

## NuScaleDCRaisPEm Resource

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**From:** Chowdhury, Prosanta  
**Sent:** Sunday, March 18, 2018 10:29 PM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Cranston, Gregory; Murray, Demetrius; Kent, Lauren; D'Agostino, Amy  
**Subject:** Request for Additional Information No. 389 eRAI No. 9414 (18)  
**Attachments:** Request for Additional Information No. 389 (eRAI No. 9414).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response within 60 days of the date of this RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

Prosanta Chowdhury, Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-1647

**Hearing Identifier:** NuScale\_SMR\_DC\_RAI\_Public  
**Email Number:** 420

**Mail Envelope Properties** (Prosanta.Chowdhury@nrc.gov20180318222900)

**Subject:** Request for Additional Information No. 389 eRAI No. 9414 (18)  
**Sent Date:** 3/18/2018 10:29:20 PM  
**Received Date:** 3/18/2018 10:29:00 PM  
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**Post Office:**

Files	Size	Date & Time
MESSAGE	531	3/18/2018 10:29:00 PM
Request for Additional Information No. 389 (eRAI No. 9414).pdf		91231

**Options**

**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## **Request for Additional Information No. 389 (eRAI No. 9414)**

Issue Date: 03/19/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 18 - Human Factors Engineering

Application Section:

### **QUESTIONS**

18-23

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.

NUREG-0711, Section 11.4.3.2 (1) states, "The applicant should develop detailed test objectives to provide evidence that the integrated system adequately supports plant personnel in safely operating the plant, to include the following considerations:

- Validate the acceptability of the shift staffing level(s), the assignment of tasks to crew members, and crew coordination within the control room, between the control room and local control stations and support centers, and with individuals performing tasks locally. This should encompass validating minimum shift staffing levels, nominal levels, maximum levels, and shift turnover.
- Validate that the design has adequate capability for alerting, informing, controlling, and feedback such that personnel tasks are successfully completed during normal plant evolutions, transients, design-basis accidents, and also under selected, risk-significant events beyond-design basis, as defined by sampling operational conditions.
- Validate that specific personnel tasks can be accomplished within the time and performance criteria, with effective situational awareness, and acceptable workload levels that balance vigilance and personnel burden.
- Validate that the HSIs minimize personnel error and assure error detection and recovery capability when errors occur.

- Validate the assumptions about performance on important HAs.
- Validate that the personnel can effectively transition between the HSIs and procedures in accomplishing their tasks, and that interface management tasks, such as display configuration and navigation, are not a distraction or an undue burden.”

The applicant's test objectives are described in Section 4.2 of the Verification and Validation Implementation Plan. The objectives described correspond to those identified in the review criterion with the exception of the last bullet. Please explain how the final bullet in criterion 11.4.3.2 (1) is addressed or why it is not applicable to the NuScale design.