



April 11, 2018

Docket No. 52-048

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Response to NRC Request for Additional Information No. 390 (eRAI No. 9371) on the NuScale Design Certification Application

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 390 (eRAI No. 9371)," dated March 19, 2018

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's response to the following RAI Question from NRC eRAI No. 9371:

- 18-24

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Steven Mirsky at 240-833-3001 or at smirsky@nuscalepower.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad".

Zackary W. Rad
Director, Regulatory Affairs
NuScale Power, LLC

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Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9371



Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 9371

Response to Request for Additional Information Docket No. 52-048

eRAI No.: 9371

Date of RAI Issue: 03/19/2018

NRC Question No.: 18-24

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide a final safety analysis report (FSAR) that must include the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v). Section 10 CFR 50.34(f)(2)(iii) requires 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." Chapter 18, "Human Factors Engineering," of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," and NUREG-0711, "Human Factors Engineering Program Review Model," identify criteria the staff uses to evaluate whether an applicant meets the regulation. The applicant stated in the FSAR, Tier 2, Section 18.0, "Human Factors Engineering - Overview," that its human factors engineering (HFE) program incorporates accepted HFE standards and guidelines including the applicable guidance provided in NUREG-0711, Revision 3.

Criterion 11.4.3.4 (1) states, "Participants in the applicant's validation tests should be representative of plant personnel who will interact with the HSI (e.g., licensed operators, rather than training personnel or engineers)." In addition 11.4.3.4 (4) states, "The applicant should prevent bias in the sample of participants by avoiding the use of participants who:

- are members of the design organization
- participated in prior evaluations
- were selected for some specific characteristic, such as crews identified as good performers or more experienced

The Human Factors Verification and Validation Implementation Plan, Section 4.4, "Individual operating crews participating in the ISV may be previously licensed commercial reactor or senior reactor operators, operators with Navy nuclear experience, or design engineering staff members familiar with the NuScale Power plant design."

As members of the design engineering staff are cited as potential ISV participants, please clarify how they are representative of the anticipated plant personnel who will interact with the HSI and explain how bias is prevented. Also, please clarify whether ISV participants have participated in



prior evaluations (e.g. staffing plan validation, etc).

NuScale Response:

Twenty two individuals have been selected to perform as plant personnel in the Integrated System Validation (ISV) testing. The selected individuals are categorized into three groups based on their previous experience.

- Previously licensed commercial nuclear power plant operators (either SRO or RO) (nine individuals)
- Previously non-licensed commercial nuclear power plant operators or Navy nuclear plant operators (eight individuals)
- Engineering degree with no previous operating experience (five individuals)

This is representative of the pool of plant personnel expected to operate in a NuScale control room and is consistent with the types of operators currently found in the existing nuclear industry (reference ACAD 10-001, Guidelines for Initial Training and Qualification of Licensed Operators). The three paths to control room licensed operator qualification in the existing industry are:

- Previously licensed commercial nuclear power plant operators (either SRO or RO)
- Non-licensed commercial nuclear power plant operators that have been selected as a candidate for license class training
- Individuals with engineering degrees that have been selected as direct SRO candidates

The NuScale ISV plant personnel have been specifically selected to represent the types of candidates that are currently selected to enter commercial nuclear license classes.

Two of the twenty two ISV plant personnel have had previous involvement with NuScale.

- One is a NuScale employee that has worked for the Probabilistic Risk Assessment (PRA) group in the Engineering Department. This individual has never been involved with the HSI or control room design and has no HFE design organization experience. This individual does have significant knowledge in regards to the physical plant design and PRA methodology and sequences.
- One was a former participant in the staffing plan validation conducted in August of 2016. This individual also worked as an operator at the NuScale Integrated System Test (NIST) facility and participated in initial screening and applicability review of Operating Experience items. This individual has never been involved with the HSI or control room design other than to provide feedback as a test participant.



Overall, the selected ISV plant personnel are a diverse yet representative sample of operators who are anticipated to interact with the NuScale HSI.

Impact on DCA:

There are no impacts to the DCA as a result of this response.