

April 8, 2016

Docket: PROJ0769

U.S. Nuclear Regulatory Commission  
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**SUBJECT:** NuScale Power, LLC Submittal of Response to NRC's letter, "NuScale Control Room Configuration and Staffing Levels," January 14, 2016

**REFERENCE:** Letter, U.S. Nuclear Regulatory Commission to NuScale Power, LLC, "NuScale Control Room Configuration and Staffing Levels," January 14, 2016 (ML15302A516)

In the referenced letter to NuScale Power, LLC (NuScale) dated January 14, 2016, the U.S. Nuclear Regulatory Commission (NRC) outlined two options that NuScale may consider for addressing the regulatory requirements of 10 CFR 50.54(m) in its design certification application (DCA). The letter also addressed the minimum requirements for staffing of licensed operators, and the scope of the human factors engineering (HFE) information expected to be included in the DCA.

The NRC Staff conducted an onsite audit of NuScale's HFE program from March 29, 2016 through March 31, 2016. NuScale appreciates the opportunity to discuss its HFE program in detail with the NRC Staff, and appreciates the Staff's time, thoroughness, openness, and feedback during the audit.

The purpose of this letter is to respond to NRC's January 14, 2016 letter. The attachment to this letter describes the option that NuScale plans to pursue for addressing the 10 CFR 50.54(m) requirements and the planned scope of HFE information in the DCA, and reflects the NRC Staff's feedback on the expected content of the DCA during the Staff's HFE audit.

As discussed in the attachment, NuScale will provide the technical basis for rulemaking language that addresses control room staffing in conjunction with control room configuration as part of the design certification. NuScale requests that a public meeting be held by the end of June 2016 to discuss the regulatory process for implementing this approach in the NuScale design certification rulemaking.

This correspondence includes preliminary and conceptual information which reflects the current stage of the NuScale design and may be subject to change.

Please feel free to contact Steven Mirsky at 301-770-0472 or at [smirsky@nuscalepower.com](mailto:smirsky@nuscalepower.com) if you have any questions.

Sincerely,



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Attachment: "NuScale Response to NRC Letter dated January 14, 2016"

**Attachment: NuScale Response to NRC Letter Dated January 14, 2016****NuScale approach to address 10 CFR 50.54(m) requirements**

In the referenced letter dated January 14, 2016, the NRC described two options that NuScale may consider for addressing the regulatory requirements of 10 CFR 50.54(m) in the design certification application (DCA) in order to provide greatest degree of issue finality and regulatory certainty on the issue of control room staffing. NuScale plans to pursue the first option, whereby NuScale would propose for certification as part of the design certification (DC) rulemaking an alternative approach to control room staffing to be used in lieu of 10 CFR 50.54(m). Under this approach, NuScale would provide the technical basis for rulemaking language that addresses control room staffing in conjunction with control room configuration as part of the design certification. A future combined license (COL) applicant that incorporates the NuScale design certification by reference would follow the certified NuScale approach. Such a COL applicant would not need an exemption from 10 CFR 50.54(m) because the applicability of this regulation would be addressed in the DC rule.

The NuScale plant is designed to operate up to twelve modules from a single main control room (MCR), which is a configuration not specifically addressed in 10 CFR 50.54(m). Due to NuScale's passive safety systems, simplicity of operation, automation, reduced licensed operator workload, limited important human actions, and ample time to complete operator actions, the NuScale plant has been designed on the basis of different licensed operator staffing levels than 10 CFR 50.54(m) anticipated.

SECY-11-0098, Operator Staffing for Small or Multi-Module Nuclear Power Plant Facilities, recommends "a two-step approach to address operator staffing requirements for SMRs. In the near-term, applicants can request exemptions to the current operator staffing requirements in 10 CFR 50.54(m) and the staff will review the request using existing or modified guidance. Once experience is gained, the staff would initiate the long-term solution, which is to revise the regulations to provide specific control room staffing requirements for SMRs." As the first small modular reactor (SMR) vendor to develop a design based on a different licensed operator staffing requirement and control room configuration than that required by 10 CFR 50.54(m), NuScale is in the unique position of working with the NRC in exercising the existing guidance.

