



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

April 26, 2019

MEMORANDUM TO: Samuel Lee, Chief
Licensing Branch 1
Division of Licensing, Siting
and Environmental Analysis
Office of New Reactors

FROM: Prosanta Chowdhury, Project Manager */RA/*
Licensing Branch 1
Division of Licensing, Siting
and Environmental Analysis
Office of New Reactors

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE
POWER, LLC PROPOSED INSPECTIONS, TESTS,
ANALYSES, AND ACCEPTANCE CRITERIA AND REVISED
DESIGN IMPLEMENTATION IMPLEMENTATION PLAN

The U.S. Nuclear Regulatory Commission (NRC) staff plans to conduct an audit of the proposed Human Factors Engineering (HFE) Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC) No. 1 in the Final Safety Analysis Report (FSAR) Tier 1, Table 3.15-1, "Human Factors Engineering Inspections, Tests, Analyses, and Acceptance Criteria," and associated revision to the FSAR Tier 2, Table 14.3-2, "Shared/Common Structures, Systems, and Components and Non-Structures, Systems, and components Based Design Features and Inspections, Tests, Analyses, and Acceptance Criteria Cross Reference," of the NuScale Power, LLC (NuScale) Design Certification Application (DCA). The purpose is to confirm that the proposed ITAAC No. 1 and the associated revision to Table 14.3-2, is appropriate for the NuScale design certification.

The NRC staff also plans to review NuScale's revised design implementation implementation plan to ensure that it clearly identifies the roles of NuScale and a combined license applicant and is consistent with NUREG-0711, "Human Factors Engineering Program Review Model."

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

The audit will take place at the NuScale Power, LLC Rockville office. The NRC staff plans to use NuScale's electronic reading room during the audit. The audit entrance will be held on April 29, 2019, via tele/videoconference. The audit plan is provided as an enclosure.

Docket No. 52-048

Enclosure:

1. Audit Plan

cc: DC NuScale Power LLC Listserv

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE POWER, LLC
 PROPOSED INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE
 CRITERIA AND REVISED DESIGN IMPLEMENTATION IMPLEMENTATION
 PLAN.

DATE: April 26, 2019

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ADAMS Accession No: ML19108A400 *via email NRO-002

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DATE	4/22/2019	4/22/2019	4/23/2019	4/26/2019

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**U.S. NUCLEAR REGULATORY COMMISSION
AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE POWER, LLC PROPOSED
ITAAC AND REVISED DESIGN IMPLEMENTATION IMPLEMENTATION PLAN**

APPLICANT: NuScale Power, LLC

APPLICANT CONTACT: Nadja Joergensen
Steve Pope
Tim Tovar, et al.

DATE: April 29, 2019 – April 30, 2019

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

AUDIT TEAM: Brian Green (NRR/DIRS/IRAB)
Maurin Scheetz (NRR/DIRS/IOLB)

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

PURPOSE

The purpose of this regulatory audit is for the U.S. Nuclear Regulatory Commission (NRC or Commission) staff to confirm that the proposed Human Factors Engineering (HFE) Inspection, Tests, Analyses, and Acceptance Criteria (ITAAC) No. 1 in the Final Safety Analysis Report (FSAR) Tier 1, Table 3.15-1, “Human Factors Engineering Inspections, Tests, Analyses, and Acceptance Criteria,” and associated revision to the FSAR Tier 2, Table 14.3-2, “Shared/Common Structures, Systems, and Components and Non-Structures, Systems, and components Based Design Features and Inspections, Tests, Analyses, and Acceptance Criteria Cross Reference,” of the NuScale Power, LLC (NuScale) Design Certification Application (DCA) are appropriate for the NuScale design certification. The other purpose of the audit is to ensure NuScale’s revised design implementation (DI) implementation plan clearly identifies the roles of NuScale and a combined license applicant and is consistent with NUREG-0711, “Human Factors Engineering Program Review Model.”

BACKGROUND

By letter dated December 31, 2016, NuScale submitted a DCA for review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The DCA includes FSAR Tier 2, Chapter 18, “Human Factors Engineering,” which describes the human factors engineering (HFE) program for the NuScale Power Plant (ADAMS Accession No. ML17013A289). Consistent with NUREG-0800, “Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants,” Chapter 18, “Human Factors Engineering,” the NRC staff is using the review criteria in NUREG-0711, “Human Factors Engineering Program Review Model,” Revision 3, to determine whether the NuScale design complies with HFE-related NRC requirements.

