Phase 1 NuScale SMR FOAK Nuclear Demonstration Readiness Projec

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Program: First of a Kind Nuclear Demonstration Readiness Projects

ABSTRACT:

Project Objectives: The overarching objective of the Phase 1 NuScale SMR FOAK Nuclear Demonstration Readiness Project is to enhance innovation and competitiveness of the U.S. nuclear industry by enabling timely deployment of the NuScale Small Modular Reactor (SMR). The proposed activities are required to ensure both design completion and supply chain readiness to meet a commercial operation date (COD) of 2026 for the first-of-a-kind (FOAK) NuScale plant. Specific objectives of the proposed Phase 1 Project are:

- To fully support Nuclear Regulatory Commission (NRC) review of the NuScale design certification application (DCA) to ensure approval of a final safety evaluation report (FSER) by the end of 2020
- To improve deployment schedule confidence by consolidating manufacturer, and engineering, procurement and construction (EPC), work scopes into an integrated plan that can achieve COD in 2026
- To accelerate design maturity, technology development, and industry readiness to support an initial 2019 customer commitment for plant deployment

Our Phase 1 Project objectives will provide direct benefits to NuScale, domestic manufacturers and service providers in the NuScale supply chain, utility customers, and the overall U.S. economy.

Project Description: The NuScale SMR is an elegantly simple advancement of pressurized, light-water-cooled reactor technology that reduces complexity, improves safety and resilience, enhances operability, and reduces costs. Our proactive engagement with NRC, as well as design engagement of suppliers and potential customers, has led to an evolutionary design process that anticipates and solves design, licensing, and modularization issues in advance. The design is backed by extensive testing and simulation to support the design basis. The NuScale design incorporates design innovations that make our SMR safer than currently certified designs, including our “triple crown of safety” - a failsafe emergency core cooling system that requires no operator intervention, no AC or DC power, and no additional water for an indefinite cooling period.

To date, work has progressed through submission of a Design Certification Application, docketing by the NRC, and nearly one year of NRC review. The Phase 1 Project scope represents the next phase of the U.S. product realization effort required to bring the NuScale design to market. This project includes advancing the NRC DCA review to achieve major licensing milestones; completing the operator training required for integrated systems validation; performing selected I&C and system integration efforts; further developing the design to ensure manufacturability, constructability, and operability; facilitating supply chain readiness; and supporting customer project development. These efforts improve cost and schedule certainty, support an initial customer commitment for deployment, and are fundamental building blocks necessary to meet the 2026 COD deployment milestone.

Major Deliverables: The Phase 1 Project will be completed in December 2018 and will result in several key accomplishments that include the following key milestones:

- Selection of manufacturer of NuScale Power Modules™
- Completion of master deployment plan integrating NuScale, module manufacturer, and EPC
- Completion of Integrated Systems Validation training and testing
- Completion of control rod assembly drop alignment testing

In addition, the project will continue to progress the review of the design certification application and will advance the design development and demonstration of FOAK systems and the development of the NuScale supply chain.

Potential Impact of the Project: Successful licensing, commercialization, and deployment of NuScale SMRs provide direct and lasting benefit to the U.S. The project utilizes a U.S.-based supply chain, thus creating jobs and economic benefits throughout the nation. Currently, 92% of supplier contracts are with U.S.-based companies. It maximizes the probability of successful and timely certification of the design through a proactive NRC interaction and matures the module and plant design, to reduce customer risk and increase deployment schedule certainty. The project creates a viable SMR technology for domestic and export market deployment, which in turn helps to reestablish a global U.S. pre-eminence in advanced nuclear technology. NuScale is well-positioned to meet potential global demand for SMRs while facilitating future innovations and economic competitiveness within the U.S. nuclear industry.

Major Participants: NuScale offers its response to this FOA as a single entity, NuScale Power, LLC.