Chairman Upton,

Thank you for your follow-up questions to my testimony of Feb. 6.

Question 1: There is a broad portfolio of activities that the Department of Energy can provide leadership to help develop advanced nuclear reactors. Some of those proposals include:

a. **A follow-on licensing project similar to "NP 2010" and the Small Modular Reactor Licensing Technical Support;**
b. **The development of a prototype reactor test bed infrastructure with extensive facility needs; and,**
c. **A multibillion dollar new fast neutron test reactor.**

All of these proposals would require sustained investment to successfully achieve the program goal. How would you recommend that DOE best prioritize and balance those types of proposed initiatives within realistic, historic budgets, while still providing the adequate level of funding to maintain INL's existing infrastructure and research programs than can have a more immediate and tangible impact on the existing nuclear fleet?

A follow-on licensing project similar to "NP 2010" and the Small Modular Reactor Licensing Technical Support, development of prototype reactor test bed infrastructure, and a new fast neutron test reactor, are important components of the United States regaining and sustaining its leadership in nuclear energy. While the government's (DOE's) efforts are essential, they need to be synchronized with the enabling of a vibrant nuclear energy industry, including a robust domestic supply chain.

Many of the program elements within DOE, including the initiatives you have listed, are aimed at supporting this goal. Predicting the future is not possible. We need a flexible portfolio where, in a funding-constrained environment, our priorities can be adjusted in terms of relative investments as the civil nuclear energy landscape evolves. Sustained funding at the appropriate levels (with adjustments as needed) for these initiatives would be in the nation's best short- and long-term interests.

Speaking more broadly, and in line with the Nuclear Energy Technology Roadmap developed by INL, Argonne and Oak Ridge national laboratories, Congress should support activities that have the greatest potential to foster breakthrough

technologies, particularly in regard to the cost of nuclear systems and U.S. technology deployment domestically and globally.

If we are to prioritize those initiatives based on today's understanding of the nuclear energy landscape, I would do so in this order:

1. SMR licensing technical support, leading to SMR deployment
2. A new fast neutron test reactor
3. Prototype reactors

Congress continues to support SMR development and deployment in the fiscal year 2018 budget. The 2019 Office of Nuclear Energy budget request specifies $54 million to support SMR technology. Continued technology support is important to ensure the future of nuclear energy, and by extension, the nation's economy, environment, and national security.

Considerable private and public investment has been made in light-water-based SMR technologies. Therefore, crossing the finish line through a full-scale, first-of-a-kind demonstration with this technology is in our best interest and would be a short-term win for U.S. leadership.

If this goal is not achieved, thinking about longer-term leadership in other advanced reactors would be difficult for the U.S. It is also important to note that achieving this first-priority goal is not based solely on investments in technical support (which is relatively small given the maturity of this technology), but requires policy-related support as discussed below in the answer to your second question.

In sustaining U.S. leadership in nuclear energy technologies, a new fast neutron test reactor should be the second-highest priority because it will enable multiple advanced reactor technologies of the future without DOE deciding what the best technology should be.

A fast test reactor will allow industry to increase the maturity and improve the economics of various advanced reactors they are working on, and the best competitive technologies will emerge naturally through market decisions.

The fast test reactor will fill a major void in our R&D infrastructure, and strengthen our global R&D leadership which has been brought to world-leading standards in the last two decades in many areas except in enabling the

commercialization of fast-spectrum small or large reactors. Currently, the U.S. industry developing these technologies relies on access to reactors in Russia, a competitor to the U.S companies for leadership of this technology.

Finally, it is important for the U.S government to support first-of-a-kind technology demonstrations. However, the decision on what technologies need to be demonstrated must be based on:

- industry interests;
- solid business plans that lead to subsequent large-scale commercialization following the demonstration;
- private-sector interest in cost-sharing such demonstrations. As private-sector interest in such demonstrations grows financially and technically, priorities in the public funding at appropriate levels to support these interests should be adjusted.

Question 2: INL has worked with NuScale since the outset of their efforts to develop this new design. What other policies should be considered to help the deployment of SMRs?

Private-public partnerships are absolutely necessary to getting first-of-its-kind technologies into the marketplace.

As INL has worked with NuScale, other companies interested in developing and deploying SMRs, vendors and government officials, consensus opinion is that the following federal policies would facilitate the private-public partnerships needed to design, demonstrate and deploy SMRs:

1. Expansion of the SMR Licensing Technical Support (LTS) program to include the design and engineering, regulatory review, and approval of SMR technologies and facilities.
2. An SMR commercial deployment program to stimulate new SMR generation sufficient for self-sustaining deployment, made available through a combination of the following investment mechanisms:
    - Production tax credits (PTC) that stimulate SMR deployment as already enacted by Congress in EPACT (2005) and modified and extended earlier this year as part of the Bipartisan Budget Act of 2018.

- Allowing the Department of Energy and Department of Defense to enter into long-term power purchase agreements (PPA) and compensate SMR projects that supply carbon-free and highly resilient and reliable electricity to facilities supporting critical national security missions or other federal goals and priorities.
- Loan guarantees that support financing, through continuation of the existing loan guarantee program and authority, for design and construction of SMR facilities and SMR component manufacturing facilities.

3. An SMR investment tax credit (ITC) for manufacturing capabilities that form a robust U.S. supply chain for domestic SMR facilities and export of U.S. SMR components, equipment, and reactor technologies.
4. DOE research, development and demonstration of innovative SMR capabilities.
5. DOE and DOD programs to develop the requirements and specifications for SMR-powered (and very small SMR) secure and reliable microgrids, capable of operating independent of the main electrical grid, to improve reliability and resiliency for selected federal facilities to make them less vulnerable to man-made and natural threats.

I want to commend the Idaho State Legislature, which recently enacted statute changes that will assist NuScale Power and a partner utility in its effort to deploy a first-of-its-kind SMR on the INL Site, and allow the Laboratory to utilize up two of the 50-megawatt modules for vital research and development.

Programs such as The Joint Use Modular Plant (JUMP) initiative would allow INL to use one or two of the modules to examine how we can use energy differently in the future, create more integrated systems, and demonstrate safe, secure and resilient microgrid systems.

I would also commend the federal government for its efforts to develop and deploy SMRs. The Department of Energy has supported the design and licensing of the NuScale SMR with a $217 million grant of matching funds.

Mark Peters,

Director, Idaho National Laboratory