



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 4, 2018

MEMORANDUM TO: Samuel Lee, Chief
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

FROM: Prosanta Chowdhury, Project Manager */RA/*
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE
POWER, LLC DESIGN CERTIFICATION APPLICATION HUMAN
FACTORS ENGINEERING TOPICS

The U.S. Nuclear Regulatory Commission staff plans to conduct an audit of the supporting design and analysis documentation not provided on the docket that supports the NuScale Power, LLC (NuScale) descriptions of the human factors engineering program described in Final Safety Analysis Report Tier 1 and Tier 2, which was submitted in conjunction with the design certification application.

The purpose of the audit is to review, verify, and identify information and documentation that are needed for establishing design and licensing bases in making regulatory findings.

The audit will take place at NuScale Power located in Rockville, Maryland. The staff will also use NuScale's electronic reading room during the audit. The audit is scheduled to start on June 26, 2018, and end on June 28, 2018. The audit entrance will be held on June 26, 2018, at the audit location. The audit plan is provided as an enclosure.

Docket No.: 52-048

Enclosure:
As stated

cc: DC NuScale Power LLC Listserv

CONTACT: Prosanta Chowdhury, NRO/DNRL
(301) 415-1647

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE POWER, LLC DESIGN
CERTIFICATION APPLICATION HUMAN FACTORS ENGINEERING TOPICS
DATE JUNE 4, 2018

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ADAMS Accession No: ML18144A758 *via email NRO-002

OFFICE	NRO/DNRL/LB1/PM	NRO/DNRL/LB1/LA	NRO/DCIP/HOIB: BC	NRO/DNRL/LB1/PM
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DATE	05/24/2018	05/24/2018	06/01/2018	06/4/2018

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U.S. NUCLEAR REGULATORY COMMISSION
AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE POWER, LLC DESIGN
CERTIFICATION APPLICATION HUMAN FACTORS ENGINEERING TOPICS

APPLICANT: NuScale Power, LLC

APPLICANT CONTACT: Steve Mirsky
Steve Pope
Tim Tovar, et al.

DATE: June 26, 2018 to June 28, 2018

LOCATION: NuScale Power, LLC Office
11333 Woodglen Avenue, Suite 205
Rockville, MD 20852

AUDIT TEAM: Amy D'Agostino (RES/DRA/HFRB)
Brian Green (NRO/DCIP/HOIB)
Maurin Scheetz (NRO/DCIP/HOIB)

PROJECT MANAGER: Prosanta Chowdhury (NRO/DNRL/LB1)

PURPOSE

The purpose of this regulatory audit is for the U.S. Nuclear Regulatory Commission (NRC) staff to review, verify, and identify information and documentation that are needed for establishing design and licensing bases in making regulatory findings. The staff will review supporting design and analysis documentation not provided on the docket that supports the NuScale descriptions of the human factors engineering (HFE) program in Final Safety Analysis Report Tier 1 and Tier 2, which was submitted in conjunction with the design certification application.

BACKGROUND

In May 2017, the staff conducted a regulatory audit of HFE analyses results at the NuScale office in Rockville, MD (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17181A415). One of the goals of that audit was to confirm that the sample of results provided in various docketed HFE technical reports were representative of the much larger body of non-docketed results contained in the HFE databases. The staff found that several HFE analyses were still ongoing. The NRC staff informed NuScale on June 20, 2017, that the NRC staff will conduct a follow-up audit when the HFE Operating Experience Review (OER), Functional Requirements Analysis (FRA), Function Allocation (FA), and Task Analysis (TA) are complete such that (1) NuScale has resolved open items in the OER database, (2) identified functions have been allocated, and (3) tasks associated with the plant systems and events described in the Final Safety Analysis Report have been identified and analyzed if the tasks are in the scope of tasks to be analyzed. Following the May 2017 audit, the staff issued Request for Additional Information (RAI) 9123 (ADAMS Accession No. ML17307A448), to request that NuScale provide a timeline for the completion of these HFE analyses. On January 10, 2018, NuScale provided a response to RAI 9123 (ADAMS Accession No. ML18002A554) and proposed a follow-up audit be scheduled after June 4, 2018. In the response to RAI 9123, NuScale also provided the dates during which the integrated system validation (ISV) testing will be performed.

