January 14, 2016

Mr. Thomas Bergman
Vice President, Regulatory Affairs
NuScale Power, LLC
1100 NE Circle Boulevard, Suite 200
Corvallis, OR 97330

SUBJECT: NUSCALE CONTROL ROOM CONFIGURATION AND STAFFING LEVELS

Dear Mr. Bergman:

The purpose of this letter is to respond to the June 30, 2015, letter to the U.S. Nuclear Regulatory Commission (NRC) from Mr. Steven Mirsky, Licensing Manager, titled, "NuScale Power, LLC Submittal of Proposed Scope of Human Factors Engineering Information in Design Certification Application (NRC Project No. 0769)," (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15181A475), and the July 22, 2015, letter to the NRC from Mr. Steven Mirsky, Licensing Manager, titled, "NuScale Power, LLC Key Issue Resolution Prior to Design Certification Application (NRC Project No. 0769)," (ADAMS Accession No. ML15203B306). In his July 22, 2015 letter, Mr. Mirsky states that NuScale prefers including a request for an exemption from Title 10 of the *Code of Federal Regulations* (10 CFR) 50.54(m), which discusses minimum requirements for the staffing of licensed operators at nuclear power plants, in its design certification (DC) application, because it would provide regulatory certainty to future license applicants that reference the NuScale design. This letter provides clarification of the process NuScale can use to achieve the greatest degree of issue finality and regulatory certainty for control room configuration and staffing levels for the NuScale design.

Minimum Requirements for Staffing of Licensed Operators

The DC application requirements as set forth in 10 CFR 52.47(a)(8) incorporate the technically relevant requirements of 10 CFR 50.34(f). Regulations in 10 CFR 50.34(f)(2)(iii) direct an applicant to "provide, for Commission review, a control room design that reflects state-of-the-art human factor principles prior to committing to fabrication or revision of fabricated control room panels and layouts." The NRC staff uses the guidance in NUREG-0711, "Human Factors Engineering Program Review Model," to verify that an applicant's human factors engineering (HFE) program and its products reflect state-of-the-art human factors principles. The HFE program review model consists of 12 elements that should be described and demonstrated in an application. One of these elements is staffing and qualifications. If the control room staffing does not meet the requirements in 10 CFR 50.54(m), then NUREG-0711, Section 6.4, "Review Criteria," Criterion 2, instructs the staff to use the guidance in NUREG-1791, "Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m)," to determine whether the staffing proposal provides adequate assurance that public health and safety will be maintained at a level that is comparable to compliance with 10 CFR 50.54(m).

As stated in the September 15, 2015, letter to the NRC from Mr. Steven Mirsky, Licensing Manager, titled, "NuScale Power, LLC Submittal of NuScale Preliminary Concept of Operations Summary and Response to NRC Questions on Control Room Activities (NRC Project No. 0769)," (ADAMS Accession No. ML15258A846) NuScale proposes that for its current design, six licensed operators will operate up to 12 reactor modules from a single control room. This staffing proposal does not meet the requirements set forth in 10 CFR 50.54(m), and, without more information beyond that currently available to the NRC staff, would not support the NRC staff's review of the control room design. NuScale must, therefore, submit an adequate technical basis for its proposed control room staffing as part of the DC application. The NRC staff will use the guidance in NUREG-0711 and NUREG-1791 to complete its review, including a review of NuScale's staffing plan validation.

The DC application must address the full range of reactor module combinations from one to multiple modules as it affects control room configuration and staffing levels, including a designation between dedicated - as opposed to non-dedicated - operators. Additionally, NuScale must select scenarios that are complete and representative of the highest workload conditions for the staffing plan validation. For example, scenarios should account for the fact that operators may need to implement the emergency plan or the fire response plan during some plant events. The scenarios should account for such tasks. Draft Revision 3 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Chapter 18, "Human Factors Engineering," Attachment B, "Methodology to Assess the Workload of Challenging Operational Conditions In Support of Minimum Staffing Level Reviews," provides guidance that NuScale can use to select scenarios for the staffing plan validation.

Use of or Need for Exemptions from 10 CFR 50.54(m)

One option NuScale may consider for addressing the regulatory requirements of 10 CFR 50.54(m) in its design certification application, in order to provide issue finality and regulatory certainty on the issue for future combined license (COL) applicants, is as follows. NuScale could propose an alternative approach to control room staffing in Tier 1 of the DC application to be used in lieu of 10 CFR 50.54(m). Under this approach, NuScale would provide the technical basis for the Tier 1 language that addresses control room staffing in conjunction with control room configuration as part of the design certification. If the DC is approved, a COL applicant that incorporates the NuScale design certification by reference would follow the NuScale approach certified in Tier 1. 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. This option could provide the greatest degree of issue finality and regulatory certainty on the issue of control room staffing.

