Southern Nuclear

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March 25, 2026

The Honorable Robert E. Latta, Chairman
Subcommittee on Energy
Committee on Energy & Commerce
U.S. House of Representatives
2125 Rayburn House Office
Washington, DC 20515-6115

Dear Mr. Latta,

Thank you for the opportunity to testify before the Subcommittee on Energy on Wednesday, January 7, 2026, and for allowing me to answer the questions for the record. Please find my responses attached for your review and consideration.

If you would like to discuss these or any other topics further, please let me know. Additionally, I would like to extend an invitation to you and your staff to visit and tour our Vogtle facility at your convenience in the future.

Best regards,

John B. Williams
Senior Vice President
Technical Services & External Affairs

JBW:kvj

Attachments

Additional Questions for the Record

<u>The Honorable Robert Latta (R-OH)</u>

1. **I have been interested in encouraging the development of reprocessing spent nuclear fuel.**

   My legislation with the gentleman from California's fiftieth district, the Nuclear REFUEL Act, seeks to streamline licensing requirements for nuclear fuel recycling facilities to enhance supply chain resilience and security of nuclear fuel for advanced nuclear power plants.

   a. **You have experience as a fuel buyer. What would be the considerations for the economics of reprocessed fuel?**

   At Southern Company we appreciate the support of the Nuclear REFUEL Act as well as the research and testing that is ongoing to make reprocessed fuel available and the correct economic choice for our customers.

   The principal economic consideration related to reprocessing of spent nuclear fuel is that the cost of recycled fuel is significantly greater than the cost of mining and processing new nuclear fuel. Under current market conditions, the use of reprocessed fuel would make electricity from nuclear power plants more expensive to produce, with a corresponding impact on electricity prices. The factors that make reprocessing spent nuclear more expensive than utilzing new fuel include:

      1. The significant capital cost of developing the recycling facilities;
      2. The cost of the complex chemical processes required to separate plutonium and other byproducts necessary to produce mixed oxide fuel and the cost of storage and disposal of those byproducts;
      3. The relatively stable and relatively lower cost of U3o8 and the conversion, enrichment and fabrication processes.
      4. The need to make physical modifications to the existing fleet of light water reactors to enable them to utilize Mixed Oxide Fuel, which is the most common and technically feasible form of reprocessed fuel.

   In addition, reprocessing of spent nuclear fuel does not eliminate the issues with the end of the fuel cycle. At best it postpones them in part. As stated above, reprocessing creates plutonium and other byproducts that must be stored or disposed of after reprocessing, and the Mixed Oxide fuel produced by reprocessing will eventually have to be disposed of, just as once through nuclear fuel does today.

In order for reprocessed fuel to become economically competitive and provide value for our customers, either the cost of reprocessed fuel would have to be materially reduced, or the cost of U3o8 and/or the other fuel cycle costs associated with new fuel would have to materially increase. Technological advances could achieve reductions in the cost of reprocessing. To date, those advancements have not resulted in lower costs.

2. **Our current operating fleet relies heavily on critical minerals such as Lithium 7. Li-7 is yet another critical mineral that China and Russia are large producers of. Given the Trump Administration's emphasis on the importance of critical minerals and the actions already taken by the administration to help revive conventional nuclear and bolster the emerging advanced nuclear industry, are there any supply chain concerns you have regarding Lithium 7 or other critical minerals?**

Yes. Lithium7 (Li7) is a critical material for the safe and reliable operation of pressurized water reactors, including units within Southern Company's operating fleet. While utilities have successfully managed supply through long-term contracts and inventory controls, Li7 remains a strategic supply chain risk due to its limited global production base and reliance on foreign sources.

In addition to geopolitical concentration, shelf-life variability between qualified vendors presents an operational consideration. Nuclear grade Li7 is subject to defined shelf-life limits, which affects inventory management, replacement timing, and long-term stocking strategies. These factors underscore the importance of coordinated procurement and pooled inventory approaches to mitigate supply risk.

a. **Where does the current operating fleet source Lithium 7?**

For Southern Company's operating units, including Farley and Vogtle, nuclear-grade Lithium-7 is currently procured from a German company, with China identified as the country of origin for the Li-7 material.

Across the broader operating fleet, Lithium-7 sourcing is similarly concentrated among a limited number of qualified international suppliers.

b. Do you have any recommendations on how to build out the domestic supply chain of Li-7?

Yes. From an operating fleet perspective, strategic stocking through Pooled Inventory Management (PIM) provides a near-term, risk mitigating approach while longer-term domestic production capabilities are developed.

