultimately serving as director of the Reactor and Nuclear Systems Division. I joined INL in February 2016, progressing from chief scientist for the Materials and Fuels Complex to associate laboratory director for the Nuclear Science and Technology Directorate before becoming laboratory director. I am the author and co-author of more than 170 refereed journal and conference articles, technical reports, and conference summaries, and a Fellow of the American Nuclear Society and the American Association for the Advancement of Science.

I am grateful for the opportunity to testify before this committee at what I believe is the most consequential moment for American nuclear energy in the past half-century.

OPENING: AMERICA'S NUCLEAR MOMENT

We stand at an unprecedented inflection point for American nuclear energy. For the first time in decades, market forces, national-security imperatives, and federal and state policy have achieved remarkable alignment. The question is no longer whether America needs nuclear energy, rather it is how much, how quickly, and how to make it happen.

This moment differs from past nuclear "renaissances" in fundamental ways. Historic energy-demand growth driven by data centers and artificial-intelligence (AI) infrastructure, unprecedented private-sector investment flowing into nuclear technologies, the emergence of genuinely new reactor developers, and critical national-security needs requiring reliable baseload power have converged with bipartisan Congressional support and a federal commitment to

removing decades of regulatory barriers. Secretary of Energy Chris Wright has stated that AI will rapidly accelerate our ability to make nuclear reactors faster, cheaper, and more capable. He has also noted that nuclear power is the only viable 24/7 non-carbon-emitting power source for the infrastructure America needs to lead the world in AI.¹ This time, market demand is driving the resurgence, not just policy aspiration.

The scale of ambition is not modest. Administration policy calls for expanding American nuclear capacity from approximately 100 GW today to 400 GW by 2050, which requires a quadrupling of the nuclear fleet in less than 30 years.² Achieving this necessitates facilitating 5 GW of power uprates at our 94 existing reactors,³ restarting shutdown reactors where possible, demonstrating and deploying the next generation of advanced microreactors and small modular reactors, and having at least 10 new large reactors under construction by 2030. Four executive orders signed in May 2025 established the most aggressive nuclear-deployment timelines in American history, with the goal of three reactors achieving criticality by July 4, 2026.⁴

China and Russia have advanced their nuclear capabilities while American deployment has stagnated for nearly 40 years, and they account for the vast majority of planned new reactors globally.⁵ China and Russia account for 94% of all reactors currently under construction worldwide (59 of 63 units) and initiated 44 of 45 reactor construction starts globally from January 2020 through mid-2025. China alone has 32 reactors under construction, while Russia's state-owned Rosatom is building 27 units, including 20 reactors in seven other countries, dominating the international-export market.^{6, 7, 8} China and Russia have engaged in successful nuclear diplomacy and have commercial nuclear export programs intended to reduce costs and increase certainty for countries interested in expanding existing nuclear programs and nuclear newcomers.⁹ Competition for nuclear expansion is not limited to terrestrial applications. China's reported collaboration with Russia on a 1.5 MW nuclear reactor deployed on the moon by

¹ Chris Wright, Secretarial Order, "Unleashing the Golden Era of American Energy Dominance." February 5, 2025. <https://www.energy.gov/articles/secretary-wright-acts-unleash-golden-era-american-energy-dominance>.

² Executive Order 14300, "Ordering the Reform of the Nuclear Regulatory Commission." May 23, 2025.

<https://www.govinfo.gov/content/pkg/FR-2025-05-29/pdf/2025-09798.pdf>.

³ <https://www.energy.gov/ne/utility-power-reactor-incremental-scaling-effort-uprise-link-to-uprise-announcement>

⁴ Executive Order 14301, "Reforming Nuclear Reactor Testing at the Department of Energy." May 23, 2025.

<https://www.govinfo.gov/content/pkg/FR-2025-05-29/pdf/2025-09799.pdf>.

⁵ Daniel Helmei and Jonas Goldman, "Reframing the U.S. Role in a New Nuclear Renaissance: Ensuring Flexibility in Fuel Procurement as a Counter to FEOC Influence." November 17, 2025. Carnegie Endowment for international Peace. <https://carnegieendowment.org/research/2025/11/reframing-the-us-role-in-a-new-nuclear-renaissance-ensuring-flexibility-in-fuel-procurement-as-a-counter-to-feoc-influence?lang=en>.

⁶ International Atomic Energy Agency (IAEA), "Six Global Trends in Nuclear Power You Should Know." November 24, 2025. <https://www.iaea.org/newscenter/news/six-global-trends-in-nuclear-power-you-should-know>.

⁷ World Nuclear Association, *World Nuclear Performance Report 2025*, January 2025. <https://world-nuclear.org/our-association/publications/global-trends-reports/world-nuclear-performance-report>.

⁸ Mycle Schneider Consulting, *World Nuclear Industry Status Report 2025: The Independent Assessment*, Paris, France, September 2025. <https://www.worldnuclearreport.org>.

⁹ Sarah Sobalvarro, "US Inaction Is Ceding the Global Nuclear Market to China and Russia." April 2, 2025. Wilson Center. <https://www.wilsoncenter.org/article/us-inaction-ceding-global-nuclear-market-china-and-russia>.

2036,¹⁰ demonstrates how our competitors are positioning nuclear technology as the foundation for long-term strategic advantage in space. We must reclaim nuclear leadership to project American values and standards globally.

Against this backdrop, INL has an essential role. The executive order "Reforming Nuclear Reactor Testing at the Department of Energy" states that "The Idaho National Laboratory has principal responsibility for constructing and testing new reactor designs."¹¹ Correspondingly, test beds are being completed, reactor components are being fabricated and assembled, fuel is being fabricated, AI tools are being developed, and much more. This work is happening now, and with an urgency that reflects what this moment demands.

The United States previously led the development of civilian nuclear power. Fifty-two reactors were designed, built, and operated at what is now INL, more than any other place in the world. This committee helped create this moment, and with your continued leadership and support, we are making this a reality.

THE POLICY FOUNDATION: WHAT HAS BEEN BUILT AND WHAT REMAINS

Legislative Achievements Creating the Framework

Congress, largely driven by this committee, has provided critical bipartisan support through landmark legislation that has fundamentally reshaped the policy landscape for nuclear energy deployment. I will summarize the essential provisions here and focus my more detailed discussion on where gaps remain and where additional legislative action is most needed.

The Infrastructure Investment and Jobs Act (IIJA) (2021) and Inflation Reduction Act (IRA) (2022) together deliver more than \$40 billion in direct funding and tax incentives that are reshaping the economics of nuclear power in the United States. The IIJA's \$6-billion Civil Nuclear Credit Program helped prevent premature closure of economically viable existing reactors. The IRA's production and investment tax credits, estimated to provide approximately \$30 billion in support for existing plants over their remaining operational lives, finally recognize nuclear energy's contribution to grid reliability in ways that wholesale electricity markets historically have not.

The Prohibiting Russian Uranium Imports Act (May 2024) banned imports of low-enriched uranium (LEU) from Russia beginning August 2024 and unlocked \$2.72 billion for domestic LEU and high-assay low-enriched uranium (HALEU) production, in addition to \$700 million specifically for HALEU from the Inflation Reduction Act. This legislation addresses one of our

¹⁰ Bhavya Lal and Roger Myers, "Weighing the Future: Strategic Options for U.S. Space Nuclear Leadership," INL/RPT-25-85616, https://inl.gov/content/uploads/2023/07/Weighing-the-Future_Strategic-Options-for-U.S.-Space-Nuclear-Leadership.pdf.

¹¹ Executive Order 14301, "Reforming Nuclear Reactor Testing at the Department of Energy," May 23, 2025. <https://www.govinfo.gov/content/pkg/FR-2025-05-29/pdf/2025-09799.pdf>.

most critical vulnerabilities: virtually all uranium currently used in American reactors is imported, with Russia supplying approximately 25–27% of enrichment services.

The ADVANCE Act (July 2024) represents some of the most significant nuclear energy legislation since the Atomic Energy Act. It modernizes the NRC through comprehensive reforms addressing longstanding barriers to advanced-reactor deployment. Most consequentially, it mandates completion of licensing reviews within 18 months for certain new reactors, eliminating the open-ended timelines that have historically plagued nuclear projects; cuts licensing fees for advanced reactor applicants by 50%; streamlines National Environmental Policy Act (NEPA) environmental review processes; and updated the NRC's mission statement, which now reads: "The NRC protects public health and safety and advances the nation's common defense and security by *enabling* the safe and secure use and deployment of civilian nuclear energy technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment." The word "enabling" represents a genuine philosophical shift in how the nation's nuclear regulator understands its role.

The FY2026 National Defense Authorization Act (December 2025) provided critical statutory clarity for Department of Defense (DoD) nuclear-energy deployment. Section 318 designates an executive agent within the DoD for installation and operational nuclear energy, establishing clear organizational accountability for what has historically been fragmented across multiple DoD components. Section 321 establishes a 10-year Navy small modular reactor pilot program for Navy shore-installation energy needs. Section 8366, the **International Nuclear Energy Act of 2025**, establishes a comprehensive legislative framework to reassert U.S. leadership in the global civil-nuclear market, authorizing \$65.5 million over fiscal years 2026–2030 for export support, establishing a Nuclear Export Working Group, and mandating pursuit of at least 20 new Section 123 peaceful nuclear-cooperation agreements.¹²

Four May 2025 Executive Orders

The four nuclear-specific executive orders signed on May 23, 2025, represent the most comprehensive Administration-led reform of American nuclear policy in recent history:¹³

EO 14302 — Reinvigorating the Nuclear Industrial Base establishes America's path to nuclear energy dominance by securing fuel supply chains, further expanding domestic uranium capabilities, and leveraging the Defense Production Act to build nuclear-industry consortia. It establishes the Fuel Line Pilot Program and directs comprehensive action across the full fuel cycle, from domestic uranium mining and enrichment through recycling and reprocessing.

EO 14301 — Reforming Nuclear Reactor Testing at DOE finds that the design, construction, and operation of non-commercial advanced reactors under DOE control are for research purposes and thus within DOE jurisdiction. It creates the Reactor Pilot Program with the goal of at least three reactors achieving criticality by July 4, 2026, authorizes DOE to expedite qualified test

¹² FY2026 National Defense Authorization Act, Public Law No. 119-60, signed December 18, 2025.

¹³ "9 Key Takeaways from President Trump's Executive Orders on Nuclear Energy." U.S. Department of Energy, Office of Nuclear Energy. June 10, 2025. <https://www.energy.gov/ne/articles/9-key-takeaways-president-trumps-executive-orders-nuclear-energy>.

reactors to operational status within two years of substantially complete applications, and explicitly recognizes INL's principal responsibility for constructing and testing new reactor designs. This order, and what it enables at INL and sites across the nation, is central to the discussion that follows.

EO 14300 — Ordering the Reform of the Nuclear Regulatory Commission mandates comprehensive regulatory reform, directing the NRC to complete rulemakings within 18 months, provide final decisions within 18 months for new reactors, adopt science-based radiation limits, and establish expedited pathways for reactors tested by DOE and DoD. It directs that the NRC accelerate many reforms identified in INL's April 2025 report, *Recommendations to Improve Nuclear Licensing*.¹⁴

EO 14299 — Deploying Advanced Nuclear Reactor Technologies for National Security positions nuclear energy as critical defense infrastructure. The Army must establish nuclear-reactor operations at a military base by September 2028, DOE must deploy advanced reactors within 30 months, and the State Department will pursue 20 new international nuclear-cooperation agreements.

These nuclear-specific orders were accompanied by EO 14303, "Restoring Gold Standard Science," which establishes that federal agencies should be "skeptical of findings and assumptions" and that "highly unlikely and overly precautionary assumptions and scenarios should only be relied upon in agency decision-making where required by law or otherwise pertinent to the agency's action." This principle has direct and significant relevance to nuclear regulation, where decades of overly conservative assumptions have imposed substantial costs without commensurate safety benefits.

What the Policy Framework Has Not Yet Fully Resolved

The legislative and executive action described above is historic. But its promises will only be realized if the underlying statutory framework enables DOE and its national laboratories to move with the speed these timelines demand. Several statutory gaps remain that this committee is well-positioned to address, and I will return to these in detail later in this testimony.

ON THE GROUND: WHAT'S HAPPENING AT INL TODAY

The four executive orders signed in May 2025 did not find INL unprepared. The work described in this section reflects INL's direct and ongoing response to those orders — accelerating test bed construction, advancing reactor demonstrations, strengthening fuel cycle capabilities, and supporting the Reactor Pilot and Fuel Line Pilot Programs. In each case, the connection to specific EO directives is explicit and the progress is measurable.

¹⁴ Stephen J. Burdick, John C. Wagner, and Jess C. Gehin, "Recommendations to Improve Nuclear Licensing." Idaho National Laboratory. INL/RPT-25-84292. <https://inl.gov/content/uploads/2024/11/Recommendations-to-Improve-Nuclear-Licensing.pdf>.

The Reactor Development Pathway and INL's Infrastructure as an Essential Enabler

For members less familiar with nuclear technology, a brief explanation provides essential context. Nuclear fission occurs when an atom's nucleus splits, releasing enormous amounts of energy. When enough fissile material is assembled in the right configuration, it achieves "criticality," a sustained fission chain reaction. Reactors are carefully designed systems that control this process to generate heat, which produces electricity.

Most advanced-reactor designs build on concepts demonstrated decades ago, many of them proven at INL. The development process follows a structured path: from initial design and fundamental research, through critical experiments demonstrating the physics, through dry or low-power criticality, to a fully operational power system generating electricity. This progression allows developers to validate safety and performance at each stage before advancing to the next. The interdependencies are significant: reactor physics, nuclear materials and fuels research, and the fuel cycle all must advance together.

These interdependencies underscore why achieving the timelines outlined in this testimony requires unprecedented collaboration across the entire nuclear-innovation ecosystem. National laboratories provide specialized testing infrastructure and research expertise, universities advance fundamental science while training the workforce, and private companies bring innovation and commercial discipline. When these sectors work in true partnership sharing data, facilities, and expertise, we can compress development cycles that historically took decades into timeframes measured in years.

No other institution in the world operates the integrated suite of facilities INL has assembled to support this development pathway. These facilities represent decades of federal investment. They cannot be rapidly replicated. And new capabilities are being designed, developed, and completed on timelines accelerated to meet the goals of the executive orders and the needs of industry.

The Reactor Demonstration Ecosystem

DOME — Demonstration of Microreactor Experiments. The former EBR-II facility is being repurposed as DOME, a premier national testing facility enabling rapid microreactor demonstrations in existing nuclear-qualified infrastructure. Construction completion, anticipated by March 31, 2026, was accelerated by almost a year from the original schedule to meet EO goals. DOME is designed for advanced microreactors up to 20 MWth using HALEU fuels, and the facility will be ready for installation of the first demonstration system in April 2026. The significance of this facility cannot be overstated. Repurposing existing nuclear infrastructure, rather than building from greenfield, dramatically reduces the time and cost of reactor demonstrations compared to any alternative approach. Radiant's Kaleidos Demonstration Unit is the first reactor scheduled for installation and testing in DOME in Spring 2026.

To support reactor testing in DOME, INL is developing a comprehensive reactor-testing ecosystem that includes facilities for fueling, transporting, defueling, and decommissioning reactors — the full lifecycle infrastructure that reactor developers cannot efficiently build themselves.

LOTUS — Laboratory for Operation and Testing in the United States. The LOTUS test bed will host experimental microreactors up to 500 kWth that require an enhanced security posture, providing a safe environment for developers to test nuclear systems going critical for the first time. LOTUS is designed specifically for first-of-a-kind reactors, providing the safety envelope and operational experience that supports subsequent NRC commercial licensing.

SPARC — System Physics Advanced Reactor Critical Facility. SPARC will reclaim U.S. capability for large-scale critical experiments using a horizontal split table, a flexible experimental capability for nuclear-physics testing of new fuels and reactor designs that this country has lacked for decades. The facility will support licensing, deployment, and optimization of advanced fuels and reactors and has received strong industrial support that demonstrates its direct relevance to EO implementation. INL is leading engineering, installation, and future operations, with collaborative support from Oak Ridge National Laboratory, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory.

RACE — Reactor and Critical Experiment Facility. RACE will support defense and space reactor systems, including Antares' reactor experiments and future programs. The facility structure originally housed the ML-1 reactor in the 1960s and will undergo anticipated modifications to support upgrade to Hazard Category 2 nuclear facility status.

Together, DOME, LOTUS, SPARC, and RACE constitute an integrated ecosystem for nuclear demonstration that is unique in the world. Each facility serves a distinct purpose in the development pathway, and together they enable INL to support multiple reactor technologies simultaneously at different stages of development. No foreign competitor possesses a comparable integrated system.

Reactors in Progress: Real Milestones, Real Dates

Microreactor Applications Research Validation and Evaluation (MARVEL). This 85 kW DOE test reactor is helping INL reestablish the full capability to develop new reactor systems from concept through operation. MARVEL provides a research platform for understanding microreactor applications while supporting licensing, environmental assessments, and deployment strategies. Recent milestones include completion of the Primary Coolant Apparatus Test in May 2025, submission of the updated Preliminary Documented Safety Analysis in September 2025, and start of fuel fabrication at TRIGA International in November 2025. Initial dry criticality is targeted for late in calendar year 2026.¹⁵ MARVEL is not just a reactor, it is proof of process. Its successful development has restored institutional muscle in new reactor authorization that had atrophied during decades without new builds.

The Reactor Pilot Program (EO 14301). As of December 2025, ten companies and eleven projects have been selected as participants: Aalo Atomics, Oklo, Radiant, Antares, Natura Resources, Deep Fission, Terrestrial Energy, Last Energy, Valar Atomics, and Atomic Alchemy.¹⁶ INL is providing direct technical support to multiple participants, including infrastructure access,

¹⁵ Learn more at <https://inl.gov/marvel/>.

¹⁶ U.S. DOE, "U.S. Department of Energy Reactor Pilot Program." Accessed January 2026. <https://www.energy.gov/ne/us-department-energy-reactor-pilot-program>.

safety analysis support, and fuel cycle services. Multiple reactors are targeting the July 4, 2026, criticality deadline.¹⁷ I am optimistic that we will see at least three reactor criticalities by July 4 of this year and that these reactors will demonstrate that achievement with full adherence to the gold standard of safety and security the American public expects.

Project Pele. Developed by BWXT for the DoD, Pele is a mobile microreactor delivering 1–5 MW of electrical power that will help our armed forces reduce dependence on diesel fuel in remote or emergency locations. INL received TRISO fuel in November 2025,¹⁸ validating the fuel supply chain and paving the way for military and eventual commercial applications. Full-power demonstration operations are planned for late 2028 at INL's Critical Infrastructure Test Range Complex,¹⁹ with early 2028 initiation of testing.

The Fuel Cycle: INL's Unmatched Capabilities at the Materials and Fuels Complex

INL is not just a reactor institution – it is a fuel cycle institution, and that distinction is strategically important. The nation's 400-GW ambition cannot be achieved without a comprehensive domestic fuel cycle, and INL's Materials and Fuels Complex (MFC)²⁰ represents the most capable fuel-cycle research infrastructure in the United States.

The Hot Fuel Examination Facility²¹ enables post-irradiation examination of spent fuel to understand performance and failure mechanisms that no other facility can match. The Fuel Cycle Facility produces HALEU from spent nuclear fuel from EBR-II through pyroprocessing of DOE-owned sodium-bonded metal fuel. This uranium recovered and downblended from highly enriched uranium provides a critical bridge supply while commercial HALEU capabilities develop.

HALEU: The Fuel Supply Challenge. HALEU, uranium enriched to 5–20% U-235, enables advanced-reactor designs to achieve smaller physical footprints with improved efficiency. Currently, no commercial-scale HALEU production exists outside of Russia and China, and commercial supply remains effectively monopolized by Russia's Tenex. INL and other DOE facilities are working to provide meaningful quantities to industry from existing inventories, and the Centrus enrichment demonstration facility in Ohio has produced approximately 900 kg of HALEU as of June 2025 — the first domestic HALEU enrichment in over 70 years.²² But projected demand through the 2026–2030 period from advanced reactor demonstrations, military deployments, and early commercial orders will far exceed current production capacity. Advanced-reactor demonstrations, military deployments, and potential commercial orders will

¹⁷ Neil Ford, “Nuclear Startups Bullish on Hitting US Pilot Program Deadlines.” Reuters. February 24, 2026. <https://www.reuters.com/business/energy/nuclear-startups-bullish-hitting-us-pilot-program-deadline--reeii-2026-02-24/>.

¹⁸ INL Media Relations, “INL Advances Department of Wars Project Pele Demonstration Microreactor with First TRISO Fuel Delivery.” December 2, 2025. <https://inl.gov/news-release/inl-advances-department-of-wars-project-pele-demonstration-microreactor-with-first-triso-fuel-delivery/>.

¹⁹ Learn more at <https://inl.gov/national-security/test-range-facilities/>.

²⁰ Learn more at <https://inl.gov/mfc/>.

²¹ Learn more at <https://inl.gov/document/hot-fuel-examination-facility/>.

²² Centrus Energy, HALEU production update, June 2025.

all compete for limited HALEU supplies during this critical period. This is why recent decisions to pursue nuclear fuel recycling and maximize the beneficial use of DOE-owned material inventories are so critical.

INL has developed the Zirconium Extraction (ZIRCEX) process specifically to recover HEU from a range of used fuels, then downblend the recovered uranium to HALEU levels, providing an important additional domestic feedstock. Used fuel from INL's Advanced Test Reactor and other similar sources across the DOE complex have also been identified as a potential HALEU resource. These pathways require time and investment, but they represent meaningful opportunities to diversify the domestic HALEU supply chain.

The Fuel Line Pilot Program, established under EO 14302, is accelerating domestic fuel fabrication by establishing a domestic nuclear-fuel supply chain under DOE authorization. Five companies have been selected: TRISO-X (X-energy), Oklo, Terrestrial Energy, Standard Nuclear, and Valar Atomics.²³ INL is providing technical support to each, leveraging MFC capabilities that cannot be replicated outside a national laboratory context.

Back End of the Fuel Cycle: Center for Used Fuel Research at INL

A significant and timely step toward addressing the back-end challenge came in January 2026, when DOE formally established the Center for Used Fuel Research at INL,²⁴ officially designating the laboratory as its leading institution for research, development, and demonstration efforts concerning used nuclear fuel management. This designation delivers on a key element of the 1995 Idaho Settlement Agreement and was made possible by a targeted waiver of that agreement reached between DOE and the State of Idaho in April 2025, a testament to the kind of creative, mission-focused partnership that this nuclear moment demands. The Center is designed as a national and international hub, operating through a hub-and-spoke model that connects INL with other national laboratories, universities, and industry partners across the country and abroad. Its mandate to support safe storage and transportation of both commercial and DOE-managed used nuclear fuel while building public confidence and advancing technical solutions addresses one of the most consequential and long-deferred responsibilities in the entire nuclear enterprise. The Center gives the nation's premier nuclear laboratory a formal, funded institutional home for the used-fuel challenge, and this committee's sustained support for the Center's research agenda will be essential to translating that designation into durable national progress.

Nuclear Waste Management.

A comprehensive nuclear strategy requires addressing the full fuel cycle, including the back end. DOE's pursuit of state-led nuclear innovation campuses marks a significant and much-needed step forward in ultimately addressing the nation's nuclear waste management stalemate. But it is only a first step. The Nuclear Waste Policy Act of 1982, as amended in 1987, reflects national priorities from four decades ago, designed for a nuclear landscape dominated by large light-water

²³ U.S. DOE, "U.S. Department of Energy Fuel Line Pilot Program." <https://www.energy.gov/ne/energy-department-fuel-line-pilot-program>.

²⁴ U.S. DOE, Department of Energy Establishes Center for Used Fuel Research at Idaho National Laboratory." January 14, 2026. <https://www.energy.gov/ne/articles/department-energy-establishes-center-used-fuel-research-idaho-national-laboratory>.

reactors with no consideration of advanced-reactor fuel cycles, potential recycling pathways, or the need for consolidated interim storage while permanent disposal solutions are developed. As I testified before this committee in November 2023, only Congress can provide the updated framework needed to address the full spectrum of spent-fuel management challenges facing our expanding nuclear enterprise. That need has only grown more urgent as the advanced reactor fleet begins to take shape. However, updating this framework is a complex undertaking that must be pursued thoughtfully and in partnership with DOE and interested states — and the time to begin is now.

The Nuclear Energy Launch Pad: Bridging the Demonstration Gap

One of the challenges facing every nuclear energy "renaissance" of the past 30 years was that technology that works in a laboratory or test environment cannot make the leap to commercial deployment because the intermediate demonstration step is prohibitively expensive, time-consuming, and uncertain. The Nuclear Energy Launch Pad is INL's answer to this chronic failure point.²⁵

Launch Pad INL establishes the nation's first modern, comprehensive nuclear-demonstration ecosystem, a 2,000+ acre dedicated site at INL specifically designed to support privately funded advanced nuclear facilities across the full spectrum of reactor demonstration and fuel-cycle activities. The site accommodates advanced reactors of diverse designs and scales, fuel-fabrication facilities for new fuel forms, fuel-recycling and reprocessing operations, and other innovative nuclear technologies. The Launch Pad INL pathway is complemented by Launch Pad USA, a second pathway that allows developers to demonstrate at other DOE sites, national laboratories, or non-federal locations nationwide all with the flexibility to leverage regional and site-specific advantages.

The concept leverages the successful NASA Stennis and Marshall Space Flight Center models, which fundamentally reimagined how the United States supports aerospace innovation by consolidating shared infrastructure that individual developers cannot efficiently duplicate. Launch Pad provides established frameworks and shared infrastructure that allow developers to focus resources on their core technologies. Rather than requiring each company to independently navigate site characterization, environmental reviews, infrastructure development, and regulatory pathways — processes that typically consume years and millions of dollars — developers can turn their first shovel of dirt without duplicating work that Launch Pad has already done for them.

A critical feature of Launch Pad is its dual-pathway approach to regulatory strategy. Developers can choose between DOE authorization pathways that accelerate demonstration timelines or pursue NRC licensing for facilities intended for commercial power production or services. This recognizes that different technologies and different business models require different regulatory frameworks, while preserving the option to transition from DOE-authorized demonstrations to NRC-licensed commercial operations as technologies mature. Successful demonstrations under DOE authorization provide validated operational data and regulatory precedents that advance subsequent NRC licensing and commercial deployment at private sites.

²⁵ Learn more at <https://nrc.inl.gov/nuclear-energy-launch-pad-at-idaho-national-laboratory/>.

ACCELERANTS: AI, THE NUCLEAR RESURGENCE, AND AMERICA'S GLOBAL POSITION

AI as INL's Force Multiplier

The connection between artificial intelligence and nuclear energy is not metaphorical, it is operational, and it runs in both directions. AI accelerates nuclear development; nuclear enables AI infrastructure. Understanding both directions is essential to grasping the strategic significance of INL's current work.

INL is collaborating with world leaders in AI, including Amazon, Microsoft, NVIDIA, and Atomic Canyon, to develop customized generative-AI tools aimed at enhancing design, safety analysis, manufacturing, and operational processes. In partnership with Oak Ridge and Argonne National Laboratories, INL recently showcased a conceptual design tool capable of generating 3D computer-aided design models, building multi-physics input decks, running advanced simulations, and rendering results with significant automation. While this research is still in its early stages, it demonstrates a promising integration of national-laboratory simulation capabilities and industry generative-AI models that has the potential to revolutionize the design process. INL has also begun initial automation of documented safety analyses in the DOE-STD-3009 format. This work is still led by human engineers, but with automation potential that could significantly reduce the time required for preparing documentation for submission. In the realm of reactor operations, INL has achieved the first autonomous non-nuclear demonstration at the MAGNET test bed²⁶ and the first digital twin of a nuclear reactor in collaboration with Idaho State University.²⁷

Early feedback from INL researchers using AI for development of nuclear modeling and simulation applications indicates that development speed has more than doubled for tasks such as drafting documentation, writing tests, and integrating algorithm details into code. These tools have also been invaluable in debugging and resolving compilation errors. The productivity gains are real and growing.

