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## Background

The President's FY2018 budget request was released in May 2017. The Department of Energy's (DOE's) Office of Nuclear Energy request includes \$20 million for research and development (R&D) to explore different SMR designs. The DOE request did not include support for the SMR Licensing Technical Support (LTS) program. SMR Start has informed DOE and Congress of the need for \$100 million in FY2018 to support SMR licensing, engineering and advanced manufacturing development.

Actual funding for SMRs in FY2018 will be determined by Congress and may differ from the President's request. There has also been discussion of the possibility of a partial or full-year continuing resolution that may impact programmatic direction. Recognizing the uncertainty of the actual funding for FY2018, SMR Start is providing the following recommendations to the Department of Energy on how they could utilize funds for SMRs to most effectively accelerate development.

## Recommendations

The primary mission for DOE support for SMRs should be to accelerate the development of technology so that U.S. designs can be deployed by the mid-2020s and are competitive with international designs. In order to achieve this mission, DOE will need to focus on the development and engineering of technology necessary to design, manufacture and construct SMRs. Also inherent in this mission is the need to reduce the cost and time to market of U.S. SMR designs. DOE should include the following in the scope of SMR funding:

*Engineering and licensing:* Advance the engineering, certification, licensing, and siting of U.S. SMR designs, and reduce economic, technical, and regulatory barriers to their deployment. Examples include:

- Preparation and regulatory review of design and site licensing applications.
- Furtherance of first-of-a-kind engineering, and preparation of manufacturing, procurement and construction documents.
- Development of innovative design features and components that improve safety and performance (e.g., components, such as control rod drive mechanisms and penetrations, in high pressure/high temperature environments, auxiliary and support systems).
- Modeling and simulation of the plant and components to optimize safety, performance and life cycle cost.

*Manufacturing, Fabrication and Construction Techniques:* Develop and demonstrate advanced manufacturing methods for nuclear parts, components, and full-scale plants, and integrated efforts that could positively impact the domestic nuclear manufacturing enterprise to achieve cost reductions and to inform detailed design of SMR components, systems and structures. Examples:

- Advanced manufacturing of scale and full size reactor pressure vessel and/or other key reactor components (e.g., additive manufacturing, hot isostatic pressing, electron beam welding).

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- Establish a manufacturing research center of excellence with a network of facilities to improve the performance and reduce the cost of manufacturing.
- Inspection and testing capabilities and process controls that improve the quality, and reduce the cost and time of manufacturing and construction.
- Code committee and regulatory acceptance of advanced manufacturing, fabrication and construction techniques.

*Component, Systems and Operational Support Development:* Develop and demonstrate enhanced component and system performance to reduce technical and operational performance risks, increase safety and lower costs. Examples:

- Establish a facility to demonstrate novel operating and maintenance processes, such as refueling operations.
- Procedures, processes, and methodologies that can impact operational efficiencies.
- Operational real-time inspection and monitoring capabilities.
- Sensors, instrumentation and control systems and other technology to automate and improve operation and maintenance of the plant.
- Integration of nuclear energy into non-electric and hybrid applications.
- Demonstration of the capability to power micro-grids and provide highly reliable (e.g., 99.999%) power to national security and mission critical activities.