Southern Nuclear is supporting the establishment of a PIM Equipment Committee (EC No. NE101LI7A002) to enable shared, strategic inventory of Lithium-7 across 12 participating nuclear utilities.

Under this approach:

- Lithium-7 would be strategically stocked at PIM and shared across participating utilities.
- The current PIM vendor is ISOFLEX, which provides a five-year shelf life, supporting improved inventory longevity compared to shorter shelf-life alternatives.
- Planned procurement includes 60 kilograms in 2026 and 60 kilograms in 2027, providing multi-year coverage for participating plants.

This pooled, multiutility model improves resilience, reduces individual utility exposure, and provides a practical bridge solution while broader domestic supply chain capabilities are evaluated.

3. As the United States looks to scale AP1000 and advanced nuclear deployment, where are the most significant remaining gaps in the domestic nuclear supply chain and fuel cycle, and how should federal policy prioritize addressing them?

During the years between 1980 and the early 2000s, the nuclear construction supply chain deteriorated because of the lack of new construction. The domestic nuclear supply chain was inadequate during the construction of Vogtle 3&4 and remains inadequate today in many respects. While the owners of Vogtle 3&4 were able to source some components and structures domestically, initial quality was not compliant with nuclear standards and rework was common, especially for large structural components such as structural modules and reactor coolant pumps. These issues resulted in delays and unanticipated costs in order to achieve the quality, safety and performance required of a nuclear power plant.

Moreover, there was no domestic source for almost all heavy forgings and large components. That situation has not materially improved. If a company were to build a new large light water reactor of any design today, most major components requiring large forgings would have to be imported from overseas. The wait times for those components would be substantial and require substantial deposits to secure a place in queue. Among the large structural members and components that had to be imported, primarily from Italy, Japan and South Korea, for Vogtle 3&4 were:

1. Pressurizers
2. Steam Generators
3. Reactor Vessels
4. Turbines

In addition, there is no domestic source for some highly specialized components critical to the AP1000, such as the explosive cartridges that operate squib valves essential to the AP1000's passive cooling system. The lack of a domestic source of production for the squib valve cartridges has very real operational consequences because the squib valves cannot be tested without spare cartridges because the cartridge can only be fired one time. Vogtle 3&4 has only recently acquired a sufficient supply of spare squib valve cartridges allowing us to conduct required testing, at a cost of millions of dollars.

The absence of a reliable domestic supply chain had very real negative consequences for Vogtle 3&4's cost and schedule, at a time when there were only four AP1000s under construction in the United States. Even if some domestic production capacity for these items is developed, which is unlikely without firm orders for new plants, construction at the scale being proposed would require many times that available internationally at the time that materials and components for the new units are sourced. Exacerbating this problem is that fossil plants, both gas and coal, will compete for some of the same production capacity, particularly for turbines, that new nuclear plants will need.

In contrast, the components for China's nuclear fleet were sourced almost exclusively from within China, with Chinese government support. In order to achieve an adequate level of domestic supply chain capacity in the United States, we believe that federal support to either the developer of new nuclear plants or the suppliers and vendors adding new manufacturing capacity will be required.

In order to provide an incentive to private industry to develop an adequate nuclear construction supply chain, a critical mass of new units will first have to be ordered to assure industry that it will have sufficient demand for its products to make the development of such capacity profitable. Government support that protects plant developers from the currently inadequate supply chain, and the adverse impact on construction costs and schedules will be essential to incentivizing potential plant developers to accept those risks. Tax incentives would mitigate excessive fabrication and construction costs, and tail risk protection would mitigate against unforeseeable risks such as supply chain delays and disruptions and rework that is necessary to ensure adequate quality. Without this kind of protection from the certainty of high construction costs and the risks of unanticipated costs, it will be difficult to achieve the administrations and the Congress' goals of 10 gigawatts of nuclear generation under construction by 2030 and the construction of the "nth" plant, after which such cost support should be unnecessary.

4. **I'd like elaboration on your testimony concerning Congressional support that could enable the development of more nuclear units:**

   a. **Specifically, you mention financial support to mitigate macroeconomic tail risk, what is that and why can't industry manage that risk?**

      Macroeconomic tail risk refers to the consequence to cost and schedule performance of a low probability, high impact event that's outside a company's control such that it disrupts licensing, financing, work force development or the supply chain for large capital projects. Nuclear projects are uniquely affected by macroeconomic tail risk due to their capital intensity and long duration.

      For example, a global pandemic, geopolitical shifts, inflation, labor disruptions, major weather events, etc., are all unforeseeable situations that, even with adequate planning and project preparation, can't be fully offset and can drastically impact the economics and schedule of a project if/when they occur.