PROMETHEUS is INL's nuclear moonshot: a first-of-its-kind demonstration of an autonomous reactor designed, analyzed, manufactured, and operated by AI systems with minimal human intervention. By validating a complete AI-driven pipeline from generative design and autonomous safety analysis to advanced manufacturing and operations, PROMETHEUS promises up to fivefold schedule acceleration and multi-billion-dollar cost savings, enabling rapid deployment of reactors for critical applications such as AI data centers and national-security missions.

VULCAN tackles one of the most persistent bottlenecks in nuclear innovation: materials discovery and qualification. Through AI-driven discovery, high-throughput autonomous experimentation, and regulatory-compliant data generation, VULCAN could compress decadal

²⁶ Learn more at <https://inl.gov/document/microreactor-agile-non-nuclear-experimental-test-bed-magnet/>.

²⁷ U.S. DOE, "Idaho National Laboratory Demonstrates First Digital Twin Simulated Microreactor," July 14, 2022, <https://www.energy.gov/ne/articles/idaho-national-laboratory-demonstrates-first-digital-twin-simulated-microreactor>.

timelines to years, potentially unlocking revolutionary alloys and fuels essential for advanced reactors. The limiting constraint on advanced reactor deployment is often not reactor design but materials qualification, a process that has historically consumed 10 to 20 years. VULCAN directly attacks that constraint.

The Genesis Mission represents DOE's coordinated national effort to accelerate AI adoption across all 17 national laboratories, creating a unified framework that applies AI to complex scientific and engineering challenges.²⁸ INL's PROMETHEUS and VULCAN are contributing to this national framework, positioning the laboratory system as a cohesive force in advancing nuclear technology applications. The Genesis Mission will apply this platform to nuclear-energy challenges creating a new paradigm for nuclear energy that shortens development timelines while strengthening safety and performance.

The AI-nuclear symbiosis has a concrete institutional expression that this committee should understand: an advanced reactor co-located with a data center at a national laboratory would demonstrate this partnership in action. The reactor provides reliable, clean power for energy-intensive AI computing; AI algorithms continuously optimize reactor operations and accelerate safety validation. This pairing addresses two challenges simultaneously, and it has commercial precedent with Microsoft's 20-year commitment to Three Mile Island Unit 1, now the Crane Clean Energy Center, and similar announcements from Google, Amazon, and Oracle demonstrating the market pull that makes this economic model viable.

The Global Stakes: Why Speed Matters

The urgency of INL's work and the importance of removing statutory barriers need to be fully understood in the context of what our global competitors are doing.

China and Russia have advanced their nuclear capabilities while American deployment has stagnated for nearly 40 years. They account for 94% of all reactors currently under construction worldwide: 59 of 63 units. China alone has 32 reactors under construction; Russia's state-owned Rosatom is building 27 units, including 20 reactors in seven other countries, dominating the international export market.²⁹ Since 2017, 92% of all nuclear-reactor construction starts globally have been Chinese or Russian designs. China is likely to become the world's leader in nuclear capacity by 2030, surpassing the United States.

China's reported collaboration with Russia on a 1.5 MW nuclear reactor deployed on the moon by 2036 demonstrates how our competitors are positioning nuclear technology as the foundation for long-term strategic advantage in space.³⁰ We must reclaim nuclear leadership across all domains.

²⁸ Learn more at <https://genesis.energy.gov/>.

²⁹ International Atomic Energy Agency, "Six Global Trends in Nuclear Power You Should Know." November 24, 2025. <https://www.iaea.org/newscenter/news/six-global-trends-in-nuclear-power-you-should-know>; World Nuclear Association, *World Nuclear Performance Report 2025*, January 2025.

³⁰ Bhavya Lal and Roger Myers, "Weighing the Future: Strategic Options for U.S. Space Nuclear Leadership." INL/RPT-25-85616.

What's at stake is not merely market share. Nations purchasing nuclear reactors select not just technology, but long-term strategic partners. The vendor relationship encompasses fuel-supply and enrichment services, operational training and technical support, maintenance and component manufacturing, regulatory-framework development, research collaboration, and nonproliferation monitoring across a 60-to-80-year operational relationship. When American companies win reactor contracts, these relationships advance U.S. foreign-policy objectives, strengthen alliances, and ensure global nuclear development follows robust safety and security standards. When China or Russia win, they export their standards, their fuel relationships, and their geopolitical influence for generations.

The competition for nuclear exports is ultimately a competition to shape the global nonproliferation regime itself.

Recent developments suggest meaningful opportunity for American resurgence. Poland selected Westinghouse AP1000 technology for its first nuclear power plant — a three-unit project valued at approximately \$47 billion, representing a major strategic win for the U.S.-Polish partnership.³¹ Ukraine has committed to nine AP1000 reactors.³² Bulgaria selected the AP1000 in 2023 for two units at the Kozloduy site.³³ Romania selected NuScale for SMR deployment. Other countries are actively evaluating AP1000 reactors and other U.S. technologies.

The Domestic Deployment Imperative for Export Success. The key link between what happens at INL and what happens in Poland or Romania is this: foreign customers purchase proven technology. A 2024 INL analysis identified 65 potential sites across the United States where AP1000s could be deployed, finding that 18 are particularly promising for near-term deployment, with an additional 29 sites having strong potential.³⁴ Industry analysis suggests subsequent AP1000 deployments beyond Vogtle could achieve 25–55% construction-cost reductions through standardized designs, modular construction techniques, an experienced workforce, and established supply chains.³⁵ DOE analysis projects that the next AP1000 could achieve leveled costs under \$100/MWh, approaching approximately \$60/MWh with available incentives and construction improvements. That trajectory creates a fundamentally different competitive picture than the \$30 billion that Vogtle Units 3 and 4 cost, and it enables U.S. companies to compete for the hundreds of billions of dollars in global reactor contracts that will be awarded over the coming decades.

³¹ U.S. Department of Energy, "United States Signs Agreement to Advance American Civil Nuclear Deal in Poland." April 28, 2025. <https://www.energy.gov/articles/united-states-signs-agreement-advance-american-civil-nuclear-deal-poland>.

³² World Nuclear News, "Work under way for first Westinghouse AP1000 in Ukraine." April 15, 2024. <https://www.world-nuclear-news.org/Articles/Work-under-way-for-first-Westinghouse-AP1000-in-Uk>.

³³ Westinghouse Electric Company, "Westinghouse Signs Contract for Engineering of AP1000 Reactors in Bulgaria." Press release, November 4, 2024.

³⁴ Bradley J. Williams, John C. Wagner, and Jess C. Gehin, "Opportunities for AP1000 Deployment at Existing and Planned Nuclear Sites." Idaho National Laboratory. INL/MIS-24-80216. August 2024. https://inldigitallibrary.inl.gov/sites/STI/STI/Sort_128167.pdf.

³⁵ Ryan Spangler et al., "Potential Cost Reduction in New Nuclear Deployments Based on Recent AP1000 Experience." Idaho National Laboratory. INL/RPT-25-84701. https://sai.inl.gov/content/uploads/29/2025/06/M3_SAI-AP1000_Lessons_Rev6-nocomments-002.pdf.

No amount of export financing, no expansion of Section 123 agreements, and no diplomatic engagement can substitute for the credibility that comes from active domestic deployment and operational experience. Every advanced reactor INL demonstrates builds the U.S. export case.

The International Nuclear Energy Act of 2025, included in the FY2026 NDAA, creates important tools including a Nuclear Export Working Group, \$65.5 million for export support and technical assistance, a strategy to counter Rosatom influence, and direction to pursue 20 new Section 123 agreements. These tools will be far more effective in the hands of a country that is actively building and demonstrating advanced reactors at home.

THE CASE FOR EXPANDED DOE AUTHORIZATION

This section addresses what I believe is an important and actionable policy contribution this committee can consider to further accelerate and support America's nuclear buildout. The ADVANCE Act has reformed the NRC. The executive orders have pushed DOE to move with new urgency. But the statutory foundation for DOE's authorization role, the framework that determines what private-sector reactors can proceed under DOE authority versus what requires NRC licensing, contains gaps and ambiguities that are already creating friction and may impede progress as the Reactor Pilot Program and Launch Pad advance.

I want to be precise about the committee's role here. The Senate Committee on Energy and Natural Resources has direct jurisdiction over DOE programs and activities. The Senate Committee on Environment and Public Works (EPW) has jurisdiction over the NRC. Accordingly, the DOE authorization recommendations I make in this section fall squarely within this committee's purview. Recommendations that require changes to the Atomic Energy Act as administered by the NRC will ultimately need to work through the EPW Committee, and I will note those distinctions clearly.

How the Current Authorization Framework Works and Where It Falls Short

INL has published detailed analysis of these statutory questions in its April 2025 report, *Recommendations to Improve Nuclear Licensing*, which I commend to the committee's attention as a technical resource.³⁶ I will summarize the key issues here.

The basic principle is straightforward: Section 110 of the Atomic Energy Act provides that nothing in that law shall be deemed to require a license from the NRC for "the construction or operation of facilities under contract with and for the account of [DOE]." This starting position means that nuclear facilities operated under DOE contracts, for example, test reactors operated at national laboratories, do not need an NRC license and can proceed under DOE authorization.

The complication arises from Section 202 of the Energy Reorganization Act, which carves out certain categories of facilities that are subject to NRC licensing notwithstanding AEA Section 110. The most consequential of these carve-outs covers "other demonstration nuclear reactors" when "operated in any other manner for the purpose of demonstrating the suitability for commercial application of such a reactor." The problem is that this language is undefined, and

³⁶ Burdick, Wagner, and Gehin, *Recommendations to Improve Nuclear Licensing*, INL/RPT-25-84292 (April 2025). See *supra* note 19.

one could reasonably argue that virtually any demonstration project with a private company proponent is being pursued as part of eventual commercial application. This ambiguity has the potential to force projects into NRC licensing timelines that may create challenges to meeting the ambitious goals and timelines of EO 14301 and the same ambiguity creates the risk that individual facilities may face conflicting DOE and NRC jurisdictional claims.

There is a second, more fundamental gap. DOE's existing authorization authority is strongest for non-commercial nuclear activities conducted at government-owned or -controlled sites. But the growing demand for commercial-scale nuclear on federal lands to power AI data centers, support defense applications, and demonstrate technologies in operational environments creates situations where the technology and the site meet DOE's goals but the commercial nature of the power sale appears to require NRC licensing under longer timelines.

What Expanded DOE Authorization Would Enable

INL's *Recommendations to Improve Nuclear Licensing* report identifies two specific statutory actions this committee can advance:

First, clarify DOE's authority for non-commercial demonstration reactor projects with no exceptions (Atomic Energy Act reform). The preferred approach is to delete the "other demonstration nuclear reactors" exception from ERA Section 202 in its entirety, or to clarify it so that the NRC has licensing jurisdiction for DOE projects only for reactors that commercially sell electricity or another commercial product to an entity other than DOE. Projects constructed and operated under contract with and for the account of DOE, which do not sell commercial power, should be allowed to proceed under DOE authorization regardless of whether the intended design is the commercial design. There is no incentive for a private company to pursue a project at a national laboratory site without selling power unless the project is needed for research and development purposes and the cost simply cannot be justified otherwise. Requiring NRC licensing under these conditions could add significant time and cost without commensurate safety benefit. Note: this change to ERA Section 202 will require coordination with the Senate EPW Committee given its jurisdiction over the NRC.

Second, expand DOE's statutory authority, with appropriate limitations, to authorize commercial reactor projects on federal lands. This committee can act directly on a broader and more immediately consequential change: legislation explicitly authorizing DOE to authorize construction and operation of commercial nuclear reactor projects on federal lands. This builds on DOE's 70-year track record of safe reactor authorization including INL's 52 authorized reactors and extends it to the growing category of commercial applications on DOE sites.

At INL alone, the nuclear energy demand associated with prospective AI data center partnerships, military applications, and commercial technology demonstrations creates a category of projects that the nation needs within years, not decades. Although there have been recent improvements, NRC licensing timelines may not be able to accommodate these goals. DOE, with its deep expertise in reactor authorization, existing site infrastructure, and mission alignment with the national interest, is the right authorizing body for commercial applications on federal lands. Limiting this authority to federal lands maintains a clear geographic boundary while meeting the demonstrated need.

INL's analysis suggests at minimum a more limited change would be valuable as an interim measure, such as: authorization for DOE to authorize first-of-a-kind reactors on federal lands for up to 10 years of initial operation, with a clear framework for transitioning to NRC oversight for commercial continuation. This approach allows reliance on the efficiencies of DOE authorization in a first-of-a-kind environment while preserving the integrity of the NRC's commercial licensing role.

In addition, growing federal energy requirements, especially related to the need for mass buildout of data centers to meet various national security needs, including execution of the Genesis mission, and growing intel community requirements, would significantly benefit from improved contracting mechanisms. Specifically, granting broader authority for DOE and other agencies to enter into long-term power purchase agreements, including by permitting price premiums for national security needs, would help the federal government serve as early adopters of advanced nuclear reactors. Such authority would not only serve growing federal requirements, but also play a significant role in reducing risk for future utility-led deployments.

Safety Is Strengthened, Not Compromised

I anticipate the natural concern that this recommendation raises, and I want to address it directly: expanded DOE authorization is not regulatory relaxation. It is the application of a rigorous, experienced, evidence-based authorization framework to a broader category of nuclear activities. This distinction matters.

As I have communicated to INL's own workforce in the context of DOE's recent order reforms: the fundamental commitment to nuclear safety does not change. What changes is how we demonstrate compliance with regulatory limits. INL subject-matter experts, people who have devoted careers to nuclear safety, provided significant input in developing updated DOE directives to ensure that any changes maintain or enhance safety while enabling the urgent mission ahead. Our team drew on real operational data, radiological protection science, and practical experience to identify requirements that had become administrative burdens without corresponding safety benefits. The safety standards have not changed. What has changed is the requirement to submit redundant paperwork to multiple entities documenting compliance.

The DOE authorization framework includes the Documented Safety Analysis process, robust operating experience, and the analytical rigor of national laboratory safety expertise that has supported 52 reactor operations at INL. Stop work authority, the right and responsibility of any worker to stop work if safety is compromised, remains absolute. The flexibility created by expanded DOE authorization demands more professional judgment and responsibility, not less.

Furthermore, DOE-authorized demonstrations are not the final word on commercial safety. They generate the operational data, collected under real conditions, with real materials, in real environments, that makes subsequent NRC commercial licensing more rigorous and better-grounded in reality. The reactors demonstrated under DOE authority at INL over the past 70 years provided the technical foundation for the NRC's licensing frameworks. Expanded DOE authorization continues this tradition of building safety knowledge through operational experience, rather than attempting to resolve all safety questions through analysis before a single watt of electricity is generated.

INL's January 2026 report, *Reassessing Double-Ended Guillotine Break Requirements: Evidence-Based Analysis of Regulatory Assumptions After Five Decades of Nuclear Operation*, illustrates this principle in a specific technical context.³⁷ After more than 20,000 reactor-years of global commercial nuclear operation, zero double-ended guillotine breaks (DEGB: the complete, instantaneous circumferential severance of primary coolant piping) have been documented in commercial reactor coolant systems. Yet DEGB remains the fundamental design-basis assumption driving emergency core cooling system sizing, structural protection requirements, and containment design specifications, imposing estimated costs of hundreds of millions of dollars per plant without commensurate safety benefit. This is precisely the kind of outdated, legacy conservatism that the Gold Standard Science executive order directs agencies to revisit. The report recommends removing DEGB from design-basis requirements through formal rulemaking, not case-by-case exemptions, so that the technical basis applies consistently across the fleet. The NRC, under direction from EPW-jurisdictioned legislation and EO 14300, is the appropriate body to act on this specific recommendation. But it illustrates the broader principle: evidence-based regulation strengthens, rather than weakens, the safety culture that distinguishes American nuclear from all competitors.

Specific Legislative Changes Within This Committee's Jurisdiction

There are three specific legislative actions within this Committee's jurisdiction over DOE programs that I encourage the committee to consider:

1. Congressional direction clarifying that DOE may authorize offsite DOE activities for which it has statutory authority, including activities not located on government-owned or -controlled sites, without additional NRC approval, removing the geographic limitation in NRC regulations that has no statutory basis.
2. Congressional direction explicitly authorizing DOE to authorize construction and operation of commercial nuclear reactor projects on federal lands, with appropriate scope and oversight provisions to ensure safety, security, and environmental protection requirements are maintained.
3. Support for INL's Launch Pad infrastructure development, recognizing that the demonstration ecosystem is national energy security infrastructure, not simply laboratory support. The integration of site preparation, regulatory guidance, shared infrastructure, and operational support that Launch Pad provides cannot be replicated by private investment alone.

The committee should also communicate to the Senate EPW Committee the urgency of complementary NRC reforms, including elimination of the mandatory hearing requirement for new reactor licensing actions, a procedural step that adds months to the critical path of every new reactor license without any practical safety benefit, as INL's analysis of mandatory hearings from

³⁷ Kevan Weaver, John Wagner, Timothy Stout, Svetlana Lawrence, and Scott Ferrara, "Reassessing Double-Ended Guillotine Break Requirements: Evidence-Based Analysis of Regulatory Assumptions After Five Decades of Nuclear Operation." Idaho National Laboratory. INL/RPT-26-90155. January 2026.
https://inl.gov/content/uploads/2026/02/INLRPT_26-90155_DEGB-Technical-Assessment.pdf.

2009 through 2023 demonstrated. The Efficient Nuclear Licensing Hearings Act (H.R. 6464, S. 4288), pending in both chambers, would address this directly.

CHALLENGES AND WHAT CONGRESS CAN DO

The Fuel Cycle Bottleneck: America's Critical Vulnerability

The current state of America's nuclear fuel cycle represents a critical vulnerability that must be addressed urgently and in parallel with reactor demonstrations. We import virtually all of the uranium used in American reactors, maintain limited domestic enrichment capacity with only one facility capable of meeting approximately one-third of current fleet needs³⁸ and possess virtually no commercial-scale HALEU production capability. This dependence on foreign sources, particularly from adversary nations, creates both national-security risks and supply-chain uncertainties that threaten our energy security and ability to achieve deployment goals.

The Russian uranium ban and the associated Nuclear Fuel Security Act authorities and \$2.72 billion in funding represent significant progress, but the execution timeline is critical: investments recently made by DOE will likely result in commercial fuel availability in the early 2030s. That is why expanding our efforts and aggressively working to minimize unnecessary delays across multiple parallel pathways are essential. Urenco's New Mexico facility plans a 0.7 million separative-work-unit expansion by 2027. Orano's Oak Ridge facility is targeting 1 million separative work units by 2030. Centrus is scaling HALEU production from 2026 onward. New entrants such as General Matter are also expanding the field of commercial uranium enrichment. Finally, INL's ZIRCEX process is in development to recover and downblend HEU from spent fuels, providing an additional domestic feedstock option.

Even with rapid progress across all of these initiatives, we face significant challenges meeting projected HALEU demand through this decade. Commercial efforts to date are primarily focused on addressing much needed enrichment and deconversion needs. However, we must also produce more uranium ore and expand conversion capability needed to enable enrichment. In addition, DOE can and should do more to bridge the HALEU gap. Sustained federal appropriations beyond initial investments and legislative support for INL's fuel cycle infrastructure at MFC and related capabilities across the complex are essential to bridging the gap.

The committee should also support DOE's January 2026 initiative to establish Nuclear Lifecycle Innovation Campuses,³⁹ a new effort to modernize the nation's full nuclear fuel cycle through voluntary federal-state partnerships designed to advance regional economic growth and build a coherent, end-to-end nuclear energy strategy. The proposed campuses would support activities spanning the full fuel lifecycle, including conversion, enrichment, fuel fabrication, recycling of used nuclear fuel, and final waste disposition, with the flexibility to also host advanced reactor deployment, power generation, advanced manufacturing, and co-located data centers depending

³⁸ URENCO press release, "URENCO USA Expands U.S. Enrichment Capability With Second New Cascade." September 10, 2025. <https://www.urenco.com/news/usa/2025/urenco-usa-expands-u.s-enrichment-capacity-with-second-new-cascade>.

³⁹ U.S. DOE, "Department of Energy Seeks Hosts for Nuclear Innovation Lifecycle Campuses." January 28, 2026. <https://www.energy.gov/articles/department-energy-seeks-hosts-nuclear-lifecycle-innovation-campuses>.

on state priorities and regional capabilities. DOE issued a Request for Information on January 28, 2026, inviting states to express interest and provide feedback on campus structure, with responses requested by April 1, 2026. This initiative reflects exactly the kind of integrated, whole-of-fuel-cycle thinking that the nuclear resurgence demands and congressional support for the partnerships, infrastructure investments, and funding structures that will be required to establish and sustain these campuses will be essential to their success.

The Regulatory Gaps That Remain

The ADVANCE Act and the May 2025 executive orders deliver substantial improvements to the regulatory landscape. But important challenges remain.

The NRC's 18-month licensing-decision requirement is now law, and early achievements — such as the recent construction permit approval⁴⁰ for TerraPower's Natrium reactor — are encouraging, but until it is reliably and consistently achieved in practice, first-of-a-kind demonstrations will continue to face the schedule uncertainty that increases cost of capital and discourages investment. Timeline certainty is as important as timeline aspiration.

The Atomic Energy Act continues to require an uncontested "mandatory hearing" for all new reactor construction permits. INL's analysis of mandatory hearings from 2009 through 2023 found that they consistently add four to seven months to the critical path of licensing actions — time squarely on the critical path for every new reactor license. In that same period, not one mandatory hearing reached a different conclusion from the NRC Staff. The Efficient Nuclear Licensing Hearings Act (H.R. 6464, S. 4288), pending in both chambers, would eliminate this requirement. This committee should encourage its Senate partners on EPW to advance that legislation.

The NRC's ongoing rulemaking to establish a risk-informed, technology-inclusive framework (10 CFR Part 53) represents important progress, but implementing regulations for diverse advanced reactor designs — molten-salt, gas-cooled, sodium-cooled — remain incomplete. Each reactor type presents unique regulatory questions requiring NRC staff expertise, and the NRC faces workforce challenges including an aging staff with pending retirements and insufficient recruitment to review many simultaneous advanced-reactor applications. Appropriations to expand NRC's technical workforce are as important as regulatory reform.

DOE has taken an important step to streamline environmental review for advanced reactor projects through the establishment of a new categorical exclusion for the authorization, siting, construction, operation, reauthorization, and decommissioning of advanced nuclear reactors, published in the Federal Register on February 2, 2026.⁴¹ This committee should understand and help communicate that categorical exclusions are not exemptions from NEPA; they are a well-established, commonly used tool within the NEPA process that reduces documentation requirements and shortens review timelines for actions whose environmental impacts are well understood and consistently limited in scope. Categorical exclusions are used routinely across the federal government: the Federal Highway Administration relies on them for dozens of

⁴⁰ NRC Issues Construction Permit for TerraPower Natrium Reactor, March 4, 2026, <https://www.nrc.gov/sites/default/files/cdn/doc-collection-news/2026/26-028.pdf>

⁴¹ Learn more at <https://www.energy.gov/nepa/categorical-exclusion-advanced-nuclear-reactors>.

transportation project categories, the National Telecommunications and Information Administration recently adopted them for broadband infrastructure deployment, and DOE itself has established categorical exclusions covering energy storage and solar facilities. Section 109 of the Fiscal Responsibility Act of 2023 further allows agencies to adopt categorical exclusions established by other agencies, meaning the analytical groundwork done once can be applied efficiently across the federal enterprise. DOE, for example, formally adopted Forest Service categorical exclusions in July 2024 for activities relevant to transmission line maintenance.

All other environmental statutory obligations remain fully intact under a categorical exclusion; what changes is the documentation burden for actions that evidence has shown, repeatedly and consistently, do not produce significant environmental impacts. The NEPA reviews INL has conducted for MARVEL, Project Pele, and the TREAT reactor restart each reached that same conclusion: small or not-significant impacts across all resource categories. Establishing a categorical exclusion for advanced nuclear reactors codifies what the operational record already demonstrates, and this committee's support for its implementation will meaningfully accelerate the demonstration timelines the executive orders demand.

INL's *Recommendations to Improve Nuclear Licensing* also identifies several additional reforms worth this committee's attention: extending initial NRC commercial reactor license terms from 40 to 60 years to eliminate a pro forma license renewal process driven by economic rather than safety rationales; broadening DOE's authority to authorize activities by prime contractors away from government-owned sites; and reducing the Advisory Committee on Reactor Safeguards review burden by focusing ACRS reviews on unique or new safety issues with significant hazard potential rather than requiring comprehensive review of every new reactor application.

Scale, Manufacturing, and Workforce

Moving from demonstrations to deployment at the scale needed for 400 GW requires industrial transformation that cannot be achieved solely by removing regulatory barriers. The manufacturing, workforce, and supply-chain challenges are substantial.

Current manufacturing capacity for reactor components, particularly large forgings, specialized materials, and pressure vessels, is inadequate for the scale of deployment envisioned. Many critical capabilities were lost during the decades without new domestic builds as suppliers exited the nuclear market or shifted focus to international customers. Rebuilding this industrial base requires coordinated investment that only the federal government can catalyze.

The nuclear industry needs tens of thousands of workers, engineers, operators, health physicists, nuclear-grade welders, and craft workers, to build and operate new capacity at the scale envisioned. Current training pipelines are insufficient to meet this demand. INL is working extensively with universities and community colleges on workforce-development initiatives. Military-to-civilian transition programs leveraging Navy nuclear experience represent a particularly valuable and underutilized pipeline. But the scale of workforce need requires coordinated federal investment across the entire educational pipeline.

Transmission infrastructure will also require strategic investment. DOE's 2024 National Transmission Planning Study projects the United States must expand its transmission system by

2.1–2.6 times its 2020 size by 2050.⁴² Nuclear energy's 93% capacity factor as compared to 23% for solar and 34% for wind means that transmission infrastructure connected to nuclear plants achieves far higher utilization rates per mile built.⁴³ Nuclear's geographic flexibility also allows siting near existing infrastructure, potentially reducing new transmission requirements by up to 50% compared to scenarios dominated by variable renewables. These strategic advantages should inform how Congress shapes transmission policy.

This committee's support for coordinated federal investment in manufacturing capacity, workforce pipelines, and transmission infrastructure will be as important to achieving 400 GW as any regulatory reform.

Military Deployment: Resolving Statutory Ambiguity

The Army's Project Janus plans to deploy microreactors at nine bases by 2027–2028, representing a major commitment to nuclear power for defense energy security.⁴⁴ This program is encountering the same statutory ambiguities that affect commercial demonstration: military contracting mechanisms were not designed for purchasing nuclear power plants as long-term energy infrastructure. The question of acquisition authority for nuclear power plants on military installations remains unclear, as do facility siting criteria, security requirements, emergency planning, and fuel handling and waste management under DoD rather than NRC oversight.

The FY2026 NDAA's Sections 318 and 321 are meaningful steps. But congressional direction explicitly clarifying DoD's authority to procure and operate reactors for base power — not just naval propulsion, which has clear historical precedent — would accelerate military deployment. Military deployment can serve as a pathfinder for commercial applications, demonstrating reactor technologies in demanding operational environments while meeting critical defense energy-security needs. The lessons learned from military deployments in logistics, operations, maintenance, and workforce training will benefit subsequent commercial applications.

CLOSING: INL'S COMMITMENT AND THE PATH FORWARD

The consequences of success or failure in this nuclear moment extend far beyond electricity generation. Energy security is national security. Economic prosperity follows from reliable, abundant, affordable power. America's ability to lead in AI, advanced manufacturing, and space exploration depends on energy infrastructure that only nuclear can reliably provide at the required scale and quality. And the reactors America builds now will operate for 80 years or more, shaping energy security, economic prosperity, and global influence for the rest of the century.