Enclosure

Additionally, the staff issued RAI 9312 (ADAMS Accession No. ML17356A005), requesting that NuScale provide the scenario guides that will be used during the integrated system validation testing for review. On January 25, 2018, NuScale provided a response to RAI 9312 (ADAMS Accession No. ML18011B134) and informed the staff that the scenario guides will be placed in the NuScale electronic reading room by June 1, 2018.

REGULATORY AUDIT BASIS

Subpart B of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "License, Certifications, and Approvals for Nuclear Power Plants," Section 52.47, "Contents of applications; technical information," requires that information submitted for a design certification (DC) 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). 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 of the Standard Review Plan (NUREG-0800) and NUREG-0711, "Human Factors Engineering Review Program," contain guidance the staff uses to assess whether an application complies with HFE-related NRC requirements.

NUREG-0711 describes the twelve elements of a human factors program. These elements include OER, FA, TA, and Verification & Validation (V&V), as well as other portions of the HFE program which are not considered in this audit. NUREG-0711 also provides guidance about the appropriate treatment of human engineering discrepancies (HEDs).

As part of the design certification application, NuScale submitted the following technical reports that are related to this audit:

- Operating Experience Review Results Summary Report (RSR)
- Functional Requirements Analysis/Function Allocation RSR
- Task Analysis RSR
- Verification and Validation Implementation Plan
- HFE Program Plan

REGULATORY AUDIT SCOPE

The scope of the audit includes the following activities:

1. Verify that the sample of results from human factors analyses (OER, FA, and TA) documented in docketed results summary reports are representative of the full set of HFE results documented in various NuScale databases.
2. Confirm that issues identified during the May 2017 audit (ADAMS Accession No. ML17181A415) have been resolved in accordance with the response to RAI 9123 (ADAMS Accession No. ML18002A554).
3. Confirm that HEDs identified during HFE analyses have been analyzed and resolved in accordance with NUREG-0711.
4. Review the V&V scenario guides to prepare for the integrated system validation audit.

INFORMATION AND OTHER MATERIAL NECESSARY FOR THE AUDIT

1. Access to the operating experience review, functional requirements analysis/function allocation and task analysis databases.
2. Access to NuScale staff who are knowledgeable about the results contained in the databases listed above. NuScale staff may use teleconference and webinar systems.
3. Access to the full set of ISV scenario guides in the electronic reading room at least one week prior to the scheduled audit. The staff may request specific scenario guides be printed for use onsite during the audit.
4. Access to the HED tracking system including a sample of results.

TEAM ASSIGNMENTS

Prosanta Chowdhury is the project manager.

The following team members will be responsible for reviewing human factors technical content:

- Brian Green
- Maurin Scheetz
- Amy D'Agostino

Other staff members may be added if the need arises.

LOGISTICS

The audit will be primarily conducted at the NuScale office in Rockville, MD with support from the NuScale Corvallis office.

The audit is scheduled to begin at noon (EDT) and end by 5 p.m. (EDT) on each day (June 26, 27, and 28, 2018).

The general format of the audit will include teleconferencing and videoconferencing with remotely located NuScale staff and NRC staff.

NRC staff may request documents be put into the electronic reading room prior to, or during the audit.

SPECIAL REQUESTS

None.

DELIVERABLES

The audit team will issue a regulatory audit summary report within 90 days after the completion of the audit that will be placed on the docket and in ADAMS. The audit outcome could also identify any additional information to be reviewed in a follow-up audit or submitted separately for making regulatory decisions.

REFERENCES

- NUREG-0711 - "Human Factors Engineering Program Review Model," (ADAMS Accession No. ML12324A013)
- RP-0316-17614 – "Human Factors Engineering Operating Experience Review Results Summary Report," (ADAMS Accession No. ML16364A342)
- RP-0316-17615 - Human Factors Engineering Functional Requirements Analysis and Function Allocation Results Summary Report Part 1 & Part 2 (ADAMS Accession Nos. ML16364A342 and ML16364A345)
- RP-0316-17616 – "Human Factors Engineering Task Analysis Results Summary Report Part 1 & Part 2 (ADAMS Accession No. ML17004A222)
- RP-0914-8543 – "Human Factors Verification and Validation Implementation Plan" (ADAMS Accession No. ML16364A348)
- RP-0914-8534 – "Human Factors Engineering Program Management Plan" (ADAMS Accession No. ML17004A222)