



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

December 27, 2017

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

FROM: Omid Tabatabai, Senior Project Manager */RA/*
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: AUDIT PLAN FOR NUSCALE POWER, LLC, FINAL SAFETY
ANALYSIS REPORT – CHAPTER 20, “MITIGATION OF
BEYOND-DESIGN-BASIS EVENTS”

The purpose of this regulatory audit is to (1) gain a better understanding or confirm the staff's understanding of the detailed calculations, analyses, and bases underlying the NuScale Power, LLC (NuScale) final safety analysis report (FSAR) Chapter 20, “Mitigation of Beyond Design-Basis Events,” (2) verify information in the NuScale design certification application and evaluate its conformance with the applicable regulatory and guidance document, and (3) identify any information needed on the docket to support the basis of a reasonable assurance finding. This audit will be conducted consistent with the staff's enhanced safety focused review approach and apply audit resources consistent with a graded approach to safety and risk.

The audit will take place at NuScale's offices in Rockville, Maryland, and/or online via NuScale's electronic reading room. The audit is currently scheduled to start on January 8, 2018, and last thru January 31, 2018. The audit plan is provided in Enclosure 1.

Docket No. 52-048

Enclosure:
Regulatory Audit NuScale Reactor Systems

cc w/encl.: DC NuScale Power, LLC Listserv

CONTACT: Omid Tabatabai, NRO/DNRL
301-415-6616

SUBJECT: AUDIT PLAN FOR NUSCALE POWER, LLC, FINAL SAFETY ANALYSIS REPORT
CHAPTER 20, "MITIGATION OF BEYOND-DESIGN-BASIS EVENTS"
DATED: 12/27/2017

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UNITED STATES NUCLEAR REGULATORY COMMISSION
AUDIT PLAN FOR THE REGULATORY AUDIT OF
NUSCALE POWER, LLC DESIGN CERTIFICATION APPLICATION
CHAPTER 20, "MITIGATION OF BEYOND-DESIGN-BASIS EVENTS"

DOCKET NO. 52-048

AUDIT PLAN

APPLICANT: NuScale Power, LLC (NuScale)

APPLICANT CONTACT: Steven Mirsky

DURATION: January 8–31, 2018

LOCATION: U.S. Nuclear Regulatory Commission Headquarters
(via NuScale’s electronic reading room (eRR))
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11545 Rockville Pike
Rockville, MD 20852-2738

NuScale Power, LLC
11333 Woodglen Drive
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Rockville, MD 20852

AUDIT TEAM: Jeff Schmidt (NRO, Audit Lead)
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Jim Gilmer (NRO)
Omid Tabatabai (NRO, Senior Project Manager)

I. BACKGROUND AND OBJECTIVES

NuScale Power, LLC (NuScale) submitted by a letter dated December 31, 2016, to the U.S. Nuclear Regulatory Commission (NRC) a Final Safety Analysis Report (FSAR) for its

Enclosure

Design Certification (DC) application of the NuScale design (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The NRC staff initiated this DC review on March 27, 2017.

To facilitate the NRC staff's evaluation of information supporting the FSAR, and to complete its safety review of portions of FSAR Chapter 20, "Mitigation of Beyond-Design-Basis Events," and TR-0816-50797, "Mitigation Strategies for Extended Loss of AC Power Event" pertaining to reactor systems, the NRC staff is planning the following:

An audit entrance meeting on January 8, 2018, at NuScale's Rockville, Maryland office. The audit is expected to primarily be performed via the NuScale eRR or, if necessary, at NuScale's Rockville, Maryland office. During this audit, the NRC staff will examine the documents referenced and analyses mentioned in the FSAR, but not specifically cited, to support the applicant's statements in the FSAR and TR-0816-50797.

The objectives of this audit are for the NRC staff to:

1. gain a better understanding of the detailed calculations, analyses, and bases underlying NuScale's FSAR Chapter 20 and confirm the staff's understanding,
2. better understanding of the methodology and analysis supporting NuScale's extended long-term cooling (greater than 72 hours) conclusions in TR-0816-50797, and
3. develop requests for additional information (RAI).

The NRC staff determined efficiency gains would be realized by auditing documents that support the analysis presented in the FSAR to inform RAIs. During the audit and interactions with the applicant, the NRC staff may issue detailed RAIs separate from, but informed by, the audit. The staff will apply its enhanced safety focused review approach during the audit, and apply audit resources commensurate with the safety/risk significance of the area being audited.