⁴² U.S. DOE, *National Transmission Planning Study*. 2024. <https://www.energy.gov/gdo/national-transmission-planning-study>.

⁴³ U.S. Energy Information Administration, "Capacity factors for utility scale generators primarily using fossil fuels." 2023 data. https://www.eia.gov/electricity/monthly/epm_table_grapher.php?t=epmt_6_07_a.

⁴⁴ Army Communications and Outreach Office, "Army announces next steps on Janus Program for next-generation nuclear energy." November 18, 2025. https://www.army.mil/article/289074/army_announces_next_steps_on_janus_program_for_next_generation_nuclear_energy.

The technology exists. The market demand is real. The policy framework is being built. Private investment is mobilizing. What remains are the specific statutory decisions, particularly around DOE authorization, fuel cycle infrastructure, and the sustained investment in demonstration capabilities that determine whether we capitalize fully on this moment.

At INL, we are doing our part. DOME will be complete and ready for its first reactor this spring. MARVEL will achieve dry criticality this year. Launch Pad is welcoming its first developers. PROMETHEUS and VULCAN are underway. Our fuel cycle capabilities are supporting the Reactor Pilot Program and the Fuel Line Pilot Program simultaneously. And our workforce is embracing AI tools that are already measurably accelerating research timelines because we understand that achieving 400 GW by 2050 with traditional approaches alone is not possible.

The nuclear energy future we have long envisioned is no longer a distant aspiration. It is our immediate responsibility. As we celebrate America's 250th anniversary this year, the path to the next century of American energy leadership runs through the work happening in Idaho. INL rose to this moment once before when the nation called on the National Reactor Testing Station to build the foundation of the American nuclear industry. We are rising to it again.

I appreciate the opportunity to testify, and I want to thank the committee for its sustained attention to this critical issue. I look forward to your questions.

The CHAIRMAN. Thanks so much, Director Wagner.
We will hear now from you, Dr. Laufer.

**OPENING STATEMENT OF DR. MIKE LAUFER,
CO-FOUNDER AND CEO, KAIROS POWER**

Dr. LAUFER. Chairman Lee, Ranking Member Heinrich, and members of the Committee, thank you for the opportunity to testify and thank you for the bipartisan engagement and support of advanced nuclear energy.

My name is Mike Laufer. I am the CEO and co-founder of Kairos Power, an advanced nuclear engineering and manufacturing company headquartered in California, with manufacturing operations in New Mexico, and a reactor demonstration campus in Tennessee. Kairos is a Greek word meaning the right or opportune moment. That is where our nation stands today. The U.S. faces a pivotal moment as electricity demand surges due to AI, data centers, and reshored American manufacturing. The executive orders signal the urgency of the investments needed to meet this demand. As a nation, we must ensure that our energy supply is reliable, affordable, and secure. To meet these goals, it is vital that nuclear energy rise to meet its full potential.

Kairos Power grew out of a research effort led by the Department of Energy, universities, and national laboratories to establish the technical basis for commercially attractive reactors using molten-salt coolant. As the first advanced reactor mover with NRC construction permits, and the only nuclear facility under active NRC-regulated construction, we are happy to serve as the industry voice here today. In less than a decade, Kairos Power has matured to a company with more than 550 employees across multiple states, all singularly focused on bringing safe and affordable nuclear energy to the U.S. electricity market as quickly as possible. Our Fluoride Salt-Cooled High-Temperature Reactor (KP-FHR) pairs TRISO fuel with molten-salt coolant. This hyper design ensures robust inherent safety at low pressure, simplifying the footprint of safety-related systems and reducing capital costs. Building on the molten-salt pioneering legacy at Oak Ridge National Laboratory, with a focus on de-risking project delivery, we utilize an iterative design-build-test approach that mitigates the risks that have hindered many past nuclear builds.

We are validating our technology and delivery strategy through a series of non-nuclear engineering testing units that demonstrate our reactor systems at prototypic scale. In this effort, we are training our nuclear workforce with real experience running the largest molten-salt systems ever built and operated.

Our engineering test unit series is followed by our two demonstration reactors in Oak Ridge, Tennessee—HERMES, a low-power reactor now under construction, and HERMES 2, a 50-megawatt demonstration plant. Our goal is for HERMES 2 to be the first commercial-scale Gen IV reactor to supply power to the U.S. grid. Kairos Power has made significant investments in establishing in-house manufacturing, testing, construction, and other critical capabilities to accelerate this process. This approach continuously builds on the lessons from our non-nuclear test program and our demonstration reactors to enable fleet deployment for our

first customers, Google and the Tennessee Valley Authority. Our commercial agreement with Google is the first nuclear contract to include multiple advanced reactor deployments. HERMES 2 is the first reactor to be built under this agreement, and our contract with TVA is the first-ever nuclear power purchase agreement. Through the combination of a development approach and commercial agreements, we have established a credible pathway to establish cost certainty in our reactors, the proficiency and discipline to build and operate nuclear systems, and confidence in our ability to deliver future commercial plants on time and on budget, which this industry desperately needs.

Kairos Power is grateful and appreciates the support of the Department of Energy's Advanced Reactor Demonstration Program. To date, Kairos Power has received \$125 million from DOE under our novel milestone-based technology investment agreement. Modeled after the incredibly successful Commercial Orbital Transportation Services program from NASA, this agreement ties our federal funding to clearly defined, objectively verifiable milestones. This means that Kairos Power is only paid when we deliver results that matter. Use of this contract structure allows Kairos Power to remain agile while ensuring accountability and efficiency for DOE as it administers the strategic investment of taxpayer dollars. I would make the case that DOE's strategic investment in Kairos Power has provided the most value per taxpayer dollar to advance nuclear power in the U.S. based on the tangible progress we have made across technical, regulatory, construction, and commercial fronts over the past five years.

If I have the opportunity to deliver one message today, it is to urge this Committee to enable and encourage the expanded use of milestone-based strategic investments by DOE to support Kairos Power and others in the industry to meet the vital call to action that this moment demands. The message from Washington is unambiguous—nuclear energy is needed now. Soaring electricity demand, surging data center needs, and heightened concerns over cost, reliability, and energy independence create extraordinary opportunities. The executive orders and the continued bipartisan support from this Committee represent critical federal commitments that will shape America's energy future for decades to come. Kairos Power is proud to be building that future today with you. I want to thank the Committee for holding this hearing and for your continued commitment to enabling the expansion of American nuclear energy. I look forward to your questions and to working together on this mission.

[The prepared statement of Dr. Laufer follows:]



Testimony for the Record
Dr. Michael Laufer, Chief Executive Officer, Kairos Power, LLC

Before the United States Senate Committee on Energy and Natural Resources
Full Committee Hearing to Examine the Department of Energy's Implementation of
President Trump's May 2025 Nuclear Energy Executive Orders
March 19, 2026

Introduction:

Chairman Lee, Ranking Member Heinrich and distinguished Members of the Committee:

Thank you for the invitation and opportunity to appear before this Committee today. My name is Mike Laufer, I am the CEO and co-founder of Kairos Power an advanced nuclear design, engineering, and manufacturing company headquartered in Alameda, California, with manufacturing operations in Albuquerque, New Mexico, and our first demonstration reactor, Hermes, under active nuclear construction in Oak Ridge, Tennessee. I am grateful for this Committee's longstanding commitment to advancing the nuclear energy industry and support for policies that enable innovation, demonstration, and deployment to meet our growing energy demands. I would like to give a special acknowledgement to Senator Heinrich and his office, who have been steadfast supporters of Kairos Power throughout the years and have helped champion our technology.

I welcome the opportunity to offer Kairos Power's unique industry perspective, highlighting the critical role this technology must play in securing our nation's energy future, and sharing our experience moving from advanced reactor concept to active nuclear construction.

"Kairos" is a Greek term meaning the "right or opportune moment", which is where our nation stands today. The need for new power generation is at an all-time high, with projections such as ICF International's *Rising current: America's growing electricity demand* report indicating that electricity demand will rise by as much as 78% in 2050, driven by the electrification of transportation, the rapid expansion of artificial intelligence and data centers, and the reshoring of American manufacturing (Batra et al., 2025). At the same time, we face the challenge of ensuring our grid remains reliable, resilient, and cost-effective. This is our opportune moment, the Kairos moment, for nuclear energy to rise to its full potential to help meet growing demand, maintain grid reliability, ensure energy independence, and strengthen national and economic security. To meet our growing demand, strategic government investments that align with private industry will accelerate our ability to go from demonstration to deployment. This approach will allow government to fully leverage the private sector, by thinking like an investor. Similar to the position the National Aeronautics and Space Administration (NASA) implemented in the Commercial Orbital Transportation Services (COTS) program, it supports companies in development by investing in the outcome rather than the product.

Kairos Power is utilizing the government-provided strategic investment opportunities to deploy



and build out in-house manufacturing and to construct our demonstration reactor within the United States. We are driving towards aligning with the government's strategic investment goals.

Kairos Power's Origins

Kairos Power grew from a broad research effort originating in universities and national laboratories aimed at advancing the technical foundation for designing, developing, and licensing commercially attractive molten salt reactors. In January 2012, the Department of Energy (DOE) launched an Integrated Research Project with the Massachusetts Institute of Technology, the University of California at Berkeley, and the University of Wisconsin at Madison to develop this technical basis. Through this endeavor, Kairos Power was born.

We founded the company in 2016 with a single mission: to enable the world's transition to clean energy while improving people's quality of life and protecting the environment. To fulfill that mission, we are committed to delivering technology that is both safe and cost-effective. Since our founding, we have grown from three engineers to more than 550 full-time employees operating across multiple states, all in pursuit of bringing commercial advanced nuclear reactors to market and deploying them at scale.

Kairos Power Technology

Our technology, the Kairos Power Fluoride Salt-Cooled High-temperature Reactor (KP-FHR), is a high-temperature reactor utilizing molten fluoride salt coolant operating at near-atmospheric pressure. Its passively safe design offers increased safety margins compared to conventional nuclear plants, which are already among the safest energy systems in the world.

The molten salt reactor concept originated at Oak Ridge National Laboratory in Tennessee where researchers were among the first in the world to build and operate a molten salt test reactor. The Molten-Salt Reactor Experiment (MSRE) ran successfully for five years. The technology was eventually set aside in favor of light-water reactor designs that were more advanced at the time; however, its foundational science endured. Kairos Power is building upon that legacy in Oak Ridge through our Hermes Demonstration Reactor, incorporating and advancing the lessons learned from the MSRE program.

Kairos Power reactors use TRISO (Tri-structural Isotropic) particle fuel made with High-Assay Low-Enriched Uranium (HALEU), originally developed by DOE for high-temperature gas-cooled reactors. TRISO fuel has a durable, multi-layered ceramic shell that retains radioactive fission byproducts, serving as the reactor's primary containment. It withstands temperatures up to 1,600°C and has been called "the most robust nuclear fuel on Earth" by DOE.

The reactor coolant is Flibe, a chemically stable mixture of Lithium-Fluoride and Beryllium-Fluoride salts with a strong natural affinity for radioisotopes. The coolant serves as a secondary layer of containment in the highly unlikely event that fission products escape the fuel. To make Flibe, we require Lithium enriched to greater than 99.99% in the Lithium-7 isotope. This requirement has significant implications for domestic supply chain security, which I will address later in my remarks.



Like other Generation IV reactors, the KP-FHR also incorporates inherent safety features that support passive decay-heat removal without requiring electrical power or operator intervention in the event of an emergency. This combination of extremely high-temperature-tolerant fuel, low-pressure, and chemically stable coolant eliminates entire classes of potential fuel-damage scenarios, reducing the number of required safety systems and greatly simplifying the reactor's design. The intrinsic low pressure of the reactor and its associated piping, combined with the containment function of the TRISO fuel, enhances safety and eliminates the need for high-pressure containment structures. This is how the KP-FHR delivers increased safety margins at lower capital costs than conventional light-water reactors.

Kairos Power's Development Approach

Kairos Power's unique approach to commercialization is what truly distinguishes our company in the field of advanced nuclear energy. The conventional nuclear development model is long, slow, and capital-intensive. At Kairos Power, we are disrupting that model by embracing a rapid iterative approach that accelerates innovation and optimization.

Our commercialization pathway is focused on de-risking key aspects of nuclear project delivery, using an iterative design-build-test approach to accelerate learning and mitigate uncertainty before building our first commercial plant. We are validating our technology through a series of non-nuclear Engineering Test Units (ETU) that test the design and integration of reactor systems, demonstrate plant equipment modularization, establish manufacturing infrastructure, build sustainable supply chains, de-risk aspects of civil construction, and provide operational experience with large-scale molten salt systems.

To accelerate this process, Kairos Power has made significant investments in establishing in-house manufacturing, construction, and critical production capabilities to achieve greater control over quality, costs, and schedule. This vertical integration strategy mitigates supply chain risk by relying primarily on raw materials and off-the-shelf components, and leveraging in-house capabilities to produce specialized parts, fuel, and molten salt coolant. At our Manufacturing Development Campus in Albuquerque, New Mexico, our team is machining components from stainless steel and graphite, producing American Society of Mechanical Engineers (ASME) U-stamped pressure vessels, fabricating modular reactor equipment skids, and demonstrating processes for mass-producing TRISO particles and graphite fuel pebbles.

We built our first Engineering Test Unit (ETU 1) at our Albuquerque facility in 2023. It was the world's largest Flibe system, completing more than 2,000 hours of pumped salt operations and testing key systems, including salt loading, reactivity control, pebble handling, and chemistry control. ETU 1 generated hundreds of lessons that are helping to optimize systems in the next iteration. It also illuminated supply chain challenges that have directly influenced our vertical integration strategy, including the decisions to bring graphite machining and vessel manufacturing in-house. ETU 1 was deactivated and decommissioned in 2024.



Engineering Test Units 2 (ETU 2) and 3 (ETU 3) are currently under construction. With ETU 2 in Albuquerque, we are piloting modular reactor construction, packaging systems into over 30 modular equipment skids that are built in a quality-controlled factory environment and then assembled like building blocks. ETU 2 is essentially a non-nuclear template for the Hermes reactor, with skids designed to be transportable by truck or rail. ETU 2 also features the first U-stamped reactor vessel fabricated at our in-house vessel shop.

ETU 3 is under construction in Oak Ridge. Unlike ETU 2, the third iteration will not contain molten salt coolant. Instead, its mission is to demonstrate robotic remote-handling capabilities that will be essential to the operation and maintenance of our commercial fleet, enhancing worker safety and increasing reactor uptime. ETU 3 has already yielded valuable lessons in manufacturing and construction. ETU 3 has been an opportunity for Kairos Power to test electron beam welding – an advanced manufacturing technique with the potential to dramatically reduce the time involved in fabricating high-quality reactor vessels. The building that houses ETU 3 has served as a test bed for installing drilled piers, allowing us to fine-tune our construction process and quality assurance checklists before replicating them 100 yards away for the Hermes reactor building foundation.

Kairos Power’s Demonstration Phase: A Series of Firsts

In 2024, Kairos Power broke ground on the Hermes Low-Power Demonstration Reactor in Oak Ridge, Tennessee. It was the first Generation IV reactor to be approved for construction by the U.S. Nuclear Regulatory Commission (NRC), and the first non-light-water reactor to receive a construction permit in the United States in over 50 years.

This permit was the result of years of rigorous engagement with the NRC beginning in 2018. Kairos Power conducted extensive pre-application engagement with the agency, submitting 15 topical reports, 14 of which have been approved (1 is still under review). These topical reports formalize our approach to key regulatory and safety topics and provide a mechanism for securing NRC alignment on critical issues prior to formal license application submissions. This early and thorough pre-application engagement enabled an accelerated review timeline of just over two years for the Hermes Construction Permit Application, a process that has historically taken far longer.

In November 2024, the NRC approved the construction permit for Hermes 2, an electricity-producing demonstration plant that will be Kairos Power’s first plant to supply power to the U.S. grid. Notably, the NRC completed its review of the Hermes 2 application in just over one year — four months ahead of schedule. This efficiency was enabled by the iterative licensing precedents established through Hermes 1.

In May 2025, Kairos Power completed its first installation of nuclear safety-related concrete for the Hermes Low-Power Demonstration Reactor, marking the official start of nuclear construction on our Oak Ridge project. Since then, our crew successfully installed 52 drilled piers extending 40 feet below grade to anchor the reactor building to bedrock and is now starting on the mat slab that will support the seismic isolation system, further stabilizing the structure. These activities are ongoing today, representing one of the only active advanced nuclear reactor construction



projects in the United States.

In support of our milestones, Kairos Power engages with the various national laboratories to accelerate innovation and conduct meaningful research and development that is utilized in our technology. We are working with Los Alamos National Laboratory to produce TRISO pebbles for our Hermes Low-Power Demonstration Reactor at the Low-Enriched Fuel Fabrication Facility. This partnership reflects the government's strategic investments towards strengthening the domestic nuclear fuel cycle.

In support of our milestones, Kairos Power engages with the various national laboratories to accelerate innovation and conduct meaningful research and development that is utilized in our technology. We are working with Los Alamos National Laboratory to produce TRISO pebbles for our Hermes Low-Power Demonstration Reactor at the Low-Enriched Fuel Fabrication Facility. This partnership reflects the government's strategic investments towards strengthening the domestic nuclear fuel cycle.

Kairos Power also partners with DOE's Manufacturing Demonstration Facility at Oak Ridge National Laboratory to demonstrate advanced manufacturing and construction methods that will create and resore American manufacturing capabilities. At our Oak Ridge site, we are showcasing the innovative use of 3D-printed polymer composite forms to cast modular concrete shielding structures with complex geometries. The technique allows us to produce shapes that would not be possible with wood or steel forms, achieve the tight tolerances required for nuclear systems, and drive down costs and schedules as we scale up the construction technique for our future commercial fleet.

Kairos Power's Deployment Strategy: A New Model for American Nuclear Energy

In August 2024, Kairos Power announced a landmark tri-party collaboration with the Tennessee Valley Authority (TVA) and Google to address the surging demand for energy while advancing America's leadership in both advanced nuclear and digital technologies. Through a Power Purchase Agreement (PPA) between Kairos Power and TVA, the Hermes 2 Demonstration Plant will deliver up to 50 MW of reliable, clean energy to the TVA grid, which powers Google data centers in Tennessee and Alabama.

This is the first PPA in which a U.S. utility has agreed to purchase electricity from an advanced Generation IV reactor, and the first deployment under Kairos Power's landmark deal with Google to build up to 500 MW of new nuclear generation by 2035. In this initial phase, Google will procure clean energy attributes through the TVA system to support decarbonization of its data center operations in Montgomery County, Tennessee, and Jackson County, Alabama, while supporting future regional growth.

Lessons learned from Hermes 2 will optimize KP-FHR technology, enable subsequent commercial deployments for Google, and help drive down costs for future reactors and customers. This partnership represents an innovative model for how industrial energy users can meet their growing needs responsibly while driving local economic growth and opportunity. The tri-party structure protects electricity customers by limiting development costs to early movers



while helping bring costs down for future customers as additional units are deployed.

Building a Domestic Critical Minerals Supply Chain: Lithium-7 and Flibe

Critical minerals are fundamental to America's energy independence and national security, and nowhere is this more apparent than in the nuclear sector. In 2023, DOE added lithium to its Critical Materials List, recognizing its importance across energy technologies. This designation has been reinforced by Executive Orders 14154 and 14272, which together direct the elimination of regulatory barriers to domestic mineral production and mandate a national security investigation into America's dependence on foreign-processed critical minerals. These orders have direct implications for nuclear energy: China currently controls a dominant share of global lithium refining capacity and has demonstrated a willingness to use mineral supply chains as geopolitical leverage. Achieving the nation's goal of 400 gigawatts of new nuclear capacity by 2050 will require securing a resilient, domestic supply of these materials — and Kairos Power is building that supply chain today.

As described above, Kairos Power reactors require Flibe enriched in lithium-7 to greater than 99.99% purity. The challenge is significant: no domestic supplier currently produces lithium-7 at the volumes required for commercial nuclear deployment, historical U.S. stockpiles are projected to be exhausted in the early 2030s, and the remaining supply can only be imported from Russia. Kairos Power has spent several years developing an environmentally responsible, proprietary chemical process to isolate lithium-7, advancing the technology from bench-scale R&D. Starting in 2019, Kairos completed a series of pilot-scale demonstrations that established the foundation for commercial scale-up.

In 2024, Kairos Power broke ground on our Salt Production Facility (SPF) in Albuquerque, New Mexico, which will produce high-purity Flibe coolant for our advanced reactors, starting with the Hermes series. Demand for enriched lithium extends well beyond Kairos Power's own reactors. Pressurized water reactors across the existing U.S. fleet use enriched lithium hydroxide to control coolant pH and reduce corrosion, with the World Nuclear Association estimating domestic demand at approximately 400 kilograms annually. As molten salt reactors scale to commercial deployment, demand is expected to grow to tens of tonnes or more of pure lithium-7 ("Current", 2024). Our Salt Production Facility will have enough capacity to potentially supply enriched lithium to the entire U.S. nuclear industry, making it not merely a Kairos Power asset, but a critical piece of national energy infrastructure.

Aligning with Strategic Government Incentives: The ARDP and Milestone-Based Contracting

In December 2020, under the first Trump Administration, Kairos Power was selected by the DOE to receive funding through the Advanced Reactor Demonstration Program (ARDP) Risk Reduction tier to support the design, construction, and commissioning of the Hermes demonstration reactor. Upon being selected, our team recognized that the structure of the agreement would be as important as the funding itself. We needed a framework that would allow us to move with speed and flexibility, while deploying our resources with maximum effectiveness. We strongly believed that a milestone-based contract, a model previously utilized



by the Department of War and by NASA's COTS program, was the only approach capable of achieving that balance. Milestone-based contracting further supports a good of governance mindset, since private companies are responsible for up-front costs and potential delays, this approach further places government into the role of an investor seeking results not work. After negotiation with DOE, we executed a fixed-support Technology Investment Agreement in February 2024 that provides \$303 million in milestone payments – the first milestone-based contract of its kind under DOE.

This novel approach rewards progress by releasing fixed payments to Kairos Power only upon demonstrated achievement of predetermined, significant project milestones. The principle is straightforward: we are only paid when we deliver. DOE funds results, not work. Since being selected for the ARDP award, Kairos Power has made steady and measurable progress along our pathway to demonstration. Among the major milestones achieved to date are financial milestones, the successful commissioning and decommissioning of our Engineering Test Unit 1, the acquisition of the Hermes site, and our NRC milestones for fuel and material qualification plans as well as the issuance of our construction permits.

We believe milestone-based contracting should become the standard for strategic government incentive programs seeking to bring innovative technologies to commercialization. This model reduces administrative burden for both the recipient and the government, and establishes a fiscally responsible, transparent mechanism for distributing federal funds. It requires companies to carry real skin in the game, bearing the upfront capital risk necessary to achieve each milestone before any federal payment is triggered. That structure incentivizes efficiency, drives performance, and establishes the credibility to deliver. It is a model that serves the American taxpayer, as well as the companies and technologies it is designed to advance.

Advancing Advanced Nuclear: Policy Recommendations

The progress Kairos Power has achieved to date is the result of bold private investment, alignment with strategic government incentives, and a regulatory environment that has been evolving in the right direction. To fully realize the potential of advanced nuclear energy for America's energy leadership, we urge the Committee to consider the following priorities:

- Sustain and expand the Advanced Reactor Demonstration Program (ARDP): The ARDP funding model, which provided Kairos Power with critical early-stage support under the first Trump Administration, has proven its value. Continued investment in this program will de-risk next-generation technologies and accelerate the transition from demonstration to commercial deployment.
- Champion milestone-based contracting as the standard for government investment into the development of capabilities and outcomes: In February 2024, Kairos Power finalized the first milestone-based contract under DOE, a Technology Investment Agreement worth up to \$303 million. The milestone approach pays recipients only upon achievement of predetermined, significant project milestones, ensuring that government funds flow only for results, not work. It requires companies to have real skin in the game, reduces administrative burden for both parties, and drives efficiency and accountability. We



strongly encourage this model to become the standard for federal energy innovation programs.

- Pursue an all-of-government approach to energy innovation: While DOE has been the primary federal partner for advanced nuclear development, there are significant opportunities to leverage other agencies, including the Department of Commerce, the Department of War, and the Export-Import Bank, to accelerate commercialization, support domestic manufacturing, and expand American nuclear exports globally. Furthermore, there is continued opportunity to fully leverage R&D tax incentives as well as expanding the investment and production credits.
- Secure domestic supply chains for critical nuclear materials: HALEU and enriched lithium-7 are both essential to the advanced nuclear sector and both face acute supply chain vulnerabilities. The United States lacks a commercial-scale supply of HALEU therefore continued federal support is needed for the development of domestic enrichment to ensure a reliable fuel supply for advanced reactors and reduce reliance on foreign sources. Similarly, there is no domestic lithium-7 enrichment capacity; existing stockpiles will be exhausted in the early 2030s, and current imports depend on Russia. As a matter of national energy security, Congress and the Administration should prioritize investment in domestic enrichment and processing infrastructure such as Kairos Power's Salt Production Facility.

Closing

The United States is at a pivotal moment in its energy history. The convergence of soaring electricity demand, heightened concerns over cost and reliability, and the urgent need for clean baseload power to support U.S. energy security creates an extraordinary opportunity – and obligation – for advanced nuclear energy. Kairos Power is proud to be building that future, right now, in Oak Ridge, Tennessee, and at our sites around the country.

The progress we have made – from concept to construction in under a decade – demonstrates what is possible when innovative private companies, visionary government partners, and world-class national laboratories work together toward a shared mission. We are grateful for this Committee's leadership, its continued commitment to enabling American nuclear energy, and the critical role it has played in creating the policy environment that makes our work possible.

I look forward to continuing to work with this Committee to advance the policies and investments that will ensure American energy leadership for generations to come.



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The CHAIRMAN. Thank you very much. That concludes our opening statements. We will now turn to five-minute rounds of questions. I will go first, followed by Ranking Member Heinrich, then we will alternate between Republicans and Democrats in order of seniority, subject to the early-bird rule.

Mr. Garrish, I would like to start with you, if that's all right. President Trump's executive orders called for advanced reactor deployments and set forth these aggressive timelines. We have had some discussion of those today already, including this July 4th target date, trying, by our 250th birthday as a country, to achieve criticality in at least three test reactors under DOE authorization. I am encouraged that the Department of Energy is making full use of its existing authorities, and as I understand it, several companies are making progress under the DOE Reactor and Fuel Line Pilot Programs.

So, a couple of questions on this note: first, can you provide an update on the progress of these pilot programs and whether, to what extent, you remain on track to achieve that July 4th milestone? And second, how is the Department coordinating with the Nuclear Regulatory Commission to make sure that there is a transition pathway toward expedited commercial licensing?

Mr. GARRISH. Generally speaking, let me first say that for four of the reactors, we do have our preliminary safety analysis completed and we are proceeding now to the authorization stage where we will actually determine that they are safe to begin the process and actually turn on the reactors. And that is proceeding now. So, I am hopeful that we should be able to be successful on meeting the July 4th deadline. There could be some issues that come up on a couple of the reactors. We have questions on fuel fabrication and we are working our way through those. And it's a matter of just ordinary manufacturing issues. There is nothing extraordinary about the problems. It's just, we are problem solvers and we are trying to get through the issues to make this work.

In terms of advanced reactors just in general, the one thing that has happened is that Congress has appropriated substantial funds for the Advanced Reactor Demonstration Program. And that is proceeding well, and we have gone through some of the first tranches of funding for both TerraPower and for X-energy. The thing that is very rewarding, I think, is to see TerraPower getting its construction license to be able to proceed in a very short period of time—18 months. So, we are making progress.