      The nuclear industry has demonstrated that it can manage traditional risks, such as engineering and construction risk, along with regulatory and licensing risk. In fact, with the completion of Vogtle Units 3&4 engineering and licensing risks have been substantially eliminated for the AP1000. Still, companies must find a means to protect customers and shareholders from tail risk associated with unpredictable macroeconomic events, especially those impacting critical supply and workforce availability, where margins are already tight.

There are a variety of ways that the federal government can help mitigate the potential for macroeconomic tail risks to impact large infrastructure projects like large nuclear plants, including through durable policy and public-private partnership arrangements. We support any arrangement that helps expedite nuclear development while also protecting customers.

b. Can you explain why this type of support would not end up paying for mistakes that a company like Southern Company or any other company responsible for building a plant might make?

We are not asking Congress to pay for or cover mistakes by developers or utilities. We will always take full responsibility and accountability for ensuring these projects are done right, with safety and quality being our primary goal.

This type of support would ensure companies have what they need to execute large-scale infrastructure projects successfully despite circumstances that are outside of their control.

The Vogtle experience underscores the need for this type of support. During the construction of Units 3&4, Southern Company experienced three macroeconomic events outside of their control:

1. The tsunami disaster at Japan's Fukushima Daiichi nuclear plant in 2011, which raised alarms for nuclear power plants and projects around the world and caused the U.S. regulator to require design changes as a response.

2. The bankruptcy of the project's main contractor, Westinghouse, in 2017.

3. The global COVID-19 pandemic in 2020 that broadly impacted operations and industries, including the availability of a workforce.

This support provides a specific risk mitigation that gives certainty to utilities and utility regulators that customers will be protected from these macroeconomic events. Additionally, this supports the industry until such time as the nuclear construction infrastructure in the US is mature and can be more resilient in dealing with macroeconomic events and provide more certainty related to cost and schedule efforts.

c. **How long would Congress and the federal government need to financially support this industry? When do you think the "nth of a kind" is reached, and what does that mean for nuclear development going forward?**

The "design once, build many" model allows us to capitalize on learnings and keep the construction pipeline going resulting in scalable projects that can stand on their own merit without federal support.

A great example of this is the transition from Unit 3 to Unit 4. Southern Company built Unit 4 approximately 20% cheaper than Unit 3, and tested and commissioned Unit 4 in half the time of Unit 3. In the future, we should expect even more success and efficiency for nuclear development with cost and timing as long as we keep building and keep the workforce trained.

Importantly, to go from first-of-a-kind to nth-of-a-kind, it's going to be important to work from a complete design. Today, the AP1000 is that completed design. It's licensed, tested and operating, and the next developers of an AP1000 will get to work from that design bringing down the cost and the timing.
Further, there has to be enough industry momentum to build an order book such that both the nuclear supply chain and labor force are stood up in way to provide durable support for the long-term buildout. The number must be a sufficient signal to the market that companies are moving forward and that there will be nth-of-a-kind lessons learned that are shared from that fleet to the next units built. We believe it will take between 6 – 10 units to reach nth-of-a-kind for a given design.

Federal support is not intended to be permanent but to provide enough support to reinvigorate the nuclear construction pipeline.

5. **Regarding future deployment, how do existing nuclear sites reduce project risk, cost, and timelines compared to greenfield development, and how may federal policy better support redevelopment of these sites?**

The utilization of existing nuclear sites, as was the case with Vogtle 3&4, has great potential to leverage the site safety and environmental analyses that were used to license the site the first time, which reduce the cost and the time required for licensing such sites for additional units.

Initial licensing of sites of existing nuclear facilities required comprehensive safety reviews including the seismic characteristics of the site, flooding risk, the risk of extreme weather and any other site characteristic that could have an impact on safe operation of the nuclear plant. In addition, licensees are required to submit an exhaustive Environmental Report which guides the NRC Staff's discharge of its obligations under the National Environmental Policy Act ("NEPA") pursuant to which an Environmental Impact Statement was prepared for every existing nuclear plant site in the United States.

Additional nuclear units at an existing site should benefit from the work and analysis already performed on the site. As the ADVANCE ACT prescribes, NRC is now required by statute to "establish and carry out an expedited procedure for issuing a combined license pursuant to section 185 b. of the Atomic Energy Act of 1954 (42 USC 2235(b))" for any license applicant who proposes in its combined license application ("COLA") to construct a new reactor on a site "on which a licensed nuclear reactor operates or has operated" or "that is directly adjacent to a site on which a licensed nuclear reactor operates or has operated and has site characteristics that are substantially similar to that site." Implementation of this provision by NRC could substantially reduce both the costs associated with the preparation of redundant site safety analyses and Environmental Reports while conserving NRC resources by eliminating redundant licensing and environmental reviews. As the ADVANCE Act recognizes, these factors could combine to substantially reduce licensing schedules and add needed certainty to the licensing process.