II. REGULATORY AUDIT BASIS

Title 10 of the *Code of Federal Regulations*, Section 52.47(a)(2) states that a DC application must contain an FSAR that includes:

A description and analysis of the structures, systems, and components (SSCs) of the facility, with emphasis upon performance requirements, the bases, with technical justification therefor, upon which these requirements have been established, and the evaluations required to show that safety functions will be accomplished.

JLD-ISG-2012-01 states: Section 3.2.1.7 of Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 2, specifies that strategies "that have a time constraint to be successful should be identified and a basis provided that the time can reasonably be met."

Also, NEI 12-06, Section 3.2.1, "General Criteria and Baseline Assumptions," provides the general criteria and assumptions to be used in establishing the baseline coping strategy. Past regulatory precedence have included the need for reactor designs, including other passive designs, to demonstrate the success of the strategies or include the ability to indicate core conditions.

An audit is needed to confirm the basis for the safety conclusions made in the applicant's Chapter 20 mitigation strategies for extended loss of AC power transient analyses.

III. REGULATORY AUDIT SCOPE

The scope of this audit includes information, documents, and supporting calculations related to the FSAR Chapter 20 transient analyses for the mitigation strategies for extended loss of AC power. In addition to the initial set of audit documents and information requested in Attachment A, the NRO staff may request other information as needed to achieve audit objectives. These documents will be listed as references in the audit report prepared by the staff following the conclusion of the audit.

IV. SPECIAL REQUESTS

The NRC staff requests the documents listed in Attachment A be available to the NRC auditors in NuScale's eRR. Use of the eRR allows multiple NRC staff reviewers to examine the same document at the same time, which improves the efficiency and reduces the cost of the audit. Additional documents may be identified as the review progresses. When the staff's review of the documents associated with a specific issue is complete, the staff will notify either the NRC's Division of New Reactor Licensing (DNRL) or NuScale that these documents can be removed from the eRR, thereby minimizing their residence time in the eRR.

In addition, the NRC staff may request in-person audit meetings with NuScale personnel to facilitate the staff's understanding of material to be audited. Such meetings will be scheduled based on mutual availability. The NRC staff requests that document titles identified by the NRC staff that are germane to an in-person audit meeting be made available in the eRR prior to any scheduled in-person audit meeting.

V. REQUESTED DOCUMENTS

1. EC-0000-3070, "Station Blackout Analysis" and any other documentation which supports the development of this document.
2. EC-B175-3252, "UHS Boil Off Calculation" and any other documentation which supports the development of this document.
3. EC-A010-4270, "Long Term Cooling Analysis," and any other documentation which supports the development of this document.
4. EC-0000-4576, "Reduction of Collapsed Primary Water Level in LTC due to Loss of Inventory" and any other documentation which supports the development of this document.
5. In addition to the above, NuScale needs to identify and provide the NRC staff access to any other calculation(s) that support NuScale's Technical Report TR-0816-50797-NP, "Mitigation

Strategies for Extended Loss of AC Power Event” (ADAMS Accession No. ML17005A148 for non-public and ML17005A120 for publicly available).

VI. AUDIT ACTIVITIES AND DELIVERABLES

The NRC audit team is expected to consist of aforementioned individuals covering the technical areas affecting Chapter 20 FSAR Sections covered by the requests in Attachment A. The NRC staff will conduct this audit in accordance with the guidance provided in NRO-REG-108, “Regulatory Audits” (Reference 2). The NRC staff acknowledges the proprietary nature of the information requested and will handle it appropriately throughout the audit. While the NRC staff will take notes, the NRC staff will not remove hard copies or electronic files from the audit site(s).

The audit will assist the NRC staff in the issuance of RAIs (if necessary) for the licensing review of the FSAR Sections identified above in preparation of the NRC staff’s safety evaluation.

If necessary, any concerns related to the conduct of the audit will be communicated to Omid Tabatabai (NRC) at 301-415-6616 or Omid.Tabatabai@nrc.gov.

VII. REFERENCES

1. Letter from NuScale Power, LLC, “NuScale Power, LLC Submittal of the NuScale Standard Plant Design Certification Application,” December 31, 2016 (ADAMS Accession No. ML17013A229).
2. NRO-REG-108, “Regulatory Audits,” April 2, 2009 (ADAMS Accession No. ML081910260).