You asked also about a relationship with the NRC. We are operating on our separate paths. We have our own system and they have their own system. However, what they are doing is joining us in the process as observers, and when the company expects to go commercial, they will have conversations with them as to the licensing process at the Nuclear Regulatory Commission. There have been a lot of questions about the cooperativity and whether or not we are separate enough. The Nuclear Regulatory Commission issued a memorandum of guidance, which I brought today, and I would be happy to offer it for the record, that really lays out the very different methodologies and how the two work together. In other words, one of the things that the NRC will do is, they will be observers in our process. What I have urged our people, and we

are doing at the lab is, when the NRC has additional information that they think is useful, I am urging us to provide that information to them in the process. So, this has been a fairly successful program back and forth between the two agencies. There are approximately 12 people from the Nuclear Regulatory Commission that have been assigned now in detail to us to work under our program.

The CHAIRMAN. Thank you. I appreciate that, and we will receive that, and without objection that will be admitted into the record.
[The document referred to follows:]

ADDENDUM NO. 9 TO THE
MEMORANDUM OF UNDERSTANDING
BETWEEN U.S. DEPARTMENT OF ENERGY
AND
U.S. NUCLEAR REGULATORY COMMISSION ON
NUCLEAR ENERGY INNOVATION
FOR
COORDINATING DOE AND NRC TECHNICAL EXPERTISE AND KNOWLEDGE ON ADVANCED
NUCLEAR REACTOR AND ADVANCED REACTOR FUEL TECHNOLOGIES

I. PURPOSE

The purpose of the October 7, 2019, Memorandum of Understanding (MOU) between the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) on Nuclear Energy Innovation is to coordinate DOE and NRC technical readiness and sharing of technical expertise and knowledge on advanced nuclear reactor technologies and nuclear energy innovation, including reactor concepts demonstrations.

This addendum to the MOU between the NRC and DOE (hereafter the "parties" or "party"), describes the roles, responsibilities, and processes for their coordination of activities to implement Executive Order (E.O.) 14301, *Reforming Nuclear Reactor Testing at the Department of Energy*, E.O. 14302, *Reinvigorating the Nuclear Industrial Base*, E.O. 14299, *Deploying Advanced Nuclear Reactor Technologies for National Security*, and E.O. 14300, *Ordering the Reform of the Nuclear Regulatory Commission*. The primary purpose of this addendum to the MOU is to coordinate DOE and NRC technical readiness and sharing of technical expertise and knowledge on advanced nuclear reactor and advanced reactor fuel technologies and to ensure that DOE-NE authorized reactors, fuel lines, and other nuclear facilities are designed, constructed, and operated in a manner that provides reasonable assurance of adequate protection to workers, public, and the environment. A secondary purpose of the MOU is to enable documented safety analyses (DSAs) for DOE-NE authorized nuclear facilities that have been tested and that have demonstrated the ability to function safely to be leveraged to streamline and expedite future NRC licensing activities pursuant to E.O. 14300, *Ordering the Reform of the Nuclear Regulatory Commission*.

II. AUTHORITY

The DOE entered into this MOU under the authority of Section 646 of the Department of Energy Organization Act (Public Law 95-91, as amended; 42 U.S.C. 7256) and Section 205 of the Energy Reorganization Act of 1974 (Public Law 93-438, as amended; 42 U.S.C. 5845). The NRC entered into this MOU under the authority of Section 205 of the Energy Reorganization Act of 1974 (Public Law 93-438, as amended; 42 U.S.C. 5845), and Section 958 of the Energy Policy Act of 2005, as amended by the Nuclear Energy Innovation Capabilities Act of 2017.

This addendum to the MOU does not alter the authority or independence of the parties or their abilities to fulfill their respective responsibilities.

III. ROLES AND RESPONSIBILITIES OF EACH PARTY

A. DOE

1. DOE is responsible for carrying out the Reactor and Fuel Line Pilot Programs, which are programs aimed at reforming reactor testing at the Department. The goal of the Reactor Pilot Program is to expedite the testing of advanced reactor designs that will be authorized by DOE. The goal of the Fuel Line Pilot Program is to advance research and development and strengthen the domestic supply chains for nuclear fuel in support of the Reactor Pilot Program.
2. In carrying out the Reactor and Fuel Line Pilot Programs, DOE is responsible for, among other things, leveraging the technical expertise of relevant Federal agencies and the National Laboratories, as appropriate, in order to minimize the time required to enable construction and operation of privately funded advanced reactors under the Department's jurisdiction.
3. As appropriate, DOE will assist selected advanced reactor companies in understanding and navigating the pertinent regulatory processes.
4. **Authorization of DOE-NE Reactor and Non-Reactor Nuclear Facilities:**
 - DOE is responsible for reviewing and approving DSAs and authorizing activities for nuclear facilities in accordance with 10 CFR 830, Subpart B.
 - DOE is responsible for maintaining the safety analysis technical capability to perform safety reviews.
5. **Provision of Technical Information:** DOE will provide all necessary technical information and documentation to facilitate the review process. DOE will also share all necessary information and documentation with NRC to facilitate the NRC's ability to leverage such information in future licensing reviews.
6. **DSA Review Coordination with NRC:**
 - DOE will develop the review plan and is responsible for execution of the review with available resources, including any NRC staff that are detailed to DOE for purposes of the review.
 - DOE will coordinate with NRC to schedule reviews to facilitate availability of technical resources to support DOE's review, and to facilitate NRC observation of DOE reviews for the purpose of developing an expedited pathway for NRC licensing as described in Section C below.
 - DOE will address any issues or concerns that arise during the review process.
7. **Training Staff:** DOE will train staff detailed to DOE in DOE review methods to ensure consistency and understanding with the conduct of DOE reviews.

8. **Providing Feedback:** DOE will provide feedback to NRC on the performance of NRC staff detailed to DOE.

9. **NRC Observation of DOE Reviews:** On a not-to-interfere basis, DOE will provide NRC technical staff with access and the opportunity to observe and learn about the DOE authorization process as well as the technologies authorized by DOE to facilitate the NRC's ability to leverage such information in future licensing reviews as described in Section C. Observation of DOE reviews is solely intended for NRC staff to familiarize itself with DOE review process so that information can be effectively leveraged in future NRC licensing activities, and to support identification of areas of NRC reviews that may not be covered.

B. NRC

1. The NRC is responsible for licensing new or advanced nuclear technology subject to its jurisdiction, including demonstration reactors for the purpose of demonstrating commercial application of the reactor.

2. The NRC, consistent with its role as a safety and security regulator, is responsible for providing DOE and the nuclear energy community with accurate, current information on the NRC's regulations and licensing processes.

3. **Supporting Authorization Reviews:** NRC will support DOE-NE by identifying available NRC personnel that could be detailed to DOE to support DOE in their review of both reactor and non-reactor facilities authorized by DOE-NE. Consistent with Section V. of this addendum to the MOU, DOE and NRC may, as needed and by mutual agreement, enter into Implementing Interagency Agreements (IAAs), supplemental to this addendum to the MOU, that address project-specific items in accordance with this addendum to the MOU. Such IAAs may be executed between DOE at the Deputy Assistant Secretary level and NRC at the Office Director level.

4. **Resolution of Technical Concerns:** If technical concerns cannot be resolved during the review, NRC reviewers will follow DOE's Idaho Management System (IDMS) Office Procedure (OP) 01.OP.13, *Resolution of ES&H Technical Concerns*, for addressing differing professional opinions.

5. **Providing Feedback:** NRC reviewers detailed to DOE pursuant to an IAA may provide feedback on the review process to DOE Point of Contact to improve quality and efficiency in the review process.

IV. COORDINATED ACTIVITIES OF THE PARTIES

In addition to the areas of technical expertise and knowledge to be shared pursuant to subsection I.A. above, DOE and NRC will undertake activities, including those identified below, regarding technical expertise, computing, and facility capabilities related to DOE's role in research and development for advanced nuclear reactor and reactor fuel technology, and the NRC's role as an independent safety regulator, in the review of applications for advanced reactors.

A. SHARING INFORMATION

1. **Data Exchange:** DOE and NRC will facilitate the exchange of relevant data and

technical information to support DOE's review process, as well as NRC's leveraging of pertinent information in future NRC licensing processes.

2. **Confidentiality:** Both parties will ensure that any proprietary or sensitive information shared during the review process is protected and handled in accordance with applicable laws and regulations.
3. **Novel Data:** NRC and/or DOE may need to grant the other party access to novel data, technical, financial or otherwise, generated during the course of the project. DOE and/or NRC may utilize such data to support its efforts for future research reactor authorization and safety case justifications. This data may include, but are not limited to, data associated with authorization of reactors and fuel line projects as well as particular operational data. However, if any requested data are technical, commercial, or financial data first produced in the performance of the agreement which, if it had been obtained from and first produced by a non-federal party, would be considered a trade secret or commercial or financial information that is privileged or confidential under the meaning of 5 U.S.C. § 552(b)(4), pursuant to special OT statutory authority, such data are eligible for protection from public disclosure for up to 30 years after the data are generated or first produced ("Protected Data"). Such Protected Data must be appropriately marked as protected data when delivered to DOE as outlined in the OTA terms.

B. SHARING TECHNICAL EXPERTISE

DOE and NRC will share technical expertise and knowledge as appropriate with respect to, but not limited to advanced reactors and nuclear fuel line facilities, to include the following areas:

1. DOE's testing and operations of advanced nuclear reactors to be proposed and funded by the private sector.
2. DOE's testing and operations of nuclear fuel line facilities to be proposed and funded by the private sector.
3. DOE's operation of an electronic system to store and share data and knowledge relevant to nuclear science and engineering with relevant Federal agencies (including the NRC) and the private sector, as appropriate.
4. DOE's development and testing of electric and nonelectric integration and energy conversion systems relevant to advanced reactors.
5. NRC's expertise with respect to safety analysis.
6. NRC technical staff will be provided access and the opportunity to observe and learn about technologies developed through DOE's advanced reactor programs. NRC observers are invited to observe DOE's established methods for conducting DSA and readiness reviews, along with advanced reactor technologies of which NRC may not be familiar, including any specific tests, processes to start up reactors, and other activities related to DOE's operating experience.

C. COORDINATED ACTIVITIES

In addition to the areas of technical expertise and knowledge to be shared pursuant to subsection A, above, DOE and NRC will undertake activities, including those identified

below, regarding the technical expertise, computing, and facility capabilities related to DOE's role in research and development for advanced reactor technology and the NRC's role, as a safety regulator, in the review of applications for advanced reactors and to ensure that:

- A. DOE has sufficient technical expertise to support the timely research, development, demonstration, and commercial application by the civilian nuclear industry of safe and innovative advanced reactor technology; and
- B. NRC has sufficient technical expertise to support the evaluation of applications for NRC licenses, permits, and design certifications and other requests for regulatory approval for advanced nuclear reactors and advanced nuclear reactor fuel.

DOE and NRC will coordinate as appropriate to ensure the following activities are fulfilled:

1. NRC establishes an expedited pathway to approve advanced reactor designs that have been authorized and tested by DOE and have demonstrated the ability to function safely that focuses on risks or safety issues identified during the NRC licensing review that may arise from, among other things, design changes in new applications to be licensed by the NRC, rather than revisiting risks that have already been addressed in the DOE review.
2. NRC establishes an expedited pathway to approve nuclear fuel line facilities that have been authorized and by DOE and have demonstrated the ability to function safely that focuses on risks or safety issues identified during the NRC licensing review that may arise from, among other things, design changes in new applications to be licenses by the NRC, rather than revisiting risks that have already been addressed in the DOE review.
3. DOE and the NRC share information, as appropriate, regarding the use of computers and software codes to calculate the behavior and performance of advanced nuclear reactors based on mathematical models of the physical behavior of advanced nuclear reactors.
4. DOE maintains and develops the facilities necessary to enable the timely research, development, demonstration, and commercial application by the civilian nuclear industry of safe and innovative reactor technology.
5. NRC has access to those DOE facilities described in paragraph IV.C.4, as needed and appropriate, and will complete any required training for access.

V. ORGANIZATIONAL IMPLEMENTATION

1. **Office.** This addendum to the MOU will be implemented through DOE-NE's Office of Nuclear Reactors on behalf of DOE and through NRC's Office of Nuclear Regulatory Regulation on behalf of NRC. These offices will coordinate the activities and sharing of technical expertise and knowledge covered by this addendum to the MOU.
2. **Contacts.** The point of contact for coordination and implementation of this addendum to the MOU for DOE will be the Assistant Secretary for Nuclear Energy, and for NRC will be the Director of the Office of Nuclear Regulatory Regulation. The Technical Point of Contact for the conduct of the review process will be the Manager for the Idaho Operations Office.

3. Implementing Interagency Agreements. DOE and NRC may, as needed and by mutual agreement, enter into Implementing Interagency Agreements (IAAs), supplemental to this addendum to the MOU, that address project-specific items in accordance with this addendum to the MOU. Such IAAs may be executed between DOE at the Deputy Assistant Secretary level and NRC at the Office Director level.

VI. FUNDING AND AUTHORIZATIONS

1. This addendum to the MOU does not alter the authorities or independence of the NRC and DOE or their abilities to fulfill their responsibilities.

2. This addendum to the MOU shall not under any circumstances restrict either of the parties from participating in any activity with other public or private agencies, organizations or individuals.

3. This addendum to the MOU is neither a fiscal nor a funds obligation document. Nothing in this MOU provides authorization or is intended to obligate the parties to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value, or enter into any contract, assistance agreement, interagency agreement or other financial obligation. Any activity under this addendum to the MOU is subject to the availability of funds.

4. This addendum to the MOU is strictly for internal management purposes for each of the parties. It is not legally enforceable and shall not be construed to create any legal obligation on the part of either party. This addendum to the MOU shall not be construed to provide a private right or cause of action for or by any person or entity.

5. All activities pursuant to this addendum to the MOU are subject to and will be carried out in compliance with all applicable laws, regulations and other legal requirements.

6. Each party is responsible for its own compliance with any applicable statutory or regulatory data protection, export control or security restriction regarding any information or materials resulting from this addendum to the MOU. DOE and the NRC will coordinate their efforts, as appropriate, to fulfill these responsibilities.

VII. COMMENCEMENT, MODIFICATION, AND TERMINATION

This addendum to the MOU is effective upon the signature of both parties. The duration of the addendum to the MOU shall be indefinite. Either party, however, may terminate its participation in this addendum to the MOU upon 30 days written notice to the other party, consistent with their responsibilities under applicable law. The DOE and NRC may, by mutual agreement, amend this addendum to the MOU.

VIII. SEVERABILITY

If any provision of this addendum to the MOU, or the application of any provision to any person or circumstances, is or becomes invalid, the remainder of this addendum to the MOU and the application of such provisions to other persons or circumstances shall not be affected.

IX. AGREEMENT

Rian Bahran, Deputy
Assistant Secretary
for Nuclear Reactors
Office of Nuclear Energy
U.S. Department of Energy

Gregory T. Bowman
Acting Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

10/24/25

Date

10/2/2025

Date

10/24/25

Effective Date

The CHAIRMAN. Dr. Wagner, can you elaborate a little bit on the recommendations that have been made in this area on why the current authorization framework falls short and why you believe Congress needs to clarify and expand the Department of Energy's authority in this area?

Dr. WAGNER. Yes, I would like to. So, first of all, I would like to be clear on something—the intent here of what I am suggesting the Congress consider is not to circumvent the Nuclear Regulatory Commission or to undermine its commercial licensing rule in any way. The NRC remains the right body for commercial reactor licensing, and nothing we are proposing changes that. So, I want to be real clear on that.

What we are asking is for some clarity around what we consider a statutory gap, particularly in Section 202 related to the definition and the carve-out of demonstration nuclear reactors. The details are in my written testimony. Because that language can be interpreted in different ways—it is being interpreted in different ways such that it could be interpreted that even private company reactors on a national laboratory would fall under NRC because it can be interpreted that any reactor is really being developed and demonstrated, ultimately, for commercial purposes. And that's what we do. So, clarifying that.

Separately, we are seeking the Committee to consider expanding that to be clear that if DOE is demonstrating a reactor for their mission space, and something unique related to that, like a first-of-kind, for example, demonstrating the pairing of a small nuclear reactor with a data center and demonstrating how to manage those loads, that that could be also considered under DOE authorization. There is also some ambiguity related to the Department of Defense authorities and applications that we would ask the Committee to take a look at.

And so, I understand there are a lot of details here that matter, but that's my short answer on that.

The CHAIRMAN. It turns out there are some details involved in nuclear energy and in the law related to it.

Ranking Member Heinrich.

Senator HEINRICH. Thanks, Chairman.

I want to start with you, Dr. Laufer. I want to ask you to sort of go a little deeper into the milestone-based cost approach that you outlined in terms of contracting and talk about how that helps you manage financial risk in these public-private partnerships and what value it might bring to other developers as well.

Dr. LAUFER. Yes, thank you, Senator.

So, the contract that Kairos has with DOE is part of our ARDP award, it is milestone-based, and it is a fixed-support milestone. So, there is a series of about 30 milestones in our contract. They have fixed payments. Kairos has to demonstrate that we have achieved those milestones, and it's actually a very straightforward process of submitting the invoice through the field office at INL for processing payment. So, from my perspective, it is a structure modeled off of the NASA COTS program that is very efficient, low overhead from the DOE perspective. It provides a lot of accountability. Those milestones are significant. So, things like the submission of an application at the NRC. We tried to remove subjectivity there. When we

install a test vessel for our testing, those are major milestones that are easy to verify. So, there is not a lot of subjectivity there.

What the milestones do is, they provide flexibility in how they are achieved. So, for example, we have several fuel milestones. To bring a reactor to critical, we have to deliver fuel to the site, and there are a few along way in terms of production. That's, you know, unquestionable in terms of the importance. The contract and the milestones are non-specific in how we reach that. And for Kairos, we do a lot of in-house manufacturing, so we were not sure at the start of the program whether we are going to be manufacturing fuel or procuring it. The milestones are agnostic to that. So, it provides flexibility. And in this case, we identified an opportunity, after we were selected for the award, to partner with Los Alamos National Laboratory to produce the fuel for HERMES. If we had to program that upfront in the award in a conventional contract, we wouldn't have had the flexibility. We would have had to pool money from other partners, other facilities to do that. So, it gives us a lot of flexibility, which is very valuable, and it removes a lot of the overhead burden from conventional contracts.

Senator HEINRICH. It has also resulted in just a much faster development cycle, correct?

Dr. LAUFER. Yes, well, it works with our cycle and allows us to be agile and change plans. And particularly, with the national laboratories, that agility has been valuable. So, with Oak Ridge, we have been able in the last year to rapidly expand our activities on the civil construction and manufacturing side, taking advantage of new progress in that area. Those were not even known possibilities a few years ago. And so, being able to have that flexibility, and actually because Kairos controls where we spend the money to achieve the milestones, it allows us the flexibility to make sure that we are using our investment efficiently to achieve those milestones.

Senator HEINRICH. Let me pivot to HALEU. How critical is the timely development of reliable domestic HALEU supply for, not just Kairos, but for the entire broader advanced reactor sector?

Dr. LAUFER. So, the development of the supply chain for the high-assay LEU is imperative for us and for others, though, I start from the position that the investments from commercial industry need to be driven by a viable future fleet of reactors. That order book needs to be the driver for all of that commercial investment. So, we are working hard to develop that demand signal, and then the support that DOE has provided for initial demonstration programs, so we have completed our contract with DOE for HALEU for the HERMES reactor. But for us, actually, our general strategy is to defer as long as possible to allow time for the enrichers to develop that infrastructure. But that clock is ticking and there is urgency for others, especially in terms of that need, but for us in general, having that partnership with DOE for the early demonstration projects is critical, and we are proud to have reached agreement with DOE on that front.

Senator HEINRICH. Mr. Garrish, last year's appropriation bill provided \$3.1 billion to support the Advanced Reactor Demonstration Program. Obviously, that is meant to catalyze private-sector invest-

ment in deploying next-generation nuclear technologies. What is the Department strategy to disburse this funding effectively?

Mr. GARRISH. As you know, Senator—thank you for the question—there was a short deadline for indicating back to the Congress as to what our plans were. We have internally gone through and determined what an appropriate allocation of that was, and the amount that we have determined that was available out of that \$3.1 was \$2.83 billion. And the reason for the difference was that some of that money was previously obligated and we are working that through. We have provided to the appropriators our suggested allocations, the way we would make that money available. We have gone back to OMB and provided that back to OMB for their review also. And they are in the process of allowing us to make those allocations known, and they will, in their allocation process, provide that money in some timely fashion, we believe, over the next several months.

The CHAIRMAN. Senator Cortez Masto.

Senator CORTEZ MASTO. Thank you.

Assistant Secretary Garrish, as you know, Section 3 of the executive order calling for Reinvigorating the Nuclear Industrial Base required DOE to coordinate on a recommended national policy to support the management of spent nuclear fuel and high-level waste. Can you please provide details on what recommendations were submitted to the White House regarding the management of spent fuel?

Mr. GARRISH. The report that went—we did make those reports to the White House, and in essence, it reflects the Nuclear Lifecycle Innovation Campuses. In other words, we have gone out to the public and to governors and to states and asked them their interest in being one of these campuses. And that was a very lengthy request for information. And in that, we asked them to commit to a number of items, and one of them would be the management of the disposition of spent fuel. And the idea in those campuses was, we wanted to get the value out of the spent fuel, and therefore, they would use a recycling process and have resale of the materials. So, the spent fuel stream would be greatly reduced from having to bury the spent fuel the way it was anticipated with Yucca Mountain.

Senator CORTEZ MASTO. Can I ask very quickly, because I only have so much time, were the campuses the only recommendation that came out of that report to the White House or were there other recommendations?

Mr. GARRISH. The industrialization and the recycling aspect was the manner in which that was the answer that was made to the White House.

Senator CORTEZ MASTO. Okay.

And then, with respect to the campuses, how is the Department informing, or, excuse me, how are these campuses informing the Department's next steps, or is it too soon to tell?

Mr. GARRISH. Well, we ask a number of questions to the states and the governors. They were to respond by April 1st. We anticipate using some criteria to move forward and determine which ones are viable. And then, based on that, we would probably go into some form of MOU with the states as a first step, moving to-

ward state legislation and federal legislation to actually make this a stable, long-term program.

Senator CORTEZ MASTO. Thank you.

And is it still the administration's posture in opposition to Yucca Mountain? That is still affirmingly the position of this administration and no funding is requested for Yucca Mountain?

Mr. GARRISH. The President's position has not changed.

Senator CORTEZ MASTO. Thank you.

Dr. Wagner, I noticed in your statement that you talked about the need to update the Nuclear Waste Policy Act. What did you mean by that?

Dr. WAGNER. So, thank you for the question, first of all.

So, as Assistant Secretary Garrish noted, the Nuclear Waste Policy Act was initially enacted in 1982.

Senator CORTEZ MASTO. I know it well.

Dr. WAGNER. A lot has changed, including this concept of Nuclear Lifecycle Innovation Campuses. And so, you know, I would say, I won't speak for the Department of Energy, but they re-looked at the entire strategy for the back end. This is reflected in the Nuclear Life Cycle Innovation Campuses. And that is not consistent with the way the Nuclear Waste Policy Act was structured. And one other key aspect of that is the way the Nuclear Waste Policy Act is structured, there really is no policy incentive for recycling, for example.

And so, that all needs to be looked at carefully. I would hope that the request for information responses from this activity the Department is doing would be useful information to inform how exactly the Nuclear Waste Policy Act should be modified. But I feel strongly that modifications are required. I think it's going to—we need to move quickly but we also need to be thoughtful in how this would be changed.

Senator CORTEZ MASTO. Do you think there are modifications that are available now because of emerging technology, or new technology that is available to us?

Dr. WAGNER. There are advancements in recycling technology, but a lot has changed as well in a sense of, you know, for the last several decades, we have been flat in nuclear energy, essentially, and now we are talking about quadrupling nuclear power by 2050. So, we also have a very different future in front of us that also was not, I would say, foreseen back in that time period.

Senator CORTEZ MASTO. And then, finally, to the two of you, do you see a distinction in how you are going to manage the waste from these advanced reactors versus the traditional technology for waste? And again, to me, they are two different issues. I understand with the advanced technology or advanced reactors it produces different waste stream considerations than the old technology, but I am curious how you—I do think, and many of my colleagues are concerned that we still have a waste issue in both of them. How do we manage that?

Either one of you, and maybe, Assistant Secretary, if you want to start?

Mr. GARRISH. Each of those technologies is different.

Senator CORTEZ MASTO. Right.

Mr. GARRISH. And the handling of TRISO fuel, for instance, must be done differently than traditional spent fuel. And we are in the process of analyzing how that is to be done, but each of those end products do have value, and we are attempting to make sure that we get the value from the products.

Senator CORTEZ MASTO. Yes, and I know my time is up. I can't stress this enough. This, to me, is the issue we deal with first, how we address the waste so we don't end up where we are today with an old policy from the 80s and we are still addressing the waste in this country. This is a priority for us to move forward with nuclear technology, and I am hopeful that there is a priority to address the waste stream on both technologies and give those answers to us here in Congress so we have a future for this country.

Mr. GARRISH. We understand, and we will necessarily have to come back to the Congress for legislation to do the modifications on the Nuclear Waste Policy Act consistent with the states that we deal with and how they would like to proceed.

Senator CORTEZ MASTO. Thank you. I know my time is up. Thank you.

The CHAIRMAN. Thank you, Senator Cortez Masto.

Senator Hyde-Smith, you are up next.

Senator HYDE-SMITH. Thank you, Mr. Chairman, and I certainly want to thank the members here for being here, that you are coming to help us out here with the witnesses.

The Trump administration has made it abundantly clear that nuclear power should be a highly considered source of baseload power. And Mississippi, the state I represent, is home to Grand Gulf Nuclear Station, the largest single-unit reactor in the entire country. The Nuclear Regulatory Commission is currently undertaking the process to renew an existing early site permit at Grand Gulf, which could make Grand Gulf an ideal location for a future advanced reactor. I continue to hear concerns about cost overrun risk being a factor outside the project's control, and these issues range from nuclear regulatory changes, to workforce, to supply chain constraints, to many things. In the decades since the United States became a leader in commercial nuclear energy, we have seen a reduction in nuclear manufacturing capabilities and secure nuclear supply chains.

To the panel, what are all your thoughts on how we can work to re-shore the nuclear supply chain in a way that would decrease the cost overruns and construction disruptions—issues that might deter utilities and developers from building new reactors in the United States?

Mr. GARRISH. The overrun question is one of the issues, one of the stumbling blocks going forward that we need to deal with. One of the issues that I think we have to do is, we have to incentivize on-budget, on-time activities from the industry that is building these reactors. Currently, there is very little incentive to reduce costs. And we have other programs at the Department, and let me give you an example, where we have had very costly overruns in terms of how much it costs to rehab a particular area. And the one that comes to mind is Rocky Flats in Colorado. At Rocky Flats in Colorado, we were able to reduce the ultimate cost of that activity through incentivizing the contractors to take the necessary actions

to be in on time and on budget. What we have got to do is do the same, I believe, with nuclear new build. It takes a while for the cost to be able—so we can have enough production that we can reduce costs and manufacturing, for instance. But I believe that we need to have a program that will incentivize keeping this on budget. And we are working diligently right now with the industry to see what methods can be undertaken.

There are pieces of legislation that are out now currently, before the Congress, on the question on overruns. And I understand one of the ways to deal with it is to spend more money. I am not necessarily convinced that we need to do that. I think what we need to do is provide the incentives to make this operation, make the incentives for staying on budget, not providing additional methodology for overruns.

Senator HYDE-SMITH. Thank you for that answer.

Dr. Wagner.

Dr. WAGNER. I would just add to that, you know, any first-of-a-kind technology is more expensive than the third, the fifth, the seventh, you know, to the so-called nth-of-a-kind cost that you run the curve down for any energy technology and pretty much any technology, period. And as you rightly framed in the question, we have atrophied in our supply chain and our ability to build these things, and our workforce, just about every aspect that we need, particularly for building large nuclear reactors. We saw that play out in the Vogtle experience, where the cost escalated from an initial estimate around \$14 billion to over \$30 billion. Each utility and each utility board does not want to have that situation play out in their system.