The HFE Program Review Model described in NUREG-0711 consists of 12 elements (refer to Figure 1-1, “Elements of the HFE program’s review model,” of NUREG-0711 for additional

information). FSAR Tier 2, Section 18.0, “Human Factors Engineering – Overview,” states the NuScale HFE program incorporates accepted HFE standards and guidelines including the applicable guidance provided in NUREG-0711, “Human Factors Engineering Program Review Model,” Revision 3. NuScale submitted two types of technical reports with the DCA to address the 12 elements in NUREG-0711, “Implementation Plans” (IPs) and Results Summary Reports (RSRs). NUREG-0711, Section 1.2.2, “Review Elements,” explains that IPs describe processes and methods for performing HFE activities, and RSRs describe the results of performing those activities.

NuScale submitted an IP for the design implementation element of the human factors program. NRC staff reviewed the IP and identified issues related to the submittal. These issues included problems with scope of the proposed ITAAC and the clarity of the DI IP regarding the combined license applicant’s role in the process. The staff issued Request for Additional Information (RAI) 9415 on April 23, 2018 (ADAMS Accession No. ML18204A190), to address these issues.

During two public meetings on August 7, 2018, and August 21, 2018, respectively, the staff provided feedback on NuScale’s response to RAI 9415 (ADAMS Accession No. ML18172A318). A summary of these two meetings can be found in ADAMS at Accession No. ML18235A137. Subsequently, the applicant proposed a supplemental response to RAI 9415, which was discussed in a public meeting on October 17, 2018 (ADAMS Accession No. ML18304A258). In this proposed supplemental RAI response, NuScale described a novel means of documenting the DI activities, which would, if approved allow an eventual combined license applicant to complete the DI activities without submitting an RSR as described in NUREG-0711, Section 12.3, “Applicant Submittals.”

On April 8, 2019, NuScale and NRC staff held another public meeting to address the submittal of a revised ITAAC and DI IP. At this meeting, NuScale agreed to put newly revised versions in their electronic reading room so that staff could review it and determine if there were significant remaining issues. The goal of this audit is to ensure that these documents, if submitted on the docket, will not have significant regulatory issues that could cause delays to completion of the Chapter 18 review.

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. NUREG-0800, Chapter 18, and NUREG-0711 contain guidance the NRC 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 design implementation activities, as well as other portions of the HFE program. As part of the DCA, NuScale submitted the following technical reports that are related to this audit:

- Design Implementation IP;

- FSAR Tier 1, Table 3.15-1, “Human Factors Engineering Inspections, Tests, Analyses, and Acceptance Criteria”;
- FSAR Tier 2, Table 14.3-2, “Shared/Common Structures, Systems, and Components and Non-Structures, Systems, and components Based Design Features and Inspections, Tests, Analyses, and Acceptance Criteria Cross Reference.”

REGULATORY AUDIT OBJECTIVES

The objectives of the audit include the following:

1. Confirm that ITAAC number 1 on Tier 1 Table 3.15-1 and the associated revision to FSAR Tier 2, Table 14.3-2 is appropriate for the NuScale design certification.
2. Review the revised design implementation IP to ensure that it clearly identifies the roles of NuScale and a combined license applicant and is consistent with NUREG-0711.

INFORMATION AND OTHER MATERIAL NECESSARY FOR THE AUDIT

1. Access to NuScale staff who are knowledgeable about the DI activities.
2. Access to the revised ITAAC table and any supporting documents.
3. Access to the revised DI IP and any supporting documents.

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

Other staff members may be added if the need arises.

LOGISTICS

The audit is scheduled to begin at 8:00 a.m. (EDT) on April 29, 2019, and end by 5:00 p.m. (EDT) on April 30, 2019.

The general format of the audit will include reviewing documents in the NuScale electronic reading room and conducting any briefs with the NuScale staff.

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

1. NUREG-0711, "Human Factors Engineering Program Review Model," Revision 3 (ADAMS Accession No. ML12324A013)
2. RP-0914-8544, "Human Factors Engineering Design Implementation, Implementation Plan," Revision 0 (ADAMS Accession No. ML15223A045)