To provide the technical justification for an alternate staffing solution, NuScale plans to use the existing guidance in NUREG-0800, NUREG-0711, and NUREG-1791, consistent with SECY-11-0098, and NUREG/CR-6838, Technical Basis for Regulatory Guidance for Assessing Exemption from the Nuclear power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m). NuScale proposes to incorporate the guidance in NUREG-1791, specifically Section 10, Review the Staffing Plan Validation, into the Staffing and Qualification (S&Q) results summary report (RSR). NuScale thereby intends that NRC review and approval of the S&Q RSR would constitute the technical justification for the alternate staffing regulation included in the DC rule.

**NuScale's proposed scope of information in the DCA and during the DCA review****Implementation Plans**

NuScale has submitted implementation plans (IPs) in accordance with the guidance of NUREG-0711 for the following HFE elements:

- Program Management Plan
- Operating Experience Review
- Functional Requirements Analysis and Function Allocation
- Task Analysis
- Staffing and Qualifications

- Treatment of Important Human Actions
- Human-System Interface Design
- Human Factors Verification and Validation
- Design Implementation

NuScale will submit revised IPs for the following elements as part of the DCA:

- Program Management Plan
- Human Factors Verification and Validation
- Design Implementation

Implementation plans for the procedure development and training program development elements are not required in FSAR Chapter 18 because the subjects are addressed in FSAR Chapter 13.

In accordance with NUREG-0711, Section 13, an IP for monitoring human performance needs to be provided after the plant becomes operational. Therefore the human performance monitoring IP is considered a COL item.

### **Results Summary Reports submitted as part of the DCA**

NuScale will submit the following RSRs as part of the DCA:

- Operating Experience Review
- Functional Requirements Analysis and Function Allocation
- Task Analysis
- Staffing and Qualifications
- Treatment of Important Human Actions
- Human-System Interface Design
- Human Factors Verification and Validation

Unless otherwise noted, the contents of the RSRs will be in accordance with the applicable guidance of NUREG-0711.

Each of these RSRs will contain an updated version of the methodology described in the previously submitted implementation plans. These RSRs will therefore supersede the previously submitted IPs for the respective HFE elements.

The RSRs will only cover activities performed by licensed control room operators including the shift supervisor and shift technical advisor. The activities of non-licensed operators, maintenance or refueling activities, activities associated with the technical support center (TSC), emergency operations facility (EOF), operational support center (OSC), or any other emergency response facilities will only be considered if they are determined to impact licensed operator workload. If licensed operator workload is impacted then the area of concern will be analyzed to a degree sufficient to quantify the impact to licensed operator workload and develop any human-system interface (HSI) required to address the specific task.

The S&Q element will provide the staffing plan validation by evaluating control room staff workload during challenging operating conditions that represent at least three of the highest workload scenarios for a NuScale power plant control room crew.

### **Human-System Interface Design Results Summary Report**

NUREG-0711, Section 8.3 states that, at a minimum, the HSI RSR should include, "the detailed HSI description of the main control room, technical support center, emergency operations facility, remote

shutdown facility, and local control stations, covering their form, function, and performance characteristics.” NUREG-0711 Sections 8.4.4.3 and 8.4.4.4 provide detailed requirements for the TSC and EOF HSI that will be completed after developing an emergency plan, and therefore will be a COL item associated with FSAR Section 13.3, Emergency Planning. The HSI used in the TSC, EOF, remote shutdown station (RSS), and local control stations (LCS) will be derived from the main control room HSI. When developed, the specific HSI screens for these facilities will conform to the HSI style guide and the TSC and EOF HSI will also comply with guidance in NUREG-0696, “Functional Criteria for Emergency Response Facilities.”

**Results Summary Report submitted prior to Phase 4 of the DCA review**

Consistent with the table entitled “HFE Documents to Submit after Docketing and Prior to Phase 4” that the NRC presented at a public meeting on February 8, 2016, NuScale will submit the Human Factors Verification and Validation RSR prior to Phase 4 of the NRC’s review of the NuScale DCA.