And so, we do have to find mechanisms like Assistant Secretary Garrish talked about in terms of how do we do it on budget, but we also know when you are doing first-of-kind, you run into first-of-kind issues that you didn't anticipate, and therefore, you may have cost overruns. So, I am not an expert on how to address that aspect, but I do know from talking to utility leaders and private company leaders that utility boards, public utility commissions would like some assurance, to the extent possible, that the rate-payers don't end up with a significant extra cost related to the first-of-a-kind build. And we can't get to nth-of-kind cost measures until we do the first one. And so, that is the situation we found ourselves in for quite a while.

Senator HYDE-SMITH. We don't know what we don't know. Thank you so much.

Sir.

Dr. LAUFER. So, if I may just briefly add, this is the fundamental issue for new deployment. And I would say that the path forward needs to have a bridge to that commercial viability that understands the risk of first-of-a-kind deployments. And I would say, through DOE's investments, has accountability for understanding where things may be going in the wrong direction and being able to have multiple options, multiple pathways, and make decisions because we need to have multiple strategies in place, but not everyone is going to ultimately be successful.

And so, being able to execute those first projects well and then translate that execution into predictable and repeatable costs for

future projects, that's the key. But reducing the capital investment for the early projects is fundamental there, and then being able to fully leverage DOE's strategic investments, but provide that accountability, and really only the projects that have that viability, that commercial viability to get to that private financing vehicle, that is where we need to get to because we need to kind of build that bridge across that divide. So, that is the key point.

Senator HYDE-SMITH. Thank you, and I know I am out of time. I have a second question that I will submit.

Thank you.

The CHAIRMAN. Thank you, Senator Hyde-Smith.

Senator Gallego.

Senator GALLEGRO. Thank you, Chairman Lee and Ranking Member Heinrich, and thank you to our witnesses for being here.

As many of you know, nuclear energy is important to me. Its potential for clean reliable energy is tremendous. Being from Arizona, I am very proud of Palo Verde Generating Station, one of the largest producers for 30 years. And Arizona State was selected by DOE last year as a research partner for the MARVEL program. I don't need to—you guys know what that is, we will skip that one to make sure you get to my questions. Recently, I was proud to introduce a bill called the ARC Act with Senator Risch to accelerate investment and completion of new commercial nuclear reactors by minimizing costs and overrun risks. We just had this conversation. I look forward to working on more bipartisan nuclear efforts that move technology forward without undermining community input and safety.

My first question is for Mr. Garrish. I appreciate your openness to creative solutions for the safe and fast deployment of nuclear energy, and during your confirmation process, I especially appreciated our conversation in my office around SMRs, which have great potential to meet rising energy demands, especially in places like Arizona. I have heard from communities that don't want to wait, and are looking for creative solutions, like partnering with military bases on advanced nuclear projects. The executive order on nuclear for national security includes a similar mandate to put a nuclear reactor on domestic military installations by 2028, and I share that desire also to move quickly and improve military readiness through nuclear energy, but I have some questions about the implementation of this executive order.

Given that the Department of the Army is working with the DOE to update your authorization process, how are you supporting the identification of reactor deployment sites, and what outreach or consultation is being done with surrounding communities that may be interested or may not be interested?

Mr. GARRISH. The Department of the Army has the Janus Program that you are familiar with, which is really their entire program to basically establish nuclear as a source of electricity for military bases. We are cooperating with them, and right now, in the case of one of the micros, they are working with us so that we can authorize it, and potentially they would authorize it following our initial activity. We generally provide, through Dr. Wagner's people at the laboratory—our folks and the laboratory people provide most of the expertise that is needed for the Army to do the

actual authorization. So, I anticipate that this program will grow as they indicate their needs for additional activity around them.

Senator GALLEG0. Is 2028 a realistic goal at this point?

Mr. GARRISH. I am not, well, I think—

Senator GALLEG0. It's not a judgment call, but just out of curiosity.

Mr. GARRISH. I think they have—we are going to be able to take one of the reactors in the pilot program that's going to be available for their use immediately. So, this is going to move fairly quickly. We have to get—it's not just going critical, we have to actually do—we have to produce power, too.

Senator GALLEG0. Yes.

Mr. GARRISH. So, we have got to go to the next step, but they are basically ready to go fairly soon.

Senator GALLEG0. Okay. That's good to hear.

My next question is for Dr. Laufer. Your company, Kairos Power, has led the industry in deploying advanced nuclear technology, and rapidly deploying nuclear is exactly what the ARC Act really aims to do to be helpful in that regard. How would the ARC Act help foster innovation in the nuclear space and improve DOE as an industry partner, and how else can Congress work with industry to get new technologies out the door fast?

Dr. LAUFER. So, Senator, thank you for the question and for your support and work on the ARC Act.

My perspective is that the life cycle from demonstration to deployment is the key area where federal investment provides the biggest opportunity. I do think that there are—we have to look at the full spectrum of incentives and programs and make sure that they all work together in a consistent way. I think that the ARC Act addresses issues for that early fleet deployment, and that allows us to develop confidence with our order book, with our commercial activities. I would say that those policies have to be complementary with the demonstration phase.

And so, for us, the ARC Act is addressing issues that are a little bit further down the road. We are focused right now on the execution with cost certainty for the demonstrations. But I think building that bridge with consistent policies for companies at each step in that process is crucial. And providing that predictability for the commercial fleet deployment and building that order book is key. So, thank you for the support and work on the issue.

Senator GALLEG0. Well, thank you. And you know, there is a real bipartisan want, which I think has been missing for quite a while. It was here before me, just to be clear, but now I think there's more critical mass of support for nuclear energy, both SMRs, traditional, and anything else that comes down the line. I think it's a perfect opportunity to really move on the legislative side, on the executive side, and try to put as much nuclear power as we can on the grid, and I look forward to working more on this in the future. Thank you, Mr. Chairman, and thank you, Ranking Member.

The CHAIRMAN. Thank you.

Senator BARRASSO.

Senator BARRASSO. Well, thanks so much, Mr. Chairman. Thanks for holding the important meeting. Thanks to my colleague for the comments that he has just made on this same topic.

So, my first question is to Secretary Garrish. Thank you for all the work that you are doing. You know, I believe nuclear energy is essential to our energy security as a nation. We need it now more than ever. The rise in energy demand that we are facing in the United States is daunting. Much of the demand comes from feeding the race for new technologies like artificial intelligence and advanced computing. The race for AI, fundamentally, is a race for energy. I think whoever secures affordable, reliable electric power is going to have a big head start and the advantage in the race for AI. Nuclear energy has to play a key role, so I am proud of the progress that we have made so far with this next breakthrough for the technology. And that's why, two years ago, we put forth legislation that I championed—the Nuclear Fuel Security Act. It became law, and it is helping secure our future fuel production.

The Advanced Reactor Demonstration Program is also key to supporting the next generation of nuclear technology. Just this month, the NRC approved the first construction permit ever for a commercial non-light-water power reactor. That's now held by TerraPower. And I am proud that this first-of-a-kind technology by this program has found a home in Kemmerer, Wyoming. TerraPower's Sodium reactor would be the first ever commercial-scale, next-generation nuclear power plant built in this country. The reactor is critical to the development of nuclear power in America, and I believe in the future Wyoming projects like this are going to provide reliable and affordable baseload power for Americans.

So, just to ask you, Mr. Secretary, your thoughts on how important is the Wyoming project, and what does it mean for the future construction of advanced reactors?

Mr. GARRISH. Senator, the TerraPower program is really the leading edge, I think, of what can happen with advanced reactors. So, we are very pleased that they got their construction license. They are moving forward in a very expeditious pace. And I think we are going to learn a lot from the process, but the contribution that they have made to advanced reactors is really very significant, and I am looking forward to its significant success.

Senator BARRASSO. Terrific.

In May of last year, President Trump announced an executive order on nuclear energy and national security, and it focuses on the Federal Government accelerating the development and export of U.S.-designed advanced nuclear technologies. The goal is to ensure the effectiveness of our military and enhance the export of American nuclear technologies around the world. Currently, Russia and China are rapidly deploying these technologies internationally. We partially addressed this in the 2024 bill, my bill, that was the Prohibiting Russian Uranium Imports Act. It was signed into law. It banned imports of Russian uranium and was essential in providing the market certainty needed to expand American uranium production. Right now, Russia and China still account for about 95 percent of nuclear reactors currently under construction. The Energy Dominance Financing Program is tasked with helping Americans dominate this space through loan financing of projects.

What milestones do you plan to achieve this year in these financing projects, and what types of nuclear-related projects are you considering?

Mr. GARRISH. Two that I would like to bring to your attention. Senator BARRASSO. Please.

Mr. GARRISH. One is basically the domestic enrichment work that we have done here in the United States thanks to the appropriations from the Congress. We now are in the process of finalizing domestic enrichment to the amount of \$2.7 billion, and that is going to make U.S. enrichment available to the U.S. without needing to have the Russians, which are banned, starting in January 2028.

The second point is on overseas sales of our products. When we get the products licensed in the United States, there is no limit, really, in my judgment, to what we can do overseas. And one of the things that we are doing is putting in a program where we not only sell the product, but we sell the licensing at the same time. In other words, I would like to get the people in the countries that are going to receive these reactors, their regulators, we would like to have them understand what we do in the United States and the gold standard that we bring to regulation and to transfer that over to the countries receiving the reactor. We think that will expedite the possibility of getting these reactors sold around the world.

Senator BARRASSO. My final question, Mr. Chairman, is to Dr. Wagner.

You know, once mined, uranium required to fuel nuclear reactors must still be converted into a gaseous form capable of being enriched. The conversion of uranium is complex. It requires extensive infrastructure and expertise. We have heard repeatedly that the United States doesn't have domestic capacity to convert uranium. This is a fundamental block—a bottleneck, I believe—to achieving dominance in nuclear energy. How can the Federal Government partner better with private industry to accelerate the domestic conversion capacity, and what is your biggest need in private industry?

Dr. WAGNER. I know we are short on time but I want to thank you for the Nuclear Fuel Security Act and the work that you have done in this space. The fuel cycle is still our most critical near-term vulnerability, in my opinion. Secretary Garrish talked about the \$2.7 billion related to enrichment. That is super-important. One of the aspects that has not gotten as much attention is the other parts of the front end of the fuel cycle. I think you were alluding to the fact that, you know, first you mine uranium, then you mill uranium. The only operating uranium mill that we have in this country is in Utah, and its capacity is far less than what we would need. Then, after you mill, you convert it into a form that you can enrich. There is a lot of focus on enrichment, of course. And then, you de-convert it into a form that you actually make the fuel out of for a reactor. Those other parts besides enrichment need more attention as well.

And as an example, we have one conversion facility operating in this country. And it has capacity up to about a third of what we actually need. And it's a rather old facility as well. So, conversion, deconversion, and milling, as well as mining, all need attention.

Senator BARRASSO. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman.

Welcome to the Committee, gentlemen.

Assistant Secretary Garrish, always good to see you. You have familiarity with some of the important legislation that has preceded today's hearing where we have been able to successfully do some things when it comes to advancing our nuclear opportunities. I led the Energy Act of 2020 and NELE—the Nuclear Energy Leadership Act—to establish the HALEU Availability Program and lay the groundwork for the advanced reactor deployment. DOE has now made initial HALEU production awards. This is an important step. So, from your perspective, what practical steps does the Department of Energy, working with Congress, need to take to build on that and to ensure that fuel supply does not become this pacing challenge for deployments? You know I am very interested in an opportunity to see a microreactor pilot there at Eielson Air Force Base. So, what do we need to do to ensure that fuel supply is not going to be our challenge here?

Mr. GARRISH. Well, I believe that the question of enrichment is one of the most important ones that we have to face. And we have been able, because of the congressional action and your appropriations, to begin that process. We are right now in the process of doing the milestones for enrichment, and I think when that gets done, which will be over the next several months, we will begin the process to build domestic enrichment facilities here. And that will lead us to not having to worry about the Russian imports at all.

If, in fact, that is a long-term problem, we do have some banks of materials that are available. They could be allocated. And then, on top of that, we have the Defense Production Act, which could help assure that there are no companies that would be without the uranium that they need.

I did want to say just one thing about the microreactors. The work that is being done in Idaho by John Wagner's people in terms of authorizing these microreactors, these are perfect products for Alaska. And the thing that we really need to do is look for opportunities in Alaska to demonstrate them, as I think that in these remote areas this is really the answer that a lot of the communities are looking for. They don't have to transport the diesel in. They have got long-term, reliable, inexpensive power, and I think that that's really what we need to work toward together.

Senator MURKOWSKI. And I appreciate you just volunteering that because this is something that we are looking at very clearly, not only for the purposes of how it can provide for national security needs with regards to our military installations, but to your point, to some of our very remote communities that are diesel-based, right now, they are looking at the price of diesel and they are just—it's not good here. And quite honestly, we shouldn't be powering our communities on diesel-powered generation in the year 2026 anyway. So, we are quite anxious for this.

And so, Dr. Wagner, let me ask you about that, just kind of following on Assistant Secretary Garrish's observation here, and specifically to Alaska, what does INL need now, in terms of capabilities for the testing, for the fuel qualification, for the systems vali-

dation? It sounds like they are hurrying things up within the Department here as we address the fuel side of things. What do you need on the testing and proving-out side?

Dr. WAGNER. So, first, thanks for that question and also for the partnership that we have had with a variety of representatives, including yourself, in Alaska, related to the Alaskan needs. I think it has been a very positive relationship in a sense that it has helped us understand what are the power needs of these remote communities, and what are the power needs at Eielson Air Force Base and et cetera. So, as we are developing these technologies, we have that knowledge in mind. We are not, you know, a hammer looking for a nail, so to speak, we are actually well-informed, and it is because of those engagements.

In terms of what we need, we have, and I put in my written testimony that we have a whole lot of capabilities that exist at the laboratory and that are being developed, particularly like our testbeds. But infrastructure is aging and it is at capacity. In fact, we are really stressing the capacity of what we are able to do at this moment when there is so much interest in all this different testing, be it fuel testing, fuel testing under various conditions, reactor testing and so forth, recycling, and demonstrating those capabilities. So, there are a number of infrastructure challenges that we face every day. We would welcome help with resources to support that.

Our most recent challenge has been fuel fabrication capability for the initial reactors. You may know that, you know, initially, if you are going to demonstrate a reactor, there may not be a commercial capability. In fact, oftentimes there is not a commercial capability to fabricate that fuel. And once you have been able to demonstrate that and go commercial, then you can go to commercial fabrication. So, we are seeking to develop something called the advanced nuclear fuel fabrication laboratory. That's number one on my list.

Senator MURKOWSKI. Great. I appreciate that because we are looking at appropriations now and how we make sure that all this knits from the agency to what we are doing within our national labs, to help facilitate that on the ground, whether in Alaska or around the country.

Thank you, Mr. Chairman.

Senator RISCH [presiding]. Thank you, Senator Murkowski.

You will be happy to hear that there are some changes coming on this planet that I think are going to be incredibly significant. Dr. Wagner and others may want to talk about this a bit, but we are going to turn the switch on the SMR very soon, the small modular reactor, which is really a milestone and a change in the way that energy is going to be delivered on this planet, but not long behind that is going to be a microreactor. Now, that may be of interest to some of your out-back places, and we don't have an exact date, do we yet, Dr. Wagner, on that? Would you care to make a prediction on when we turn the switch on the first micro?

Dr. WAGNER. So, we do anticipate achieving three criticalities in systems that would be characterized as microreactors by July 4th—

Senator RISCH. There you go.

Dr. WAGNER [continuing]. Of this year. I would like to clarify that those won't be power reactors that could immediately be deployed in Alaska. But going critical is the first step in that pathway.

Senator RISCH. But it doesn't take an imagination to realize what that's going to do to the delivery of power, not just in the United States, but on the entire planet. And again, the SMR is a huge step, but the micro is going to be even larger than that.

Incredibly important hearing that we are having here today. Because there aren't that many people here, don't take that to mean there isn't interest. We have got lots of stuff going on this morning. It's getting toward the end of the week. So, there is a lot of interest in this. I think most Americans aren't fully dialed in with the fact of the renaissance that nuclear is having in the United States and, for that matter, even more so, I think, on the planet. We had the unfortunate incident in Three Mile Island, which set us a generation back because people were afraid of it, even though no one got injured or killed. It scared people, and the result of that was we really lost a generation. That's getting behind us very quickly right now for a number of different reasons. Number one, I think, the industries have had such a safe history since then that people realize that they overreacted to Three Mile Island.

But then, secondly, we have got a demand on this planet that is staggering, really. First of all, you have a war that started on a continent that really changed the way that the European continent is gathering energy, and it isn't going to be from Russia now, it's not going to be Russia tomorrow, and it is going to be a long time before anybody looks back to Russia indeed. By the time they look back there, the type of energy they want to sell is probably going to be not that much used anymore. The next thing is, we are getting these huge estimates as to the kind of energy we are going to need because of AI. Now, I don't understand that. I know that probably you guys do, but I don't understand how AI consumes that kind of electricity, but it is staggering what it is going to do to the demand for electricity here in the United States, and for that matter, around the world.

So, with that, we are proud in Idaho to host the INL. Dr. Wagner does a great job there. We have a long, proud history. I brag all the time that in 1951 we generated the first electricity by nuclear power there. We still have the first three light bulbs, I think, that are in the museum there that we lit in December 1951. And we built 52 reactors since then. And Idaho is proud to host the flagship lab in the world, really, on nuclear energy. And as we go forward, there are all the different aspects of this that are going to need attention, and they are going to start at the INL. Fuel certainly is, Dr. Wagner, something that you pointed to. Again, the war has changed dramatically where we are. That whole industry had shifted to Russia. We're bringing it back. And Senator Barrasso was certainly a leader on this, with others of us who understood that we have got to be able to produce our own fuel and distribute it.

So, with that, I do want to talk about the most recent thing that I and others have done, with your help, and that is on the financial risks that are involved when you have new technology coming

down the pike. We all know that with nuclear power there are risks that are different and essentially higher than in other industries. And as we all know, in a free market system, like we have in America, the investors are risk-averse, so they want the least risk possible. Now, we, the U.S. Government, way back when, waded into that when we talked about guaranteed loans and that sort of thing. It was really the only thing that could have moved us forward because the investors were reluctant. But now, with the new technology, we have another risk, and that is cost overruns, because you are dealing with something you haven't tried before, and when you try and it doesn't work, it is very, very expensive. So, we have developed the ARC Act. And I think all three of you probably are familiar with the ARC Act. And since you are from Idaho, I am going to start with you, Dr. Wagner, and tell me your thoughts on the ARC Act and what benefit you think it will have for the industry.

Dr. WAGNER. Well, thank you for that and thank you for the kind words and the strong support that we have received from you, Senator. It's wonderful. So, I appreciate that very much.

As you have put your finger on, cost overrun risk is really the most significant barrier to a utility investment in a first-of-kind technology period, but particularly with a commercial nuclear reactor. The tale of Vogtl, which I now think is a major success in terms of demonstrating that system in that we were able to build it, but going from an estimated \$14 billion to over \$30 billion is not anything any utility executive wants to experience, I am sure, or their board that they work for, or their public utility commission.

Senator RISCH. Or their customers.

Dr. WAGNER. Or their customers, exactly.

So that's, in my opinion, the most significant thing that holds back utilities and others from building new large nuclear power plants. And of course, we are not going to drive down the cost curve, which we think we absolutely can do and we have confidence in that, until somebody does the first one and the second one and the third one. And so, while I am not a financial expert in terms of the right mechanisms, it is that cost overrun risk that we routinely hear as the most significant impediment. And that is, of course, what your ARC Act addresses, so I appreciate your leadership on that.

Senator RISCH. Mr. Secretary.

Mr. GARRISH. Well, overruns are the one issue that we need to really resolve, and we appreciate your efforts to look at legislative fixes to that. And so, thank you for doing that.

The utilities are all reluctant to be the first ones to actually order a reactor because they know, with the potential for overruns, a negative reaction on the funding could result in a stock price problem for them. And so, what we have got to do is figure out a way to incentivize the utilities—and the manufacturers and the constructors—incentivize on-budget and low-cost arrangements. Right now, there is little incentive for them necessarily to do this, and the problem is repeatability. We will get there. The question is, how do we do that in a fashion that doesn't take so long and so many different units have to be produced before we are at that point. So, your efforts and the efforts by the Congress, I think, are

very important here. And we will look for ways to do that in the Department and look forward to working with you on that.

Senator RISCH. Appreciate that.

The other thing that has struck me in recent years, and I have been here doing this a while, is the new actors that are entering the industry because of the advances we have made in the SMR, obviously, and the micro that are coming down the pike. There are a lot of people who want a piece of that. And there are risk takers who are entering and there is a constant stream of them into my office. And we have never had that over the years I have been doing that. Doctor, you're up.

Thank you.

Dr. LAUFER. Senator, thank you for the question and for your work on the ARC Act.

I think that the ARC Act addresses a really key gap which private investment has struggles with, particularly for early fleet deployment. I would say one thing which I think is important—when I look at the structure of different federal investments and programs, I think that the incentives are really important to make sure that they are fully aligned with the commercial goals of where we need to take for industry. And particularly not just delivering the projects with cost certainty of being able to have the right incentive to drive down costs. And so, particularly when we look at the cost risks for early deployments for the fleet, making sure that there is flexibility to allow the time to take to find those opportunities is very important. So, I think that the support here in making sure those risks are protected against, but also making sure that they are aligned so that the inherent risk in early projects doesn't end up—you don't end up with too much contingency, because if you have a lot of contingency on the costs, you may hit your cost targets, but your cost targets may still be too high.

And so, making sure that all of the programs work together to allow demonstration to be done with focused and excellent execution is really key, and just making sure that those policies are consistent. I think that is completely possible, and the ARC Act can play a very important role in that process.

Senator RISCH. Thank you. I think that's an important observation. I am going to close here, but I would be remiss if I didn't mention, in the other hat I wear as Chairman of the Foreign Relations Committee, I have a constant parade of people from other countries who are excited about nuclear, and they are out shopping. We do the best to be a salesman for U.S. technology. We compete with the Russians, the Chinese, and the French, as everybody knows. And the Russians and the Chinese are voracious competitors because they don't have a capitalist system like we do. All of the capital in the country is controlled by the government, and they don't have the same risk aversion that the private sector does. So, it's a heavy lift, but I can tell you this, the reputation of the U.S. nuclear industry is not lost on the world. They want to do business with us first. But on the other hand, the siren of a cheaper product often drives them away.

With that, Senator Daines.

Senator DAINES. Chairman Risch, thank you, and with your Foreign Relations hat on here and your nuclear hat for a moment, just

to pile on that earlier conversation on microreactors, where this might all head, and as we think about a more distributed model instead of command and control, a utility model, a distributed model will, of course, overcome some of the transmission issues that we face, which is one of the big barriers——

Senator RISCH. Huge.

Senator DAINES [continuing]. Toward delivering energy. But I was in Nigeria after the Munich Security Conference, and I did a swing through Sub-Sahara a few weeks ago. Nigeria has 87 million people without electricity. It's the most underserved—the most people in the world, of any country, with no electricity. And by the way, Nigeria will be the third largest country in the world by population in 2050—behind India and China, it will be Nigeria. So, if you combine microreactors, perhaps, with Starlink Mini, which I have got one of those in my pickup in Montana because when I travel around the state, I can get out in the middle of nowhere—and I know Senator Heinrich and I enjoy the great outdoors—but sometimes it's nice to stay connected, when needed. But you take the ability to put Starlink Mini and microreactors, and suddenly you solved a network problem and an energy problem, and by the way, ISIS command control is up in Nigeria now. So, think about what we can do to improve taking people out of poverty and reducing the risk of radicalization with some of these groups. Anyway, it solves a lot of problems, but——

Senator HEINRICH. Don't tell my staff about Starlink Mini.

Senator DAINES. Okay, I will not tell your staff about it. We strike that from the record, Mr. Chairman.

[Laughter.]

Anyway, back to the topic at hand. For more than four decades, Montana has had restrictions that prohibited nuclear energy development in the state, limiting our ability to maximize our energy potential. However, in 2021, Montana took an important step forward by passing House Bill 273, repealing outdated restrictions and transferring nuclear project approval to the state legislature. Montana opened the door for the deployment of nuclear energy. Expanding nuclear capacity, both in Montana and across our great nation, is critical to maintaining a resilient electric grid for the distribution of firm, dispatchable electricity. We need more baseload power. But today, Montana still does not have any nuclear generation sites. The Trump administration is working to aggressively reinvigorate the nuclear energy industry and quadruple our nuclear energy specific capacity by 2050.

Secretary Garrish, as we work to restore American energy dominance, what role can advanced nuclear, like small modular reactors—we talked about the SMRs—microreactors, and fuel recycling play in Montana, and what needs to happen to accelerate that deployment?

Mr. GARRISH. You know, smaller reactors have the ability to be adaptable to little, not-as-dense populations, Senator, so they could be very helpful in places like Montana.

I wanted to go back to one comment that you made about international because it was very important. We had an energy minister come in to the Department from overseas. I won't mention the country. And he was very interested in micros because he wanted

to move them out, potentially, to his country and see how this would work. He had his country divided into seven areas, and a military base in each one, and he wanted a micro in each location. And I thought, this is really the start of a complete change in how we think about electricity—more distributed. And in places like Montana, this could be particularly useful.

Senator DAINES. Yeah, and by the way, I mean, I know we do live in the middle of nowhere, and we love that, by the way, but where we have Colstrip right now, where someday we could have nuclear—a complementary kind of power there. While we are in the middle of nowhere, that power plant serves a large capacity of populations throughout the Northwest. We have a problem sometimes getting it out to the West Coast because they don't like coal-generated electrons. I always found electrons to be nice no matter where they come from, but that's a different discussion we have in Washington.

But it can serve both the issue with the rural, but also, we are talking about a massive power generation center there in eastern Montana.

I wanted to switch gears and talk about Colstrip, speaking of Colstrip. Between 2015 and 2020, the United States retired an average of 11 gigawatts of coal-fired capacity each year. This past weekend I was over in the Netherlands visiting ASML, looking at what is going on there serving the massive part of the silicon chip supply chain. But you talk to the folks in the Netherlands, they made poor energy choices back in 2006. Germany did the same thing—decommissioning nuclear plants, decommissioning coal-fired plants, not having baseload capacity. It is absolutely one of their key constraints now to their economic growth. The Netherlands are sitting there struggling at about one percent. Germany, they are about flat. Had they made better energy strategic choices 20 years ago, they would be in a very different position than they are today. We can't let that happen to the United States.

We saw the retirement of this baseload power. It eroded reliable baseload power at a time when demand has continued to grow. Most estimates say we are going to need 50 to 80 percent more energy in the next 25 years than we consume today. In Montana, the Colstrip power plant, one of the largest coal-fired facilities in the West, has been critical for affordable, resilient energy and a key economic driver for the region. And let me be clear—I am not opposed to intermittent sources of energy, but I will tell you something, when high-pressure systems move into Montana, the temperatures plummet, by definition of a high-pressure system. What happens when high-pressure systems move in? The wind stops blowing. So, at a time when you have maximum load on the system, you have got minimal intermittent energy supply, and if it were not for Colstrip baseload power, and God bless coal, we would literally have had life and death situations in Montana. They bailed out, thankfully, the grid at that moment, for what it's worth.

At its peak, Colstrip can generate 2,000 megawatts of electricity across all four units, supporting high-paying jobs, local businesses. The shutdowns of units 1 and 2 in 2020 marked a significant loss of capacity and economic activity. Units 3 and 4 continue to operate today with a combined capacity of 1,480 megawatts of dependable,

reliable, God-bless baseload power. Together with the associated mine, Colstrip supports 2,000 jobs, not to mention the tax base this provides for our state as it relates to funding education across Montana.