In addition, the developers of new reactors on existing sites may benefit from existing infrastructure such as transmission facilities, water supply, emergency preparedness programs, facilities, and site security facilities. Finally, public acceptance of new nuclear units may be higher in communities that have received economic and employment benefits associated with existing nuclear power facilities.

While some greenfield sites could enjoy some advantages over existing sites (e.g., located physically closer to load or transmission resources, no necessity for demolition of existing structures, no overburdening of natural resources such as water supply, etc.), locating new facilities at existing sites could provide substantial benefits in the appropriate situation.

Federal policy can better support redevelopment of existing sites by requiring NRC to faithfully implement the requirements of the ADVANCE Act through Congressional oversight. Federal policy can also provide NRC and potential plant developers protection from NEPA challenges to NRC's improved processes under the ADVANCE Act by clarifying that NEPA does not require redundant environmental reviews of sites that have already been the subject of an Environmental Impact Statement or Environmental Assessment for a nuclear power plant.

6. Southern Company, TerraPower, and CORE POWER are involved in molten chloride fast reactor research with DOE's Idaho National Laboratory through the molten chloride reactor experiment. What this is really about is U.S. energy dominance leveraging innovative nuclear technology.

Unlike traditional reactors that use solid fuel rods and water as a coolant, molten salt reactors rely on liquid fuel—a mixture of salts containing fissile material. This design enables higher operating temperatures, improved fuel efficiency, and enhanced safety.

It also opens the door to new applications, including compact nuclear systems for ships and AI data centers. This technology is the catalyst for next-generation global nuclear leadership for the United States.

- **I understand the joint work at Idaho National Lab recently achieved a breakthrough in fuel synthesis, marking the first time in history that chloride-based molten-salt fuel has been produced for a fast reactor. What is the significance of that breakthrough?**

- **What may Congress do to support this research and ensure that MCFR technology is developed, de-risked, and commercialized for its full range of applications in a timely manner?**

<u>Significance of the Molten Chloride Fuel Synthesis Breakthrough</u>

This fuel synthesis breakthrough at Idaho National Laboratory (INL) is not incremental—it is an enabling milestone that moves an entirely new class of advanced nuclear technology from theory into operational reality – positioning the United States to lead in fast spectrum nuclear systems with strategic, economic, and security relevance.

With continued Congressional support, molten salt fast reactors can strengthen U.S. energy security, reinforce maritime and industrial leadership, and position American firms – not foreign competitors – to set global standards in next-generation nuclear technologies.

<u>Why this matters</u>

1. It unlocks an entirely new reactor class for the first time.

For decades, fast-spectrum molten-salt reactors existed only as designs and laboratory concepts. INL's successful production of enriched uranium chloride fuel at scale enables the Molten Chloride Reactor Experiment (MCRE) — the world's first operational test of a fast-spectrum, salt-fueled reactor system. This achievement marks the transition from laboratory research to hardware-based validation, a prerequisite for licensing and deployment.

2. It materially reduces commercialization risk.

Fuel synthesis, fuel handling, and salt chemistry uncertainty have long been among the risks for molten salt reactor (MSR) commercialization. This breakthrough demonstrates that fuel can be manufactured, handled, and prepared safely in the United States, using domestic facilities and expertise. That validation directly supports future licensing and de-risks private-sector investment in commercial MSR designs.

3. It enables strategic applications beyond the traditional grid.

Because molten chloride fast reactors operate at low pressure, use liquid fuel, and achieve high power density, they are well suited for strategic, non-traditional applications. The U.S. Department of Energy (DOE) and INL have explicitly noted relevance for maritime propulsion, remote installations, and other industrial uses - areas where U.S. leadership carries economic and national security importance and where clean, reliable power is increasingly critical.

4. It reestablishes U.S. leadership in fast-spectrum nuclear systems.

The scale of this fuel production effort is INL's largest since the Experimental Breeder Reactor-II era, marking a return of U.S. capability in fast reactors—a field where global competitors have continued to invest. This milestone demonstrates that the United States retains the technical depth, workforce, and institutional capability to lead in advanced nuclear innovation.

<u>How Congress Can Support and De-Risk MSR Technology</u>

Congress has a clear opportunity to ensure that this breakthrough translates into deployable U.S. energy infrastructure, domestic manufacturing capability, and long-term technology leadership. Fast spectrum molten salt reactors represent the last frontier in nuclear innovation that can set the United States apart from global competitors, including Russia and China, who have not ever built a machine like this.