A second option could be for NuScale to provide the technical basis for a future exemption from 10 CFR 50.54(m) in Tier 2 of the design certification application. Under this approach, NuScale would not request an exemption from 10 CFR 50.54(m) in its DC application but would include in Tier 2 of the DC application the technical basis a future COL applicant referencing the NuScale design certification would need to request an exemption from 10 CFR 50.54(m). A COL applicant would use the technical basis documented in the DC in connection with the control room design as the justification for not meeting the requirements of 10 CFR 50.54(m). This option does not provide the same degree of issue finality and provides less regulatory certainty than the option outlined above on the issue of control room staffing.

NuScale's Proposed Scope of Human Factor Engineering Information in Design Certification Application

NuScale stated in its June 30, 2015, letter that it plans to submit an implementation plan in its DC application instead of a results summary report for the verification and validation element. If NuScale provides the detailed information listed below for the verification and validation element, the NRC staff would be able to accept the DC application with regard to this element for review and docketing; however, the NRC staff cannot complete its review and its final safety evaluation with regard to this element for the DC until the review of the results summary report for the verification and validation element is completed. Such an approach would place the NuScale DC review schedule at substantial risk of not being completed in the 40 month time frame NuScale requested in the April 21, 2015 meeting with the NRC staff (meeting summary at ADAMS Accession No. ML15119A452).

The NRC staff would also like to reiterate its expectation that NuScale will submit a results summary report for the human-system interface (HSI) design element with its DC application. The NRC staff previously communicated this position to NuScale in a May 2015 meeting. NuScale stated in its June 30, 2015, letter that it does not intend to submit a results summary report for the HSI design element with the DC application, and an implementation plan will be submitted instead. The letter also states, "As acknowledged by the NRC, the HSI design is not expected to be complete at the time of the DC application…." However, the NRC's May 13, 2015, "Summary of the March 2, 2015, Closed Meeting with NuScale Power, LLC to Discuss Topics Related to Human Factors Engineering and Control Room Staffing (TAC No. RN6110)," (ADAMS Accession No. ML 15072A347), documents the NRC staff's position that the staff expects NuScale to submit a results summary report for the HSI design element in its DC application. If the design is successfully validated, then the HFE design is complete and can be approved. If the validation is unsuccessful, then the HFE design will need to be amended to reflect the corrective actions identified by the integrated system validation. In the latter case, the NRC staff's safety evaluation report (SER) would be on hold until the corrective actions are addressed.

In summary, for the staff to docket and review a NuScale DC application incorporating one of the above approaches to control room staffing on a schedule that NuScale would hope to achieve, the staff will need to see the following information in Chapter 18:

- Results summary reports for the operating experience review, functional requirements analysis and function allocation, task analysis, staffing and qualifications, treatment of important human actions, and HSI design elements as described in NUREG-0711.
- The results of the staffing plan validation should be submitted as part of the staffing and qualification results summary report. Guidance for conducting the staffing plan validation is contained in NUREG-1791 and in NUREG/CR-6838, "Technical Basis for Regulatory Guidance for Assessing Exemption Requests from the Nuclear Power Plant Licensed Operator Staffing Requirements Specified in 10 CFR 50.54(m)."
- Implementation plans for the HFE program management and design implementation elements as described in NUREG-0711.
- An implementation plan for the verification and validation element as described in NUREG-0711. This may be submitted for review before the DC application is submitted.

- An implementation plan may be submitted for the human performance monitoring element, or in lieu of an implementation plan, this element may be a combined license applicant information item.

As a clarification, implementation plans for the procedure development and training program development elements are not required in Chapter 18 because the subjects are addressed in Chapter 13 of the DC application. However, the verification and validation results summary report is needed to support the completion of the staff's final SER and review of the DC.

NuScale should engage the NRC staff in a public meeting to discuss the method for conducting the staffing plan validation and to determine when the results summary report for the verification and validation element will be submitted. In addition, NuScale should provide to the NRC staff their approach towards addressing the requirements of 10 CFR 50.54(m) before the end of the first calendar quarter of 2016.

Should you have any questions, please contact Mr. Greg Cranston, Senior Project Manager for the NuScale design certification at (301) 415-0546 or via email at gregory.cranston@nrc.gov.

Sincerely,
/RA/

Frank Akstulewicz, Director
Division of New Reactor Licensing
Office of New Reactors

Project No.: PROJ0769

cc: NuScale Power LLC Listserv

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Should you have any questions, please contact Mr. Greg Cranston, Senior Project Manager for the NuScale design certification at (301) 415-0546 or via email at gregory.cranston@nrc.gov.

Sincerely,
/RA/

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Project No.: PROJ0769

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