A recent study conducted in 2025, June, by Idaho National Lab—God bless Idaho, Chairman Risch—found that advanced nuclear technologies could be deployed at the Colstrip site by leveraging existing infrastructure, a skilled workforce, and significant transmission capacity, including the planned North Plains Connector. Adding nuclear capacity to Colstrip could support an additional 680 jobs according to the study.

Dr. Wagner, given these factors, can you speak to the feasibility for advanced nuclear at or around Colstrip, and how projects like this could help the United States compete globally and support our long-term 2050 goals?

Dr. WAGNER. So, first of all, thank you for the question, and actually, you are actually quite informed of the program study on Colstrip relative to viability of nuclear there. And from that study that you referred to, it looks like an excellent choice to add to the capability of generation there at Colstrip, and possibly long-term, maybe it replaces coal, maybe it doesn't. We are seeing this across the country. Colstrip is a great example of where you already have a facility there. You already have a site. You already have, particularly, transmission infrastructure that connects that site, and energy-intelligent workers already there as well. That study also estimated that some 60 to 75 percent of the current workers there would be directly applicable to working if a nuclear power plant was constructed there.

And so, another example, it's not in your state, but is in Kemmerer, Wyoming, where you have got a similar situation with existing transmission, existing infrastructure, transitioning to nuclear, so, whether it adds to the coal site or it ultimately replaces coal, either way, it is more power, more baseload power, as you mentioned. And so, I think it is an outstanding candidate.

Senator DAINES. Thank you, Dr. Wagner.

Right now, my last question is, we are in this race with China and with Russia, not just to deploy advanced nuclear, but to secure full fuel supply chains that make it even possible. The Department of Energy's \$2.7 billion investment in domestic enrichment is an important step toward rebuilding capacity right here at home.

Secretary Garrish, how can we expand relationships with partner countries like Kazakhstan, the largest supplier of uranium in the world, and American enrichment capabilities in a way that reinforces our national security while still leveraging trusted allies like Kazakhstan and avoiding new supply chain risks?

Mr. GARRISH. Well, enrichment has to be from friendly countries that we can trust. And I think as we do that, the first thing we have to do is assure that we can do it ourselves as the number one priority. And I think the \$2.7 billion that Congress appropriated into that for domestic enrichment was really the first step. Now, beyond that, we do need other countries for enrichment. We still will import. And we will also need uranium. So, there are going to be needs of that, but we need to make sure that these are reliable countries and that we have sufficient supply here in the United

States to make sure that our industry is adequately supplied. So, I support what you are suggesting on that front, and look forward to working with the Congress to make sure that we can have an adequate supply of the fuel that we need.

Senator DAINES. I will just conclude with a comment, Mr. Chairman, and then I will be done, and we will put on our foreign relations hats here for a moment. The work the Trump administration has done in opening up the TRIPP—the Trump Route for International Peace and Prosperity—that corridor between Azerbaijan and Armenia, as we look at what can eventually, whether it is through Turkey or eventually through Georgia, getting to the Black Sea. As Brzezinski once said, “Central Asia is the wine bottle, the Caucasus are the cork.” This administration has removed the cork. That flow of natural resources—oil, gas, critical minerals, and talk about uranium now, moving westward instead of prior to the north to the Russians or the east to the Chinese. This is probably one of the more untold stories that’s going on right now, geopolitically, in Washington, and it’s a credit to this administration for seeing the vision and the importance, especially when we think about the nuclear supply chain and Kazakhstan.

Thank you.

Senator RISCH. Thank you, Senator Daines, well said.

To those of you who have participated today, thank you so much. It’s an exciting time for you, I know, to be in your industry with things moving the way they are, and it’s a critical time, really, for the nuclear industry, because what we do right now is going to set the stage for decades ahead. So, we really appreciate your participation and your work on that.

So, that concludes today’s hearing. And any Senator who wishes to submit additional questions for the record may do so. The deadline for submitting is 6:00 p.m., Thursday, March 26th.

Senators also have until 6:00 p.m. next Thursday to add statements for the record for today’s hearing.

Again, thank you to the witnesses who testified here this morning and all those who participated. I think we have done a good job here of underscoring how important the work is in the nuclear industry as we move forward.

With that, the Committee is adjourned.

[Whereupon, at 11:16 a.m., the hearing was adjourned.]

APPENDIX MATERIAL SUBMITTED

United States Senate Committee on Energy and Natural Resources
The Department of Energy's Implementation
of President Trump's May 2025 Nuclear Energy Executive Orders
Questions for the Record Submitted to The Honorable Theodore Garrish
March 19, 2026

QUESTIONS FROM RANKING MEMBER MARTIN HEINRICH

- Q1. Last year the Department updated its regulatory framework for authorizing new reactors. This included changes the requirements for safety, security, and environmental protections. What were the roles of the Idaho National Laboratory and the Nuclear Regulatory Commission in reviewing and revising the Department of Energy's (DOE) directives?
- A1. Idaho National Laboratory provided technical input and administrative assistance to Department of Energy's (DOE)-Nuclear Energy's personnel in streamlining DOE's directives consistent with the President's Executive Order (EO). Nuclear Regulatory Commission (NRC) personnel did not assist DOE in this effort but rather observed DOE's reactor pilot program.
- Q2. Do you believe that DOE has the authority it needs to fulfill the directives in the President's executive orders?
- A2: Yes.
- Q3. What scientific analysis did DOE conduct to conclude that advanced nuclear reactors do not have significant environmental effects—thereby establishing a categorical exclusion under National Environmental Policy Act (NEPA)?
- A3. The Department concluded that advanced reactors do not have significant environmental effects based on scientific data and recent NEPA reviews, which resulted in Findings of No Significant Impact (FONSI) as described in its written record of support. Since 2021, DOE has completed three environmental assessments (EA), Microreactor Applications Research, Validation, and Evaluation, Molten Chloride Reactor Experiment, and Demonstration of Microreactor Experiment, resulting in FONSI. Additionally, NRC has completed three EAs, Kairos Hermes 2 Test reactor, Abilene Christian University's Molten Salt Research Reactor, and Long Mott Small Modular Reactors Construction Permit, concluding FONSI. Likewise, since 2017, DOE completed two Environmental Impact Statements (EISs), the Versatile Test Reactor and Prototype Mobile Nuclear Microreactor, resulting in no significant effect to the

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quality of the human environment. Additionally, the Department relied on two topical reports pertaining to TRI-structural ISOtropic fuel and fuel in university Training, Research, Isotopes General Atomics reactors and experiments from Experimental Breeder Reactor-II.

It should also be noted that a categorical exclusion (CE) is not an exemption from project-specific environmental review. For each reactor project, DOE will review the aspects of the proposed project to determine if it meets the criteria of the new CE including the conditions that apply to all DOE CEs. Only if DOE determines that all the applicable requirements and conditions of the CE have been met, then it will proceed to review the proposed action for “extraordinary circumstances” and potentially proceed to issue a CE determination. If the CE requirements are not met, an environmental assessment or environmental impact statement will be prepared.

- Q4. What framework is DOE implementing to update this analysis as new data on research and test reactors becomes available from the Reactor Pilot Program, DOD Janus Program, and through the U.S. Nuclear Regulatory Commission.
- A4. As part of DOE’s continuous improvement program and philosophy, DOE will evaluate new technologies for consideration in the NEPA process.
- Q5. What is Department’s evaluation framework for determining when an advanced nuclear reactor CatEx may apply within a Nuclear Safety Design Agreement?
- A5. All new advanced nuclear projects will be evaluated for NEPA determinations, whether EIS, EA, or CE.
- Q6. You oversee several public-private partnership opportunities for nuclear fuel cycle, testing, and technology demonstrations. These opportunities bring benefits to communities across America. They boost the innovation economy and spur local construction. Do you commit to implementing the Department’s partnership opportunities solely based on merit, and without political bias for geography or affiliation?
- A6. Yes, DOE commits to awarding entities based on merit and without political bias.
- Q7. Pursuant to Congressional authorizations in the Nuclear Fuel Security Act, and the President’s directives to strengthen the domestic nuclear supply chain, in January DOE

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announced it would be awarding \$2.7 billion to three companies (\$900 million each) to build new domestic enrichment capacity in the United States. What milestones has DOE required in these agreements and will DOE require strict adherence with those milestones in order for awardees to receive payment?

- A7. Each contract is different and has business-sensitive milestones, which have been agreed to or are currently being negotiated. DOE has negotiated each contract to assure successful project completion. The Department will adhere to these mutually agreed upon performance-based milestones throughout the contract period, ensuring accountability while reducing taxpayer risk. Awardees will receive payment only upon DOE review and confirmation that milestones are documented and completed.
- Q8. In August of last year, DOE updated its standards and directives related to authorizing nuclear facilities. These changes were not publicly available until January of 2026. Can you identify the public notification and engagement requirements that exist within DOE policy (including DOE P 420.2 and P 420.3) and as detailed within DOE-STD-1271-2025?
- A8. As it concerns DOE's internal policies, procedures, or standards, generally there is no formal public notification requirement. Nevertheless, I decided to make these documents publicly available in this instance. Public access is a prudent policy unless it is legally restricted.
- Q9. Implementation of DOE's reactor and fuel line pilot programs have relied significantly on staffing capacity from NE and the Idaho National Laboratory. At any point during the implementation of these pilot programs, has NE had to reassign staff from Congressionally authorized activities to support these programs?
- A9. No. DOE used existing Office of Nuclear Energy (NE) staff and other Departmental staff to support this effort. DOE has received support from the NRC, but this support was funded by NE. Further, the Department received support from the Naval Nuclear Propulsion Program, DOE's Office of Environmental Management and DOE's Office of Environmental Health, Safety, and Security, but no funding from NE was provided for this support.

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QUESTION FROM SENATOR JAMES E. RISCH

- Q1. During our meeting last April, we discussed our concerns regarding the risk of cost overruns for first of a kind commercial reactors and efforts to create a limited cost-share program for cost overruns. How would this policy be beneficial in bringing new commercial projects online?
- A1. Cost overruns represent one of the largest impediments for investment in first-of-a-kind commercial reactor projects. Risk reduction efforts can attract investors and partners and may reduce overall costs and timelines.

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QUESTIONS FROM SENATOR MAZIE K. HIRONO

- Q1. How is the Department of Energy (DOE) verifying that the reactor pilot program projects comply with established standards for quality assurance to provide confidence that they will be safe to operate?
- A1. All Reactor Pilot Program applicants are required to follow 10 CFR 830 Subpart A, *Quality Assurance Requirements*. The Department of Energy (DOE) utilizes and enforces the requirements of 10 CFR 830, Subpart A and NE O 414.1, *Quality Assurance*, for ensuring the proper quality is being applied to nuclear activities. Compliance is directed in their contracts (Other Transaction Agreements) and verified by DOE QA Subject Matter Experts and other staff personnel.
- Q2. What process is DOE using to verify that the test reactors are built in accordance with their authorizations? Who is conducting construction and pre-operation inspections? Who will be inspecting operations?
- A2. DOE's Office of Nuclear Energy (NE) is conducting construction and pre-operation inspections in accordance with 10 CFR 835 Subpart A, *Quality Assurance* and NE Order 425.1 *Verification of Readiness to Startup or Restart Hazard Category 1 and 2 Nuclear Facilities*. Operational oversight will be performed by NE's Idaho Operations Office per the established NE requirements.
- Q3. Will reactor pilot plants not located on DOE sites be covered under the Price-Anderson Act?
- A3. Yes.
- Q4. Does DOE still include the "as low as (is) reasonably achievable" (ALARA) radiation safety standard in its regulations? If not, when did the DOE remove the standard, what radiation safety standards are in effect as a successor to ALARA, and, if no standards are in effect, when will DOE have replacement standards in place?
- A4. At this time, 10 CFR 835 remains unchanged.

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QUESTIONS FROM SENATOR CINDY HYDE-SMITH

- Q1. President Trump's Executive Order titled, "Reinvigorating the Nuclear Industrial Base" directs the DOE to explore nuclear fuel recycling and reprocessing. To date, DOE has issued more than \$19 million in grants to five U.S. companies to research and develop recycling technologies for used nuclear fuel. What does the DOE see as the next steps to advance the president's priorities, and how is the Department leveraging other programs, funding, and partnerships to ensure nuclear fuel recycling technologies move from R&D to commercial-scale deployment?
- A1. The Department of Energy (DOE) believes these awards are an opportunity to reinvigorate the domestic nuclear fuel cycle, especially on the recycling and reuse of used nuclear fuel. The Department believes that recycling offers immense benefits to the American public by reducing waste, maximizing recovery of useful isotopes, limiting proliferation risk, streamlining operations, and increasing reliability. To transfer this technology from the lab to the market, the Department plans to continue support for RD&D activities.
- Q2. Additionally, what does DOE see as necessary milestones needed to achieve near-term progress on deploying this technology?
- A2. The Department continues to lead in closing the gap between research and development toward the demonstration of used nuclear fuel recycling by industry. The Department recently awarded \$19 million in grants through a first-of-a-kind funding opportunity, as noted in your question above, and will continue to support industry to meet the President's recent executive orders on commercial scale facilities.

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QUESTION FROM SENATOR ANGUS S. KING

- Q1. I'm encouraged that the Department is working to address the spent nuclear fuel disposal impasse, as evidenced by the recent Department of Energy (DOE) request for information (RFI) from states interested in potentially hosting "Nuclear Lifecycle Innovation Campuses". At the Maine Yankee Plant in Wiscasset, Maine, spent fuel has been stored in dry cask on the 11-acre Independent Fuel Storage Installation site since the plant's decommissioning over 20 years ago. What can this community expect in terms of SNF removal and the next stage for land use in the next 5, 10, and 15 years?
- A1. The Department of Energy (DOE) is encouraged by the interest of various states to work toward a solution. The RFI is a starting point to solve this pertinent issue, which will require Congressional and State legislative action. With legislative action and state acceptance of spent nuclear fuel (SNF), Nuclear Lifecycle Innovation Campus (NLIC) may create the possibility of moving SNF to recyclers at NLIC facilities.

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QUESTIONS FROM SENATOR CATHERINE CORTEZ MASTO

- Q1. Together, President Trump's May 2025 nuclear Energy Executive Orders (EOs) touch every facet of the civilian nuclear industry. Due to the wide array of policies and expediency of timelines required under these EOs, do you believe DOE should apply a public notification and engagement process for future activity?
- A1. Consistent with applicable law and good policy, the Department of Energy (DOE) notifies and engages with the general public on its activities.
- Q2. Will you commit to future transparency from your Office on these EOs – in order to notify the public, nearby communities, and provide expedient answers to Congress?
- A2. As we proceed, DOE anticipates interactions with States and Congress regarding the implementation of the President's EOs.
- Q3. As DOE continues to implement these EOs, will your Office commit to providing my staff, along with officials from the State of Nevada, with a joint briefing on any related activity occurring on the Nevada National Security Site (NNSS)?
- A3. To the extent my office is involved with NNSS, my office will work with members of your team and officials from the State of Nevada.
- Q4. How important is public confidence in our nation's ability to responsibly regulate the nuclear industry, and what specific steps are you taking to ensure the nuclear industry is safe?
- A4. On nuclear issues, having the confidence of the public is vital for regulators and public officials. DOE is committed to protecting public health and safety while advancing the development of next generation nuclear reactors. Also, DOE works with its sister agencies to support the development of safe advanced nuclear technologies.
- Q5. Is there an update on how DOE is working across the Administration to support the EO's workforce initiatives? Are there opportunities to expand existing programs and partnerships with Colleges and Universities, or a need to develop new programs?
- A5. Consistent with Executive Order 14302 Sections 5 (b) and (c), in conjunction with other agencies and offices within DOE, Nuclear Energy (NE) is prioritizing the next

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generation nuclear workforce through apprenticeship programs, university training and research grants, and workforce development programs. Also, in response to Executive Order 14302 Section 5(d), NE finalized an implementation plan that outlines actions to strengthen the nuclear energy workforce pipeline by expanding direct opportunities for internships and fellowships and increasing coordination and awareness of existing resources at Department of Energy National Laboratories for nuclear energy related students.

NE is significantly expanding the University Nuclear Leadership Program , now called the National Nuclear Talent Development Program , to further engage two-year technical college, trade schools, community colleges, and Historically Black Colleges and Universities. This program strategically targets institutions with relevant programs, particularly those partnering with or located near nuclear industry, national laboratories, four-year higher education institutions, and nuclear plants, to create impactful opportunities that support unique capabilities and bolster the nuclear energy workforce.

Additionally, my office is expanding its Consolidated Innovative Nuclear Research funding opportunity to incorporate a “National Laboratory Research Experience for Graduate Students” supplement. This initiative aims to enhance university-national laboratory collaboration and provide college and university students with direct research experience at DOE national laboratories, thereby strengthening the United States nuclear energy workforce.

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QUESTIONS FROM SENATOR ALEX PADILLA

- Q1. Safety must be the top priority when it comes to nuclear power, and that means regulators need the authority and the will to act when something isn't right. In California, communities have seen firsthand what happens when that oversight works to keep them safe. A decade ago, at the San Onofre Nuclear Generating Station, a flawed equipment modification led to a shutdown and raised serious public safety concerns. Then Senator Barbara Boxer, who chaired the ENR Committee at the time, listened to those concerns, warned that those modifications had proven to be "unsafe" and posed a danger to the millions living nearby, urging a criminal investigation. We are now faced with EO 14302 and an Administration that wants to restart such faulty facilities. Would you commit to take community opposition into account when evaluating these projects?
- A1. The Department of Energy (DOE) takes community perspectives seriously. However, the Nuclear Regulatory Commission (NRC) is responsible for evaluating nuclear safety for commercial reactor restarts. We respectfully defer to the NRC on this question.
- Q2. It is crucial that the American people can trust that their energy resources are safe and secure. In January, based on the executive orders, the DOE removed the As Low As Reasonably Achievable (ALARA) principle from DOE regulations, with no clear alternative framework for radiation protection. These drastic changes, undertaken with no clear justification, risk undermining faith by American people in the federal government's commitment to nuclear safety and responsible oversight. What are DOE's plans to implement an alternative radiation protection framework to ALARA, and what safeguards will DOE issue to prevent erosion of safety culture while such an alternative framework is under development?
- A2. At this time, ALARA remains in 10 CFR 835. Let me assure you that whatever action is taken by the Department, we will protect public health and safety.
- Q3. DOE significantly revised its standards, orders, and policies for nuclear facilities as directed by Executive Order 14301.
- Q3A. Please describe in detail the process for DOE's authorization of nuclear facility construction and operation. Please include the following steps at minimum: preparation and approval of the preliminary documented safety analysis (PDSA); preparation and approval of the safety basis documents, including the documented safety analysis (DSA), the technical safety requirements, and the hazard controls; preparation and approval of the safety evaluation report; preparation and approval of the readiness review plan; and preparation and approval of the readiness review final report. Please detail who the

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approving body is for each of these steps. Please detail which of these approvals is needed for a nuclear facility to begin non-nuclear construction, nuclear construction, and operation.

- A3A. A new DOE-STD-1271-2025, *Authorization Pathway for Nuclear Facilities*, was structured to streamline nuclear facility authorization. This standard recognizes that private applicants for DOE authorization may negotiate in an open dialogue with DOE to achieve safe and secure design, construction and operations in the most efficient and innovative method possible with minimized regulatory burden. The details of the approval process are rigorous and can be found in the publicly available DOE-STD-1271-2025.

For Hazard Category (HC) 1 Reactors and all new reactors under the Office of Nuclear Energy authorization, the Manager of NE's Idaho Operations Office is the Safety Basis Authorization Authority (SBAA). The Startup Approval Authority for all new reactors under Nuclear Energy authorization is the Secretary of Energy. For HC2 and 3 non-reactor nuclear facilities, the Idaho Operations Office Deputy Manager for Operations & Security/Chief Operating Office is the SBAA. For new non-reactor nuclear facilities, the Assistant Secretary for Nuclear Energy is the Startup Approval Authority. For non-nuclear construction that does not contain nuclear safety systems or special nuclear material, there is no Startup Approval Authority but other requirements apply.

- Q3B. Did DOE change the process for authorization for any step described in question (4)(a) as part of the revisions made pursuant to EO 14301, including changes to the entity that prepares or approves the plans or reports? If so, please describe these changes and explain why these changes were made.

- A3B. The Department revised its orders to streamline and expedite the approval process without jeopardizing safety. First, DOE eliminated all redundant requirements, which included duplicating United States Environmental Protection Agency's (EPA) requirements. However, all environmental laws and requirements still apply. Second, DOE removed data-gathering requirements, which prioritized reports rather than safety. Lastly, DOE established standards rather than prescribing a one-size-fits all approach to

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federal approval. For example, DOE previously defined how System Engineers are trained, whereas the streamlined rules established standards that ensure they are competent in maintaining their safety systems.

Q3C. As one example of DOE's revised orders, the new NE Order 458.1 on "Radiation Protection of the Public and the Environment" makes optional several former requirements for protection of drinking water, ground water, and biota; monitoring, independent verification, and government notification prior to release of sites from DOE control; and other environmental and health requirements. Please explain why such changes were made and how DOE will ensure equivalent levels of environmental protection as under DOE's former Order 458.1.

A3C. The requirements cited above are EPA requirements that are already binding on DOE contractors within their scope. Including those requirements in DOE's internal orders created redundancies that increased regulatory burden without any increase in environmental protection.

Q3D. Many of these changes appear to have been finalized by August 26, 2025, just 95 days after EO 14301. What steps did DOE take to accomplish these sweeping changes in that short timeframe?

A3D. A team of experts in all the regulatory disciplines and with decades of experience in regulating DOE reactors and non-reactor nuclear facilities worked together to ensure that the correct requirements were established. The criteria in A3B) above was used to determine what to eliminate as unnecessary and over-conservative requirements.

Q3E. Which offices within DOE and which external stakeholders were involved in these efforts to update DOE standards, orders, and policies? In what capacity were each of these entities involved?

A3E. Many DOE offices were involved including the Office of Nuclear Energy, Office of the General Counsel, the Office of Environment, Health, Safety and Security, the Office of Environmental Management, the Office of Enterprise Assessments, and the National Nuclear Security Administration.

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Q3F. Was there documentation of written justification for each individual change? If so, please provide this written justification.

A3F. As discussed in answers above, the changes were carefully made by a team of experts with extensive regulatory experience across the Department. In addition, the Department has provided extensive information publicly on the rationale and justification for these changes. Such information is widely available on DOE's websites in guidance documents including frequently asked questions and other sources.

Q3G. Although most of the new standards, orders, and policies appear to have been finalized on August 26, 2025, the new documents were not viewable by the public until February 12, 2026, after NPR reported on these changes and submitted a FOIA request. How will DOE ensure that future changes to nuclear policies are made publicly available? How will DOE ensure that implementation details and updates for the Reactor Pilot Program, Fuel Line Pilot Program, and related programs are made publicly available?

A3G. Although there is no general requirement for these standards, orders, and policies to be public, I decided to make these documents accessible to the public. I believe it to be a prudent policy to post these documents unless legally restricted. The Department will release details and updates at the appropriate time pertaining to DOE authorization activities.

Q4. DOE has selected 10 companies and 11 projects under the Reactor Pilot Program, as well as 4 projects under the Fuel Line Pilot Program.

Q4A. For each of these 15 projects: has DOE approved a preliminary documented safety analysis (PDSA)? Has a documented safety analysis (DSA) or readiness review plan been submitted? What is the timeline under which DOE expects to review and approve each company's PDSA (if not already approved), DSA, and readiness review plan?

A4A. At this time prior to my hearing, four PDSAs have been approved. DSAs and Readiness Review Plans have been submitted for several others and are under review. DOE-STD-1271-2025 requires that DOE provide comments or approve the PDSA or DSA within 45 days.

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- Q4B. According to public reporting by Reuters, Aalo Atomics, Antares Nuclear, Deep Fission, Last Energy, Oklo, and Valar Atomics have begun construction. However, according to LinkedIn posts by Bob Boston, Manager of the DOE Idaho Operations Office, only Aalo Atomics, Antares Nuclear, Radiant Industries, and Valar Atomics have had their PDSAs approved, which is required prior to beginning of nuclear reactor construction. On what basis have companies who have not had approved PDSAs begun construction?
- A4B. Companies may begin construction if it does not include nuclear safety systems or possession and receipt of special nuclear materials. This is in line with NRC's policies.
- Q4C. For each of these Reactor Pilot Program projects that have begun construction, has DOE conducted environmental review as required under NEPA? If so, please provide a copy of such review and explain why such environmental review is not publicly available. If not, please explain why such review was not conducted.
- A4C. The individual reviews will take place prior to the approval of the documented safety analysis and will be available online once complete.
- Q5. NPR has reported DOE has issued an internal memo directing that Reactor Pilot Program awardees have access to a "concierge team" to "provide assistance to the applicant to ensure expeditious processing of its application."
- Q5A. Please provide a copy of this memo.
- A5A. The purpose of the Concierge Team is to have a readily available cross-cutting team that can remove roadblocks/barriers, effect immediate solutions to complex applicant issues, and add efficiency to DOE's facilitation of pilot program applications. The pilot program applicants have access to a Federal Point of Contact that meets with the Concierge Team on a weekly basis and elevates identified challenges, as appropriate.
- Q5B. Do Reactor Pilot Program awardees have access to such "concierge teams" or any other team with representatives from the Secretary's office, Office of Nuclear Energy, or Office of General Counsel?
- A5B. The concierge team is made up of executives from the Office of Nuclear Energy, Office of the Secretary, DOE Idaho Operations Office, the DOE Office of General Counsel, and the Idaho National Laboratory.

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Q5C. Will members of these “concierge teams” participate in development or approval of any documents required under the nuclear facility authorization process?

A5C. Membership on the Concierge Team does not provide any authority or access over DOE’s safety reviewers. The Safety Approval Authority is a member of the team and privy to recommendations from the Concierge team. The Concierge team is not an organization, but may provide recommendations which support DOE authorization per the DOE-STD-1271-2025 process for DOE Authorization. As stated in sections 3 and 4 of DOE P 420.2 and DOE P 420.3, such authority remains with the Office of Nuclear Energy’s Safety Basis Approval Authority, the Assistant Secretary for Nuclear Energy, and ultimately with the Secretary of Energy.

QUESTIONS FOR THE RECORD

U.S. Senate Committee on Energy and Natural Resources

March 19, 2026 Hearing:

*The Department of Energy's Implementation of President Trump's
May 2025 Nuclear Energy Executive Orders*

Submitted to Dr. John Wagner

RANKING MEMBER MARTIN HEINRICH

Question 1:

Advanced reactor developers frequently cite manufacturing and supply chain constraints as major barriers to deploying new nuclear technologies at scale.

How can the Idaho National Laboratory's programs help accelerate innovative manufacturing for advanced nuclear technologies, including reactor components, structural materials, and advanced fuels?

Answer:

Idaho National Laboratory (INL) bridges the gap between advanced nuclear concepts and commercial deployment through multiple programs and capabilities. A key vehicle for this effort is the National Reactor Innovation Center (NRIC), established under the Nuclear Energy Innovation Capabilities Act. Through NRIC and related programs, INL enables developers to move from design to physical systems and first-of-a-kind operation, applying a “learning by doing” approach that generates the data, experience, and confidence needed to accelerate innovative manufacturing—advancing the development and qualification of reactor components, structural materials, and advanced fuels so that these technologies can ultimately be produced reliably and at scale.

INL integrates reactor demonstration, manufacturing validation, and supply chain development into a coordinated effort. The test bed facilities at INL—DOME, LOTUS, and RACE—provide developers and manufacturers with access to real operating environments where reactor systems, components, and materials can be validated under representative conditions. This is critical because manufacturers need performance data before they can justify investing in tooling, processes, and production capacity. These facilities help de-risk that investment by generating the data required for qualification, Nuclear Regulatory Commission (NRC) licensing, and eventual commercial deployment.