1. Sustain support for integrated reactor experiments and demonstrations

DOE's Advanced Reactor Demonstration Program and Risk Reduction pathways were intentionally structured to drive commercially relevant reactor systems. The MCRE project reflects that intent: it was designed to generate the reactor physics, fuel handling, and operational data needed by regulators, utilities, and investors – not as a standalone research exercise, but as a bridge to deployment.

Congress can reinforce this approach by prioritizing integrated demonstrations that involve the full value chain, including vertically integrated utilities that are ultimately responsible for grid reliability, safety, and long-term operation.

2. Provide sustained funding for MCRE and follow-on demonstrations

Facilitate DOE's allocation of additional funding to existing projects as needed to complete the originally awarded scope of work and achieve research goals. MCRE is a short duration critical experiment designed to produce essential data for future licensing of molten salt fast reactors. Continued appropriations through DOE's Office of Nuclear Energy and the National Reactor Innovation Center (NRIC) are critical to ensure the experiment proceeds through operation, posttest analysis, and knowledge capture without interruption.

Historically, federal-private partnerships have been the successful path for first-of-a-kind nuclear deployment. Follow-on demonstrations, informed by MCRE results, will require similar collaboration to overcome early deployment and supply-chain challenges.

3. Maintain strong public private partnership models

MCRE is a collaboration among Southern Company, CORE POWER, DOE, EPRI, and INL – combining national laboratory expertise with private-sector execution and end-user perspective. Congress can reinforce this proven model by continuing to prioritize cost shared demonstrations that are directly supported by industry partners and aligned with real-world operating needs.

This approach ensures federal investment accelerates technologies that strengthen U.S. competitiveness, energy reliability, and emissions-free power, while building durable domestic capability rather than isolated research outcomes.

Additional Questions for the Record

The Honorable Troy Balderson (R-OH)

1. **We've seen several technology and data center companies make big bets on SMR technologies. These are companies with a history of investing in early-stage, innovative technologies that become commercialized and are widely used today. Why do you think these bets are being made on SMR technology today?**

    - **How important is it for us to accelerate both permitting and technology development of SMRs to win the AI race with China?**

    - **Would the growth of SMRs as the next wave of carbon-free power technologies be possible without data center growth in the United States?**

    Data center development in the US is the largest source of load growth and is the primary driver behind the consideration of additional nuclear generation deployment, including SMRs. While I cannot specifically speak to the motivations of technology and data center companies investing in SMR (“small modular reactor”) technologies, SMRs are marketed with the promise of factory construction, inherently safer designs, and a lower upfront capital requirement. The theory is that the modular sizing allows incremental investment and scaling that aligns with the load demand.

    While Southern Company is supportive of all nuclear technologies and believes that the efficient deployment of all nuclear technologies is essential to win the AI race with China, we believe it is important to acknowledge that there is only one reactor design in the US today that is fully designed, licensed and ready for construction – the AP1000. Additionally, due to economies of scale, the AP1000 delivers a lower per kilowatt installed cost than SMRs. Successful nuclear development programs worldwide have always utilized a design once, build many philosophy, and Southern Company believes that philosophy will allow for the most efficient deployment of nuclear technology in the US.

2. **How should the US Department of Energy best allocate loan credit authority through the Office of Energy Dominance Financing to accelerate small modular reactor development?**

   We believe that the EDF can efficiently fund these projects as well as new large-scale reactors through 1703, which was the same program utilized to fund Plant Vogtle Units 3&4. Also, considering the risks associated with first of a kind construction, we believe it would be incrementally helpful to have additional provisions in place that could address macro-economic uncertainty risk that is inherent in these types of long construction period projects.

3. **Accelerating capacity in the near term is critical. While constructing new nuclear facilities is imperative, more needs to be done to improve the output of existing nuclear facilities. How can the United States Department of Energy and the Office of Energy Dominance Financing encourage investments that improve efficiencies from existing nuclear facilities through uprates to support meeting demand in the near term?**

   Southern Company agrees that optimizing the existing fleet of nuclear units is critical to meet load growth. To support this effort, Southern Company requested and received loans from the DOE Energy Dominance Financing office to support the necessary capital upgrades to our existing nuclear fleet. These loans will allow Southern Company to make the necessary upgrades while delivering savings to customers.

   Additionally, the national labs are looking at opportunities to increase the output of the existing fleet beyond the levels currently being pursued. This work could provide insights on capabilities for future uprates.