Under NRIC, INL is also advancing construction innovation through the Advanced Construction Technology Initiative, focused on reducing cost and schedule risk through modular construction, steel-concrete composite structures, vertical-shaft construction, and digital-engineering tools such as digital twins, innovations essential to making nuclear construction more predictable and scalable.

Advanced reactors impose extreme operating conditions—temperatures exceeding 1000°C for some designs, corrosive coolants such as molten fluoride or chloride salts or liquid metals, and high neutron fluence—that existing code-qualified structural materials, developed for light-water reactors, cannot survive reliably. To accelerate adoption of next-generation materials, INL works directly with American Society of Mechanical Engineers code committees and the NRC to establish the irradiation, corrosion, and mechanical property databases needed to qualify these materials for use—a process that can take years but is essential for commercialization. INL's Materials and Fuels Complex (MFC) supports this work through the Hot Fuel Examination Facility, which enables post-irradiation examination revealing how materials behave under neutron bombardment and extreme heat. The VULCAN initiative, described in my testimony, directly targets the materials qualification bottleneck through AI-driven discovery and high-throughput autonomous experimentation, aiming to compress qualification timelines from decades to years.

The Fuel Line Pilot Program, established under Executive Order 14302, is perhaps the most direct manufacturing accelerant. INL's role in advanced fuel manufacturing and qualification predates the Pilot Program and directly enabled it. INL partnered with BWXT in developing the manufacturing capabilities for tristructural isotropic (TRISO) fuel particles, and INL's irradiation experiments in the Advanced Test Reactor (ATR) combined with post-irradiation examinations at MFC provided the qualification data that established TRISO as a proven fuel form. That foundational work is a direct reason why so many advanced-reactor developers have selected TRISO fuel for their designs. Beyond TRISO, INL is supporting fuel-fabrication development for TerraPower's sodium-cooled fast-reactor fuel and Lightbridge's metallic fuel concepts, reflecting the breadth of advanced fuel forms that the next generation of reactors will require. Building on this experience, five companies—TRISO-X (X-energy), Oklo, Terrestrial Energy, Standard Nuclear, and Valar Atomix—now receive direct INL technical support through the Fuel Line Pilot Program to establish domestic nuclear fuel-fabrication capabilities that do not yet exist at commercial scale. INL's role extends beyond technical assistance to providing access to MFC capabilities that cannot be replicated outside a national laboratory context, effectively de-risking the manufacturing investment for each participant. With Congressional support, INL plans to add the Advanced Nuclear Fuel Fabrication Laboratory, a new capability specifically designed to bridge the gap between laboratory-scale fuel development and commercial-scale fabrication for advanced fuel forms that existing infrastructure was not built to accommodate.

The Nuclear Energy Launch Pad complements these efforts by providing developers more than 2,000 acres of dedicated demonstration site with pre-characterized infrastructure, environmental reviews, and regulatory frameworks already in place so developers can focus their resources on core technologies, rather than duplicating foundational work. This approach accelerates progress from demonstration to commercialization and, ultimately, to widespread deployment.

Taken together, these efforts position INL not just as a research institution, but as an enabler of industrialization: helping to ensure that advanced nuclear technologies can be manufactured, qualified, and deployed at the scale required to meet the nation's energy needs.

Question 2:

Idaho National Laboratory has served as the nation's lead laboratory for nuclear fuel cycle research and development. Fuel cycle management—including recycling, reprocessing, and advanced waste management technologies—are of deep interest to my state of New Mexico, as the nation's only home of a geological repository for nuclear waste.

What current research programs at INL are focused on advanced fuel recycling and reprocessing technologies?

Answer:

INL leads the nation's development and demonstration of advanced nuclear fuel-recycling technologies, spanning aqueous and electrochemical processing approaches. A major current emphasis is on simplified processes with reduced plant costs and integrated safeguards: technologies that do not separate pure plutonium to minimize proliferation risk while recovering valuable materials from used fuel and significantly reducing the volume of waste that requires permanent disposal. INL also leads the development and implementation of advanced safeguards and security approaches applicable to advanced recycling technologies and associated reactor designs.

Two of INL's most-consequential active programs directly address the nation's near-term need for domestic high-assay, low-enriched uranium (HALEU) supply. At MFC, INL's Fuel Conditioning Facility (FCF) produces HALEU by pyrochemically processing used fuel from the Experimental Breeder Reactor II (EBR-II). EBR-II operated at INL for 30 years and generated an inventory of used sodium-bonded metallic fuel. The FCF's electrochemical process dissolves this used fuel in a molten-salt bath, selectively recovering uranium while leaving fission products and transuranic elements behind. The recovered uranium is then downblended to HALEU enrichment levels, providing a critical domestic supply bridge while commercial HALEU production capabilities are established. This is not a laboratory experiment; it is an active, ongoing operation producing real material for advanced-reactor programs.

Complementing this work, INL developed the Zirconium Extraction (ZIRCEX) process to recover highly enriched uranium (HEU) from a different category of used fuel: zirconium- and aluminum-clad fuels from INL's own research reactors and other sources across the Department of Energy (DOE) complex. ZIRCEX uses hydrogen-chloride gas to react with and volatilize the zirconium or aluminum cladding, removing it from the fuel and liberating the HEU material for recovery and subsequent downblending to HALEU. Because ZIRCEX removes cladding through a gas-phase chemical reaction, rather than aqueous dissolution, it generates significantly less liquid waste than conventional aqueous decladding processes—an important advantage for minimizing the volume of secondary waste requiring disposal.

Building on these active production programs, INL conducts a broad portfolio of fuel-cycle research and development. INL leads DOE's Office of Nuclear Energy Materials Recovery and Waste Forms Campaign, performing applied research on advanced fuel-cycle technologies including the development of advanced recovery methods, such as the ZIRCEX process mentioned above, for high-value aluminum-based fuel discharged from INL's ATR. INL also advances the development and performance demonstration of advanced waste forms derived from pyrochemical and aqueous reprocessing secondary wastes, a critical complement to recycling that addresses the back end of the fuel cycle.

INL's private-sector partnerships further extend the reach of these capabilities. Current partnerships include direct collaboration with Quadrant Nuclear Industries on advanced used-fuel recycling techniques including ZIRCEX; demonstration of Curio's NuCycle reprocessing technology under the Advanced Research Projects Agency–Energy (ARPA-E) Converting Used Nuclear Fuel Radioisotopes Into Energy (CURIE) program, a Gateway for Accelerated Innovation in Nuclear voucher, and direct partnership; advancement of Oklo's pyrochemical reprocessing process through the ARPA-E Optimizing Nuclear Waste and Advanced Reactor Disposal Systems program and direct partnership; an ARPA-E award to Project Omega and INL to advance used nuclear fuel recycling; and a recent award supporting the development of hydroprocessing of used fuel with Shine Technologies, LLC.

To deliver on these research programs and the needs of industry partners, INL operates a suite of unique test-bed capabilities at MFC. Current and upcoming facilities include:

- **FCF**

This facility supports DOE nuclear energy programs and fuel-cycle test beds by applying pyrochemical processing to treat used advanced-reactor fuels. Its heavily shielded hot-cell infrastructure enables remote handling of radioactive materials and advances research in fuel-cycle technologies and waste management.

- **Scalable Pyrochemical Recycling**

This test bed supports actinide recovery and recycling from used fuel using pyrochemical flowsheets. It includes an input accountancy capability with a crusher for particle-size reduction and a riffler for representative sampling of heterogeneous fuel mixtures.

- **Moran Test Bed**

This pilot facility, with skid-mounted unit operations, is representative of an aqueous reprocessing plant. The Moran test bed can process depleted or natural uranium along with trace fission products for fuel cycling and nonproliferation R&D, and provides valuable training on aqueous-reprocessing technologies.

- **Beartooth Test Bed**

INL is deploying a new capability for nuclear-material processing and recycling, material monitoring and characterization, modeling and simulation, and data science. Beartooth is a glovebox processing capability that handles enriched uranium, plutonium, thorium, and minor actinides and is designed for flexible unit operations. It allows a variety of aqueous flowsheets to be studied.

- **Molten Salt Thermophysical Examination Capability (MSTEC)**

MSTEC is a state-of-the-art shielded argon glovebox for irradiated and non-irradiated salts containing actinide materials, offering a suite of thermophysical-property characterization equipment, multifunctional furnaces, and versatile workspaces for lab-scale experiments.

- **Material Recovery Pilot Plant (MRPP)**

MRPP's capabilities support engineering-scale evaluations of chemical decladding processes using full-scale surrogate fuels across several different technology approaches.

The Nuclear Energy Launch Pad, announced by DOE in March 2026, builds on the foundation established by the reactor and fuel pilot programs. Launch Pad provides a formal mechanism for technology developers, including those pursuing advanced recycling and reprocessing, to site pilot-scale facilities and access expertise across the DOE complex, accelerating the development and demonstration of advanced fuel-cycle technologies consistent with the nation's growing need for a closed domestic fuel cycle.

Question 2b:

How can Congress aid in accelerating private-sector led research, testing, and demonstration for advanced fuel recycling technologies?

Answer:

Congress can accelerate private-sector led research, testing, and demonstration of advanced fuel-recycling technologies by providing clear policy direction and targeted financial support that reduces investment risk and enables access to critical infrastructure. This includes explicitly affirming Congressional support for fuel recycling as part of the U.S. fuel-cycling strategy, supporting a DOE-led Fuel Recycling Pilot Program to demonstrate technical and economic viability, and ensuring private developers have access to DOE materials, facilities, and expertise needed for testing and scale-up.

Modernizing the Nuclear Waste Policy Act would further provide a durable policy framework that recognizes the role of recycling in employing the remaining energy potential in used nuclear fuel, reducing waste volumes, and improving disposal pathways, thereby strengthening the business case for private investment. Congress can also enhance such existing financial mechanisms as loan guarantees and cost-sharing programs to better support fuel cycle projects, which often require multiple partnerships and phased demonstration approaches.

Finally, DOE's ongoing Nuclear Lifecycle Innovation Campus Request for Information highlights growing state and industry interest in co-locating infrastructure and sharing costs, underscoring the importance of sustained Congressional support for collaborative models that enable private-sector participation in fuel-recycling technology development.

SENATOR MAZIE K. HIRONO**Question 1:**

How is the Idaho National Laboratory (INL) verifying that the reactor pilot program projects comply with established standards for quality assurance to provide confidence that they will be safe to operate?

Answer:

The Reactor Pilot Program projects operate under DOE authorization, implemented via the appropriate DOE orders and standards. Under this framework, each Pilot Program participant is required by the DOE to select an industry-appropriate quality-assurance (QA) standard, ensuring that the rigor of the QA requirements is commensurate with the technology and associated hazards.

It is important to note that INL typically does not directly verify the quality of the Reactor Pilot program projects, with some exceptions for projects located within existing INL facilities. Instead, these pilot projects are directly managed by DOE Office of Nuclear Energy site offices (for example, DOE's Idaho Field Office [DOE-ID]) via contracts. In this example, DOE-ID retains responsibility for quality oversight and regulation. INL (through its contractor, BEA) has, upon request by pilot-program participants, assisted with the performance of quality audits and surveillances. This support is provided through cooperative research and development agreements or strategic partnership project agreements with the respective pilot program participants.

Question 2:

What process is the INL using to verify that the test reactors are built in accordance with their authorizations? Who is conducting construction and pre-operation inspections? Who will be inspecting operations?

Answer:

Oversight is conducted through DOE's own regulatory authorities and staff. For INL specifically, the DOE-ID maintains oversight responsibility for nuclear facilities on the INL site.

Within this structure, INL maintains a rigorous, multi-layered process to ensure that test reactors are designed, constructed, and ultimately operated in full accordance with their DOE authorizations. This process is established in the New Reactor Developer Program Guide (GDE-55157), which establishes the phased life cycle and INL's acceptance and oversight responsibilities and the Quality Requirements Interface Agreement (IAG-1151), which establishes how INL flows down and verifies quality requirements for reactor partners. Together these guides define INL's acceptance, verification, and oversight responsibilities.

SENATOR CATHERINE CORTEZ MASTO

Question 1:

Is there an update on how National Labs are working with DOE and the Administration to support the EO's workforce initiatives? Are there opportunities to expand existing programs and partnerships with Colleges and Universities, or a need to develop new programs?

Answer:

National laboratories, including INL, continue to work closely with DOE and the Administration to advance the workforce-related priorities outlined in recent executive orders. This includes strengthening partnerships with universities, community colleges, workforce-development organizations, and federal education and research programs to ensure the nation can meet long-term workforce needs across research, operations, trades, and emerging-technology fields.

INL maintains strong engagement with higher-education institutions through DOE's Nuclear Energy University Programs. Building on this foundation, the lab also leverages a network of strategic university partnerships. These partnerships create durable pathways for joint research, student training, and faculty collaboration, and they broaden participation across a wide set of institutions, including those in historically underfunded states.

DOE's updated Established Program to Stimulate Competitive Research (EPSCoR), expanded by the CHIPS and Science Act, further strengthens research capacity at universities in underrepresented states. The program now supports community colleges and tribal colleges, enabling broader participation across the educational spectrum. Increased coordination between EPSCoR institutions and national labs helps to build regional research ecosystems and expand opportunities to align nuclear workforce development with local deployment plans, including reactor siting, fuel-cycle facilities, and manufacturing.

INL leverages robust early-career initiatives—most notably its internship program, which hosts more than 500 students each year—to intentionally cultivate the next generation of talent in critical national research domains. By providing hands-on experience in nuclear science, cybersecurity, artificial intelligence, and advanced materials, these programs not only strengthen the pipeline of highly skilled professionals, but also ensure that INL continuously develops a workforce aligned with its mission and future needs. This early engagement accelerates students' technical growth, builds long-term talent relationships, and reinforces INL's role as a leader in preparing the scientific and engineering workforce of tomorrow.

Through enhanced regional collaborations, INL has been integral in driving systemic workforce development programming to ensure the nuclear industry has the skilled workforce it needs, when it needs it. Including the launching of the Battelle Energy Alliance Applied STEM Institute at the College of Eastern Idaho's (CEI's) first-of-its-kind applied and industry embedded science, technology, engineering, and math (STEM) acceleration engine. INL's critical partnerships with CEI on radiological controls technician training and Idaho State University's Energy Systems Technology and Education Center supporting the expanded nuclear operator and nuclear facility technician programs. INL supports new program development, including the creation of the nuclear-technician program at Western Wyoming Community College and the development of the nuclear-informed trades programming through the Intermountain-west Nuclear Energy Corridor Tech Hub, as designated by the U.S. Department of Commerce.

Meeting the nation's future needs requires a holistic, K-through-career approach. This includes early STEM exposure for K–12 students; embedded and applied STEM programming, strong associate, undergraduate, graduate, and postgraduate programs; including transfer pathways, hands-on training at facilities that replicate real nuclear systems; and clear on-ramps for trades, crafts, technicians, and STEM-adjacent roles essential for deployment and operations.

Sustained and enhanced federal investment is essential across this entire pipeline. Key needs include continued support for university nuclear-engineering and materials-science programs; expansion of DOE's academic partnerships; additional robust funding for community-college nuclear technology, chemical-engineering technology, construction trades, and manufacturing and fabrication programs; and structured pathways to transition nuclear-Navy veterans into civilian careers. Additionally, long-term increased investment is needed to strengthen pre-college STEM initiatives, DOE's Workforce Development for Teachers and Scientists programs, and related frameworks that anchor high-capacity research and training partnerships nationwide.

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Questions for the Record from Ranking Member Martin Heinrich

Question 1: Kairos Power has a partnership agreement with the Department of Energy to demonstrate your first-of-a-kind reactor at the Oak Ridge National Laboratory, and a partnership with Los Alamos for initial fuel fabrication.

Can you briefly explain how access to the national labs is helping to accelerate your company's deployment of new advanced reactors?

Response:

Kairos Power values the opportunity to collaborate with the national laboratories to support the commercialization of our fluoride salt-cooled high-temperature reactor (KP-FHR). Direct engagement with the national labs unlocks access to skilled expertise, world renowned facilities and supports validating first of a kind technologies and advanced manufacturing capabilities that would not be possible without direct collaborations with the national labs. These engagements have directly contributed to our ability to progress faster and reduce costs for future deployments.

To support the development of our technology, Kairos Power is partnering with Los Alamos National Laboratory (LANL) in New Mexico to produce TRISO fuel pebbles for the Hermes Low-Power Demonstration Reactor (Hermes 1) at the Low-Enriched Fuel Fabrication Facility (LEFFF). This synergistic partnership combines Kairos Power's expertise in fuel manufacturing with LANL's ability to realize the first nuclear iteration in Kairos Power's fuel development strategy. Building off our recent agreement with DOE to provide Kairos Power with High-Assay Low-Enriched Uranium (HALEU), that material will be turned into TRISO and then be the basis for our fuel production at LEFFF.

At Kairos Power's Reactor Demonstration Campus in Oak Ridge where construction has started on Hermes 1, work on innovative precast and cast-in-place construction techniques have made significant progress in collaboration with the Oak Ridge National Laboratory (ORNL). With assistance from ORNL's Manufacturing Development Facility (MDF), which has previous experience in 3D-printed technologies and creating digital tools to qualify instruments and manufacturing processes, the company is now applying these efforts to nuclear construction by developing advanced 3D-printed polymer composite forms to expedite construction timelines for reactor shielding. Utilizing the expertise and specialized equipment at MDF, Kairos Power is able to validate this cast-in-place construction technique for our demonstration project. Building on this partnership, Kairos Power is utilizing ORNL's specialized research infrastructure to accelerate TRISO pebble development, spent fuel planning, and the deployment of advanced manufacturing for remote maintenance. Our work with ORNL will directly support our ability to commercialize this technology.

Kairos Power also collaborates with Sandia National Laboratory, Idaho National Laboratory and Argonne National Laboratory.

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Question 2: Critical minerals, especially those that are in short supply or lack of production in the US, are a real focus as we try to lessen our reliance on foreign sources.

Are there any critical minerals essential to advanced nuclear that need a domestic supply chain stood up?

Response:

Lithium-7 is a critical mineral that is essential to the nuclear industry. Kairos Power's reactor uses a high-purity molten fluoride salt coolant known as Flibe which is a mixture of lithium fluoride and beryllium fluoride salts. Utilizing Flibe enhances our safety profile because it is chemically stable, has low volatility and high thermal capacity, a strong affinity for fission products, and allows the reactor to operate at near-atmospheric pressure. Flibe cannot be created without access to high-purity lithium-7 which comes from enrichment of natural lithium. Kairos Power recognized this serious supply chain risk soon after its founding and developed its own proprietary lithium-7 enrichment process. Construction of the Lithium Salt Production Facility in Albuquerque, New Mexico should be complete by mid-2026.

This critical mineral is also utilized by the operating pressurized-water reactor (PWR) fleet. PWRs rely on lithium-7 as a pH control to prevent cooling pipe corrosion. Since the 1960s, there has not been a domestic supply of enriched lithium-7 and without a domestic supply chain the U.S. is dependent on foreign suppliers like Russia. The current stockpiles of this material are slated to run out by the early 2030s. The new Kairos Lithium Salt Production facility is expected to meet both the advanced reactor needs and the current PWR fleet.

Question 3: Does your company have access to the fuel you need to be successful in deploying and rapidly commercializing new reactors?

Where should the federal government focus efforts and resources to build up the domestic fuel supply chain expeditiously?

Response:

In January 2026, Kairos Power and the Department of Energy finalized a contract to provide high-assay low-enriched uranium (HALEU) for the startup and operation of the company's Hermes Low-Power Demonstration Reactor (Hermes 1) under the Department's HALEU Availability Program. This allocation will be used to produce TRISO fuel pebbles for Hermes 1 in partnership with the Los Alamos National Laboratory's Low-Enriched Fuel Fabrication Facility (LEFFF), to enable the success of the company's future commercial fleet. Kairos Power has received only a small portion of the agreed-upon amount and does not have line of sight when the company will receive the remainder of it.

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Kairos Power and BWX Technologies (BWXT) announced an agreement to collaboratively explore potential opportunities to deliver fuel for the Hermes 2 Demonstration Plant and subsequent commercial reactor deployments. Under the collaboration agreement, the joint team will explore opportunities to utilize the state-of-the-art TRISO Development Lab (TDL) at Kairos Power's Albuquerque campus, the BWXT Innovation Campus in Lynchburg, Virginia, and BWXT's existing TRISO production line.

Kairos Power appreciates the support and initiative Congress and the Department have taken to increase fuel supply and support industry efforts on expanding fuel manufacturing infrastructure. Kairos Power looks forward to engaging further with Congress on ways to support commercial fuel manufacturing capabilities. The recent domestic enrichment awards, totaling \$2.72 billion, are a good start but much more is needed, with a particular focus on standing up HALEU production. In conjunction with direct support for the domestic fuel supply chain, Congress should also facilitate direct partnerships with Canada and Australia to provide access to their vast uranium reserves for American nuclear fuel and reactor developers.

Question 4: With the growing demand for new generation, mostly driven by data centers and artificial intelligence, how is nuclear a more sustainable option for baseload power to support advancements in new technology?

Response:

Nuclear energy offers a more sustainable baseload power solution when considering both its operational capabilities and full lifecycle analysis. Nuclear energy is a source of reliable, 24/7 baseload power that emits zero carbon emissions. The physical structures surrounding a nuclear reactor are built to withstand strong tornado winds, pervasive flooding, earthquakes, and other natural disasters or potentially damaging external factors. This combined with nuclear power plants' on-site fuel advantage helps negate the possibility of pipeline delivery and transportation interruptions caused by adverse weather conditions, making it one of the most reliable, weather-hardened energy production sources. Nuclear power plants have a remarkably high-capacity factor, meaning they operate at full power nearly all the time due to the fuel utilized in a nuclear reactor being incredibly energy dense. For comparison, Kairos Power's reactors are fueled by TRISO fuel pebbles and one golf ball-sized TRISO pebble has the same energy output as four tons of coal. This energy density and the safety of the fuel, which DOE has called the most robust nuclear fuel, combined with the inherent safety of new cooling technologies significantly reduce water use and allows a much smaller physical footprint for advanced reactor power plants compared to conventional nuclear. Nuclear energy provides superior price stability because its cost structure is largely insulated from fuel market volatility. Unlike fossil fuel generation, where fluctuating coal, gas, and oil prices dictate a significant portion of the consumer's bill, fuel costs represent only a small fraction of nuclear's operating expenses. This decoupling protects ratepayers from the 'uncertainty tax' of global energy spikes, ensuring more predictable and standard electricity pricing.

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Questions for the Record from Senator Alex Padilla

Question 1: In your testimony you describe Kairos as a case study in a new development model for advanced reactors built around DOE's milestone-based, fixed-price funding for Hermes. How can such funding models, or other innovative federal funding support, accelerate reactor development and deployment?

Response:

Strategic government investments that align with private industry will accelerate Kairos Power's ability to go from demonstration to deployment. Like the position the National Aeronautics and Space Administration (NASA) implemented in the Commercial Orbital Transportation Services (COTS) program, milestone-based contracts support companies in development by investing in the outcome rather than the product.

In February 2024, Kairos Power and the Department of Energy signed a Technology Investment Agreement (TIA) that will provide up to \$303 million to Kairos Power following a performance-based, fixed-price milestone approach. Under the agreement, the company will only receive pre-negotiated payments upon demonstrating the achievement of project milestones, meaning the company is only paid for results, not work. Kairos Power believes milestone-based contracting should become the standard for strategic government incentive programs seeking to bring innovative technologies to commercialization. This fiscally responsible approach means that companies have real skin in the game because they will bear upfront risk and absorb financial responsibility for any work required to complete a milestone. Through milestone-based contracts, companies are incentivized to create efficiency, drive rapid performance, and establish credibility to deliver a safe and affordable commercial technology by reducing the need for detailed government project management and accounting, fostering transparency throughout the project's lifecycle, and allowing project leaders to nimbly adjust to any unforeseen circumstances. This novel approach rewards progress by releasing fixed payments to companies and putting the Government into the role of an investor. To reiterate, the U.S. taxpayer pays nothing until milestones are achieved, lowering the risk of supporting potential unsuccessful projects.

Question 2: Our global competitors, particularly China and Russia, are moving at speed to develop and deploy advanced reactor technology. If you had to name the single biggest remaining bottleneck where congressional action could be most direct in accelerating U.S. deployment relative to our competitors: is it fuel supply, regulatory timelines, financing, or something else?

Response:

In our experience the single largest barrier to deployment of advanced reactor technology relative to our global competitors is the certainty of financing, with a reliable fuel supply as a close second.

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Kairos Power is mitigating these risks by taking a novel approach to nuclear development. We are vertically integrated to ensure supply chain issues do not constrain our progress. For example, Kairos Power is developing in-house fuel fabrication techniques in collaboration with the national labs and the Department of Energy for our first fuel load for the Hermes Low-Power Demonstration Reactor.

While the path to an advanced reactor fleet deployment is complex, Kairos Power has been able to steadily move towards supporting the U.S.'s energy demands. China and Russia have invested massive amounts of resources in expediting the construction of nuclear power plants, improving their ability to rapidly deploy new technology. In order to keep the current momentum moving forward for advanced reactor developers, the U.S. Government needs to continue unlocking opportunities to finance projects. Creating an all-of-government approach, establishing consistent funding streams with investment dependent on demonstrated progress and a milestone basis, would help enable commercial pathways.

As these new technologies mature from demonstration to deployment, financing mechanisms are needed to bridge the gap. Expanding upon existing programs, like the Advanced Reactor Demonstration Program (ARDP), will ensure companies like Kairos Power can make first-of-a-kind technology commercially viable. Congress should also make sure that sustained funding for innovative technologies is milestone-based so that it incentivizes real progress, which will accelerate commercialization and ultimately lessen the reliance on federal funding. Also creating opportunities for direct foreign investment and continuing to find efficiencies in licensing will help lower costs and improve deployment timelines.

Question 3: Kairos has received two construction permits from NRC for Hermes 1 and Hermes 2. What are the advantages of pursuing a license through NRC compared to pursuing DOE authorization?

Response:

At the time Kairos Power initiated and submitted its construction permit application, the DOE authorization pathway did not exist as an available option. As a result, pursuing NRC licensing was not only the most appropriate path for long-term commercialization, but also the only regulatory pathway at the time.

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Questions for the Record from Senator Catherine Cortez Masto

Question 1: Can you summarize some of the workforce programs that Kairos Power has initiated?

Response:

Kairos Power is helping to build a robust nuclear workforce across the regions where we operate by actively partnering with universities, community colleges, and trade schools to create career pathways into the nuclear sector. Kairos Power is providing hands-on training at our facilities through internships, co-ops, and early-career programs. Kairos Power is proud of the strong partnerships we have built and appreciates the opportunity to highlight our effort. Below represents a non-exhaustive list of our workforce development:

- University Partnerships:
 - o Central New Mexico Community College (CNM)
 - Through our engagement with CNM, we have hired skilled graduates from technical programs to support our manufacturing capabilities at our facility in New Mexico.
 - o University of Tennessee:
 - Kairos Power opened a new Operator Training Simulator Laboratory in partnership with the University of Tennessee in Knoxville. Kairos Power is supplementing the simulator-based training with introductory courses on nuclear fundamentals open to both Kairos Power employees and university students. The foundational course offerings will provide industry-relevant education for emerging professionals exploring careers in advanced nuclear outside the conventional engineering pathway.
 - o Tennessee Colleges of Applied Technology (TCAT) Campuses:
 - Technicians on our Pre-Commission, Install, Test, and Assemble (PITA) team are engaging with TCAT to advise on programs for instrumentation, electrical, and mechanical technician training.
- Other Workforce Development Engagement:
 - o Kirtland Air Force Base:
 - Kirtland AFB is a strategic partner, providing a pipeline of highly skilled, mission-driven individuals transitioning to civilian roles. We participate in their career fairs to introduce servicemembers to civilian career opportunities at our facility, particularly in technical roles that leverage their military training and expertise.
 - o New Mexico's Economic Development Department's Job Training Incentive Program (JTIP):
 - JTIP funds classroom and on-the-job training for newly created jobs for expanding or relocating businesses. This program reimburses 50-90% of employee wages for eligible jobs that meet strict requirements.

Deep Fission Testimony for the Record
Senate Committee on Energy and Natural Resources
Full Committee Hearing to Examine the Department of Energy's Implementation of President
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March 19, 2026

Chairman, Ranking Member, and distinguished Members of the Committee: Thank you for the opportunity to submit this testimony. My name is Liz Muller and I am the CEO and Co-Founder of Deep Fission we are a pioneering advanced nuclear energy company headquartered in Berkeley, California, currently working to deploy our first reactor at the Great Plains Industrial Park in Parsons, Kansas. Deep Fission was founded in 2023 by myself and my father Dr. Richard Muller a physicist and entrepreneur whose previous work on deep borehole technology laid the conceptual groundwork for what we are building today. Our team comprises seasoned scientists, engineers, and energy experts united by a single mission: to deliver safe, reliable, and affordable nuclear power at scale

Deep Fission is developing our Gravity Nuclear Reactor, which is a nominally 15 MWe small modular pressurized water reactor (SMR) installed one mile underground inside a borehole. Our approach is deliberately built upon proven, de-risked components rather than speculative next generation materials:

- A standard pressurized water reactor (PWR) the same technology that has safely powered the U.S. Navy's fleet for decades and generates the majority of America's commercial nuclear electricity today.
- Deep borehole drilling techniques developed and proven over decades by the oil and gas industry
- Geothermal heat transfer processes that reliably move thermal energy from depth to a surface turbine generator.

By placing the reactor one mile underground, the surrounding geology provides passive shielding and natural containment eliminating the need for costly above ground megastructures. Hydrostatic pressure from the water column at that depth provides 160 atmospheres of reliable, natural pressure no pumps, no external power required. This approach allows Deep Fission to use off the shelf components and existing supply chains, with fuel from standard low enriched uranium (LEU). In December 2025, we broke ground at the Great Plains Industrial Park in Parsons, Kansas. In March 2026, we commenced drilling the first of three planned boreholes, a milestone that represents the shift from concept to construction. We have secured an \$80 million financing round, signed a domestic uranium fuel agreement with Urenco USA, and hold letters of intent representing approximately 12.5 gigawatts of potential future power demand. We are in direct alignment with the goals set forth in the President's executive orders.

On May 23, 2025, President Trump signed four executive orders representing what his Administration has correctly characterized as the most consequential reforms to nuclear energy policy in decades. Together, they chart an ambitious course to quadruple U.S. nuclear generating capacity from approximately 100 gigawatts today to 400 gigawatts by 2050. Deep Fission strongly supports this vision and is actively participating in its implementation. The four executive orders address four critical pillars of nuclear energy revitalization:

- Modernizing the Nuclear Regulatory Commission (NRC) to eliminate decades of bureaucratic delay and mandate timely final decisions on reactor applications.
- Reforming nuclear reactor testing at the Department of Energy including the establishment of the Reactor Pilot Program under which Deep Fission operates.
- Deploying advanced nuclear reactor technologies for national security, including AI data centers and military installations.
- Reinvigorating the nuclear industrial base through domestic fuel supply chain development, workforce investment, and the restoration of American nuclear manufacturing.

Of particular significance to Deep Fission is Executive Order 14301, which directed the Department of Energy to establish a Reactor Pilot Program enabling construction and testing of advanced reactors outside of national laboratories under DOE oversight, but on commercial and industrial sites. This represents a fundamental policy innovation. Deep Fission was selected as one of ten companies to receive support under this program. In November 2025, we signed an Other Transaction Agreement (OTA) with the DOE, establishing the legal and operational framework for our pilot reactor at Parsons, Kansas. The program creates clear pathways for design review, safety analysis, construction, and initial operations with an expedited licensing framework explicitly designed to help first of a kind technologies demonstrate their performance in the real world.

DOE's implementation of these executive orders has been substantive and consequential. In the months since the orders were signed, the Department has made conditional HALEU fuel commitments to advanced reactor developers, awarded \$800 million to TVA and Holtec to advance domestic SMR deployment, announced a \$2.7 billion investment in domestic uranium enrichment, and provided the \$1 billion loan backing the Crane Clean Energy Center restart in Pennsylvania. These are not symbolic gestures they are structural investments in rebuilding American nuclear capacity.

The committee should understand a fundamental economic reality about nuclear energy: the path from demonstrated technology to deployed commercial power plant is historically the most capital intensive and uncertain phase of any energy technology. It is precisely here between a successful pilot and full commercial deployment that promising technologies have repeatedly stalled. Federal support at this juncture is not a subsidy in the traditional sense. It is a de-risking investment that unlocks enormous private capital flows and ultimately delivers a self-sustaining commercial industry. Without federal support through even successful pilot programs can fail to achieve commercial scale. The history of American energy technology from wind and solar to natural gas combined cycle plants shows that government investment in demonstration and early commercialization consistently produces returns that dwarf their initial costs, in the form of domestic industry, jobs, tax revenues, and energy cost reductions for consumers and businesses alike.

The economic case for aggressively supporting advanced nuclear commercialization is compelling and multidimensional. Energy cost and reliability: Deep Fission's target LCOE of 5 to 7 cents per kilowatt-hour is competitive with the cheapest forms of generation in America today and unlike solar and wind, it is fully dispatchable. American manufacturers, data centers, hospitals, and military bases that rely on consistent, uninterruptible power would benefit directly from access to small, deployable, cost competitive nuclear generation. The DOE has estimated that without a dramatic expansion of reliable generation, blackout risk could increase a hundredfold by 2030.

Jobs and industrial revitalization: Advanced nuclear manufacturing draws on the same skilled workforce as traditional energy and heavy industry welders, machinists, drillers, and engineers concentrated in the American heartland. Deep Fission's Kansas pilot project is already seeking to create jobs in Labette County. Full commercial deployment of Deep Fission's technology across our current 12.5 GW potential pipeline would potentially represent a multi-decade, multi-billion-dollar investment in American communities.

The executive orders rightly direct DOE to rebuild domestic uranium conversion, enrichment, and fuel fabrication capacity. Deep Fission's recent fuel agreement with Urenco USA is a direct example of this policy working as intended establishing domestic supply chains that reduce dependence on foreign sources, create American jobs, and strengthen our long-term energy security. Each additional advanced reactor deployment further strengthens the commercial viability of these supply chains, building a self-reinforcing cycle of domestic nuclear industrial capacity.

The United States is today losing the global nuclear market to Russia and China. Eighty-seven percent of new reactor builds worldwide are based on foreign designs. Every advanced reactor that Deep Fission deploys domestically strengthens the commercial track record required to compete internationally. The executive orders' direction to the Secretary of State to pursue at least twenty new Peaceful Nuclear

Cooperation agreements reflects an understanding that American nuclear technology exports carry geopolitical weight far beyond their commercial value.

Moreover, the committee should view advanced nuclear energy not merely as an energy policy question, but as a strategic national security priority. The President's executive orders make this connection explicitly, and we believe that Deep Fission's technology is uniquely positioned to serve the national security missions they describe. America's military installations, intelligence facilities, and critical defense infrastructure face a growing vulnerability: dependence on centralized electrical grids that are increasingly subject to cyber attacks, physical sabotage, extreme weather events, and adversarial disruption. The executive orders direct the Department of Defense to deploy nuclear reactors at domestic military installations a recognition that assured, resilient, on site power is a military capability, not merely a utility service.

Deep Fission's underground Gravity Reactor is uniquely suited for this mission. Its inherent physical security buried one mile below the surface, with a minimal above ground footprint makes it highly resistant to conventional attack, electromagnetic pulse, and physical sabotage. Its modular, standardized design enables rapid deployment at multiple sites. Its use of standard LEU fuel, sourced domestically, eliminates foreign supply chain dependencies. The same characteristics that make it economically attractive for commercial power generation make it operationally attractive for defense energy applications.

The executive orders also recognize an emerging national security challenge that is reshaping the energy landscape in real time: the explosive growth of artificial intelligence computing infrastructure. AI data centers require vast quantities of reliable, continuous, high-density power exactly the operational profile that nuclear generation is uniquely designed to serve. The executive orders' designation of AI data centers at DOE facilities as critical defense facilities, and the directive to deploy advanced nuclear reactors to power them, reflects an understanding that AI capability is itself a national security asset.

Deep Fission's modular, underground reactor design is well suited for co-location with data centers and other sensitive infrastructure. Its compact surface footprint, inherent physical security, and reliable baseload output make it an ideal power source for facilities that cannot tolerate interruption. Federal support for rapid commercialization of technologies like Deep Fission's directly advances the AI and critical infrastructure security goals articulated in the executive orders.

Deep Fission respectfully requests the Committee's support for the following specific actions, each of which is critical to realizing the objectives of the President's executive orders and ensuring that the United States leads the next era of nuclear energy:

- **Fully fund the DOE Reactor Pilot Program and its associated support infrastructure. The program's success depends on sustained, predictable federal investment. Appropriations that match the ambition of the executive orders are essential.**
- **Support expedited NRC licensing pathways for technologies that have successfully completed DOE pilot demonstrations. The connection between a successful DOE pilot and streamlined NRC commercial licensing must be made explicit and operational, not merely aspirational.**
- **Prioritize advanced nuclear in DOE Loan Programs Office activities. The Loan Programs Office has a critical role to play in bridging the financing gap between successful demonstration and first commercial deployment precisely the phase where private capital is most scarce and federal de-risking is most valuable.**
- **Support export promotion and 123 Agreement expansion as directed by the executive orders. Congress can reinforce executive branch diplomatic efforts by ensuring that export financing tools, export control streamlining, and multilateral development bank engagement are adequately resourced and staffed.**

• Sustain bipartisan commitment to nuclear energy across administrations and congresses. The multidecade investment cycles required for nuclear energy development demand policy stability. The executive orders' goals can only be achieved if Congress provides durable legislative and appropriations backing that survives political transitions.

Deep Fission stands at a pivotal moment. We have moved from concept to construction. We are drilling. We are building. We have fuel. We have the technology, the team, and the tenacity to demonstrate something that has never been done before and to do it on the timeline the President's executive orders demand.

The policy framework established by the May 2025 executive orders and implemented by the Department of Energy is the right framework. It creates the regulatory pathways, and the national security alignment that advanced nuclear technologies need to move from promising pilot programs to deployed commercial assets. What is needed now is sustained congressional support to ensure these policies are fully funded, fully staffed, and durably anchored in statute.

The stakes could not be higher. America's energy security, economic competitiveness, national security, and geopolitical leadership in the twenty first century will be shaped, in significant part, by decisions made in this Congress about whether to fully embrace the nuclear energy renaissance that is now, for the first time in decades, genuinely within reach.

Deep Fission is proud to be at the forefront of that renaissance. We are grateful for the Committee's attention, and we welcome any questions.

Respectfully submitted,

Liz Muller
CEO, Deep Fission, Inc.
www.deepfission.com

UNITED STATES SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

WRITTEN TESTIMONY

Submitted for the Record

HEARING ON:

**"Executing on America's Nuclear Energy Dominance:
Federal Sites, Near-Term Deployment, and the Imperative
of American-First Development"**

Submitted by:

Gregory A. Forero
Founder and Chief Executive Officer
HGP Intelligent Energy LLC
Dallas, Texas

Senate Committee on Energy and Natural Resources
March 2026

I. INTRODUCTION AND SUMMARY POSITION

Chairman and distinguished Members of the Committee: I am Gregory A. Forero, Founder and Chief Executive Officer of HGP Intelligent Energy LLC, a Dallas-based nuclear energy development company. I submit this testimony in strong support of President Trump's Energy Dominance agenda. My request is straightforward: that the federal nuclear site deployment process maintain the same momentum the administration has generated elsewhere, ensuring American operators, American technology, and American workers lead the nuclear renaissance this Committee has long championed.

President Trump is correct—energy dominance is a national security imperative, not mere rhetoric. The United States has the technology, statutory authority, federal land, and private-sector capacity to deploy near-term nuclear power on domestic soil now—not in 2031, not after another decade of reviews, but today. HGP Intelligent Energy exists to make that happen.

The Department of Energy has shown real progress under this administration: the Japan nuclear cooperation framework, enrichment awards, Crane and Palisades restarts, and the Reactor Pilot Program are tangible steps forward. HGP strongly supports this entire agenda.

My testimony does not question that progress. It respectfully urges that the same sense of urgency apply to the federal site deployment process—particularly the RFP and RFO processes to which American developers, including HGP, responded in good faith and which have since gone quiet. The May 2025 Executive Orders were a clear mandate. This Committee can ensure all aspects of that mandate, including near-term deployment on existing federal sites by American operators, advance with equal priority alongside international efforts.

I appreciate Ranking Member Heinrich's emphasis at this hearing on open, merit-based, and transparent processes for federal nuclear deployment—a principle shared across party lines and exactly what HGP seeks to uphold.

II. WHO WE ARE: THE COREHELD PROJECT

HGP Intelligent Energy rests on a simple, powerful foundation: the United States Navy has perfected the world's most reliable nuclear reactor technology over decades. It powers carriers and submarines without a single failure in service. It is the most proven reactor technology in existence. Under the Atomic Energy Act, DOE holds existing statutory authority to authorize civilian use of this technology on federally controlled land—a pathway supported by more than six decades of operational precedent.

The CoreHeld Project deploys this naval-derived technology for civilian power generation on DOE sites (Phase One) and scales it with new naval-specification reactors that double as strategic energy reserves for military readiness and DoD energy security (Phase Two). This is dual-use national security infrastructure by definition.

HGP submitted formal responses to the Oak Ridge and Paducah solicitations. We engaged DOE's Office of Technology Commercialization (OTC) with substantive encouragement, secured Congressional support, developed a capital strategy, and assembled a team including former senior federal nuclear officials. We are not theoretical; we are prepared to build.

Our request is simple: complete the federal site process DOE initiated so American developers can move forward on merit.

III. KEEPING PACE: DOMESTIC DEPLOYMENT AND THE MAY 2025 MANDATE

We do not question DOE's integrity or the demands of its multi-front agenda. The enrichment awards, Oak Ridge land transfers, and Japan framework reflect serious commitment to the President's goals.

Our concern is narrow: the Oak Ridge and Paducah processes appear stalled without public updates or timelines, even as other priorities advance. We ask only that domestic deployment—not deprioritized amid broader efforts—receive due attention per the

May 2025 Executive Orders.

On federal land and resource allocation, we seek a clear path for developers who responded to open solicitations. Ownership structures and statutory issues, including FEOC considerations, are properly for Committee oversight. Our focus is forward: transparent, merit-based decisions giving American operators fair competition.

IV. THE OPPORTUNITY: NEAR-TERM NUCLEAR ON FEDERAL SITES

Paducah's Gaseous Diffusion Plant site stands out for near-term deployment: heavy industrial infrastructure, grid ties, skilled workforce, bipartisan support (Governor Beshear, Senators McConnell and Paul, Congressman Comer), and DOE operational capacity. Recent federal awards there, including for domestic HALEU enrichment, confirm its viability.

CoreHeld at Paducah is near-term, not aspirational—no new laws or frameworks needed. We ask DOE to evaluate responses and decide on merit.

Oak Ridge, hub of the nuclear renaissance (BWXT, Kairos, Oklo, others investing), would signal U.S. seriousness about dominance with an American-led naval deployment under existing authority.

CoreHeld is national in scope: modular, replicable across federal installations—military bases, national laboratories, DOE facilities in every region of the country. Alaska exemplifies this—chronic energy insecurity, vulnerable supply chains for major military installations, and among the highest electricity costs in the nation. Naval-derived systems could power installations and surrounding communities alike, delivering firm power where no grid alternative exists.

CoreHeld also complements existing energy infrastructure. As Senator Daines noted at this hearing with respect to Colstrip, Montana, additive near-term nuclear can revive aging industrial sites, preserve generational workforces, and stabilize local economies—using transmission infrastructure and workforce assets

already in place. The scalability of this model is not incidental; it is the mechanism by which the administration's 400-GW ambition becomes achievable. Proven, modular, American technology-replicated across dozens of federal sites—is how you quadruple capacity without starting from scratch.

V. THE BROADER NUCLEAR ECOSYSTEM: SMRs, MICROREACTORS, AND WHERE COREHELD FITS

HGP supports the full advanced nuclear spectrum—from plant restarts to small modular reactors and microreactors. The testimony of Dr. Laufer of Kairos Power and Dr. Wagner of Idaho National Laboratory rightly stressed the need for parallel pathways. The 400-GW target demands a portfolio, including near-term options while newer designs complete their authorization journeys.

HGP is a committed champion of the SMR and microreactor ecosystem: Kairos Power's Hermes demonstration at Oak Ridge, Oklo's Aurora powerhouse, Radiant's microreactor program, and the other participants in DOE's Reactor Pilot Program represent exactly the kind of American-led innovation this Committee should continue to champion. The milestone-based contracting model Dr. Laufer described—paying for results, not process—is a model worth extending across the industry.

Within that ecosystem, CoreHeld occupies a specific and advantageous position. The reactor architecture underlying CoreHeld has been operating continuously in the most demanding environments on earth for more than six decades—longer than any SMR or microreactor design currently under development. That operational heritage cannot be manufactured or accelerated. It already exists.

CoreHeld fits precisely in the segment where demand is most urgent and deployment timelines most constrained. Remote federal installations, forward operating bases, energy-insecure communities, and AI data centers all require reliable, compact, long-duration power at exactly the scale CoreHeld delivers. No other design at this scale can point to the same operational track record, and no other approach can be authorized and deployed on

federal land under existing DOE statutory authority with the same speed and certainty.

CoreHeld does not compete with the SMR and microreactor ecosystem—it bridges to it. By demonstrating proven near-term power on federal sites, CoreHeld builds the experienced workforce, supply-chain maturity, and grid-integration precedents that accelerate every SMR and microreactor deployment that follows. Success for CoreHeld is success for the entire American advanced nuclear industry.

VI. WHAT THIS COMMITTEE SHOULD DO

This Committee has the tools and standing to ensure that every element of the President's nuclear energy mandate—not just the headline programs—receives the sustained attention it deserves. We respectfully offer the following suggestions:

- Direct DOE to issue a public timeline for resuming and completing all paused federal nuclear site RFP and RFO processes, with written justification for any further delay.
- Encourage DOE to document, for the record, how its land transfers, grants, and awards align with the President's Executive Orders—including what consideration was given to domestic American developers in each relevant solicitation.
- Request DOE confirmation of full compliance with the Foreign Entity of Concern (FEOC) framework across all enrichment and site-related awards.
- Convene a dedicated hearing on the dual-use strategic value of deploying naval-derived reactor technology on federal lands, including implications for military readiness, grid resilience, and industrial base reconstitution.
- Champion federal-site nuclear as a centerpiece of the President's energy dominance legacy—led by American operators, American technology, and American workers.

VII. CONCLUSION

President Trump's Energy Dominance agenda serves national security, revitalizes communities like Paducah and Oak Ridge, and reclaims American leadership in the energy landscape of the 21st century. HGP Intelligent Energy seeks no subsidy or guarantee—only completion of DOE's initiated process, allowing American operators to compete on merit for American federal sites.

Any procedural gaps that have allowed the domestic federal site RFP process to go quiet while other priorities advanced represent a gap this Committee can close. Energy dominance is a mandate. HGP Intelligent Energy is committed to helping deliver it—on American soil, under American authority.

I thank the Committee for this opportunity and stand ready to provide any additional information or briefings the Committee may require.

Respectfully submitted,



Gregory A. Forero
Founder and Chief Executive Officer
HGP Intelligent Energy LLC
Dallas, Texas

Submitted for the Record
Senate Committee on Energy and Natural Resources
March 2026

Written Testimony from Standard Nuclear for the U.S. Senate Committee on
Energy and Natural Resources

Hearing to examine the Department of Energy's implementation of President Trump's May
2025 nuclear energy executive orders

Chairman Lee, Ranking Member Heinrich, and Members of the Committee:

Thank you for the opportunity to submit testimony on the implementation of President Trump's May 2025 executive orders and the progress being made to reestablish a robust American nuclear fuel cycle.

I write today from the perspective of a nuclear fuel company operating at the front lines of this effort. Over the last several years, a clear and urgent gap emerged. While there was a new generation of ambitious advanced reactor developers, the supply and production capacity for advanced fuel forms to power these reactors was absent in the United States. Most advanced reactors use TRISO fuel that is referred to as "the most robust nuclear fuel" by the US Department of Energy. Standard Nuclear was founded in late 2024 to bridge that critical gap and ensure advanced reactor deployments is not hindered by lack of TRISO fuel supply. We have built a flexible TRISO production line, already operating at industrial scale, and today we are manufacturing HALEU TRISO, serving multiple reactor developers, and we're growing quickly. Rather than being vertically tied to a single design, our approach is to supply TRISO fuel to whichever designs and companies that need it—enabling a broader ecosystem of innovation, eliminating choke points, and accelerating deployment timelines across the sector.

Before we got where we are, the bipartisan ADVANCE Act provided a clear and durable signal that the United States is committed to modernizing its nuclear regulatory framework to be more efficient, risk informed, and predictable. Coupled with the HALEU Availability Program, the President's Executive Orders directed the whole of government to make it all happen.

These actions generated the Advanced Reactor and Fuel Line Pilot Programs, Standard Nuclear was selected to become DOE's first Fuel Line Pilot Program awardee and were granted DOE Authorization to begin operations shortly thereafter. This means that rather than waiting years for a full commercial license, our staff are now busy at work, waking up every morning at 4:30 to make high quality, 19.75% enriched HALEU TRISO fuel at our flagship plant in Oak Ridge, Tennessee under rigorous DOE oversight. At the time of this

hearing we're making the fuel to power the new wave of microreactors that are on target to meet the President's goal of going critical by July 4th of this year. In doing so, we're also demonstrating the safety basis and process information for advanced fuel fabrication in a controlled and DOE regulated environment, generating the process, safety, and training data we'll need to transition to a commercial NRC license if we choose to do so.

Tying these federal actions together, Standard highly supportive of the announcement of DOE's Nuclear Lifecycle Innovation Campuses - a new effort to modernize the nation's full nuclear fuel cycle by integrating parts of the fuel cycle under with state-level leadership. State-level organizers understand the social and political temperature of their constituents on a very deep level. By incentivizing states to lead a coordinated effort to co-locate segments of the supply chain, we see the program as a force multiplier that will increase efficiency in building the nuclear supply chain while building trust with the public.

The deliberate and effective policy alignment across Congress and the executive branch have coalesced to create an enabling environment for nuclear unseen in a generation. So, our message is simple: keep going.

While the iron is hot, we would like to see the committee continue to oversee and encourage DOE cooperation with NRC and DOW on sharing expertise and aligning processes. There is a need for a clearly defined, expedited pathway for facilities that are transitioning from DOE authorization to NRC licensing. Many of the first-generation fuel cycle and reactor projects are operating in this hybrid space. Without a streamlined and predictable process, we risk slowing down projects that are close to commercial deployment. *A major risk that exists today is having to start from square one if one considers transitioning from DOE to NRC jurisdiction. If the federal agencies don't align on being able to leverage another's thoughtful licensing process, slowdown is guaranteed.* Now more than ever, it is important that the agencies involved receive the authorizations and appropriations needed to carry out their missions to restore American dominance in nuclear energy and further the energy security and national security of the United States.

Along those lines, Standard Nuclear is standing up two new facilities. One in Idaho, and a second Tennessee location with the intent of operating those, at least in the beginning under DOE authorization. Standard Nuclear, through its Joint Venture with Framatome, is also standing up a facility in the latter's existing NRC-licensed site in Richland, WA. With these facilities on track to come online within months, Standard will have more TRISO production capacity than anywhere else in the world (surpassing China). That is not just a company milestone—it is a strategic milestone for the United States. It represents the American dominance in a critical segment of the advanced nuclear chain.

Finally, Standard Nuclear is just one segment of the chain. We also must continue to invest in the full nuclear fuel cycle—conversion, enrichment, fuel fabrication, and transportation—ensuring that each segment develops in parallel rather than becoming a chokepoint for the others.

The progress we see today is real, and it is encouraging. Companies like Standard Nuclear are moving quickly to lock in our gains to rebuild critical capabilities in the U.S., but sustained success will require continued alignment between policy, regulation, and industry execution.

Thank you for your attention and for your leadership on these issues.

Respectfully submitted,
Kurt Terrani
CEO, Standard Nuclear
March 19, 2026

UNITED STATES NUCLEAR INDUSTRY COUNCIL

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March 19, 2026

Chairman Mike Lee
363 Russell Senate Office Building
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Ranking Member Martin Heinrich
709 Hart Senate Office Building
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Chairman Lee, Ranking Member Heinrich, and Members of the Committee on Energy and Natural Resources:

Thank you for your leadership in ensuring nuclear energy remains a top priority within the U.S. energy portfolio.

The United States Nuclear Industry Council (USNIC) represents over one hundred companies across the U.S. nuclear value chain, including utilities, reactor developers, fuel cycle companies, manufacturers, engineering firms, and service providers. Our members are actively engaged in sustaining the United States' existing nuclear fleet, deploying the next generation of advanced nuclear technologies, and strengthening the domestic industrial base that supports nuclear energy, national security, and U.S. global leadership.

The Committee's prioritization of implementation and oversight of President Trump's May 2025 Executive Orders is essential to accelerating the development, deployment, and global competitiveness of American nuclear energy.

These Executive Orders represent an important step toward strengthening U.S. leadership in nuclear energy at a time when global demand for reliable, carbon-free electricity is skyrocketing. As electricity demand grows—driven by advanced manufacturing, data infrastructure, and broader electrification—nuclear energy is uniquely positioned to provide firm, scalable power while supporting energy security and economic competitiveness.

We are encouraged by early implementation efforts from the Department of Energy (DOE), including the launch of pilot programs to support reactor construction and operation outside of the National Laboratories, which can help accelerate near-term deployment. DOE's work to support reactor testing and validation can help modernize Nuclear Regulatory Commission licensing by reducing duplicative processes and advancing a more risk-informed framework that preserves safety while improving efficiency and predictability.

Progress in strengthening the domestic fuel cycle is also critical. Efforts to support HALEU availability and mobilize fuel supply capabilities are foundational to advanced reactor deployment and long-term energy

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security. In parallel, DOE's continued use of financing tools and coordination with private sector partners will be essential to advancing projects from demonstration to commercial deployment.

As implementation moves forward, continued coordination between Congress and the Trump administration will be essential to ensure these directives translate into timely deployment and sustained private-sector investment. We encourage a continued focus on the following priorities:

- **Timely and predictable deployment:** Federal programs and funding mechanisms should be structured to support efficient project execution and reduce uncertainty for developers and investors.
- **Public-private partnership:** Close coordination with industry will be critical to ensure programs are aligned with real-world deployment needs and can be effectively utilized.
- **Fuel cycle readiness:** Strengthening domestic fuel supply capabilities, including HALEU availability, remains a foundational requirement for advanced reactor deployment.
- **Regulatory alignment:** DOE implementation efforts should remain closely coordinated with ongoing Nuclear Regulatory Commission reforms to ensure a cohesive and efficient pathway from demonstration to commercial deployment.

The success of these Executive Orders will ultimately be measured by tangible results: reactors under construction, strengthened domestic supply chains, and a policy and regulatory environment that supports repeatable, cost-effective deployment.

USNIC remains committed to working with the White House, the National Energy Dominance Council, the Department of Energy, the Nuclear Regulatory Commission, Congress, and other stakeholders to help ensure these efforts translate into meaningful progress for the U.S. advanced nuclear energy sector.

Respectfully submitted,

Todd J. Abrajano
President and CEO
United States Nuclear Industry Council