

November 7, 2017

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

FROM: Marieliz Vera, 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 SPECIFICATIONS FOR SEISMIC
CATEGORY I EQUIPMENT

On January 6, 2017, NuScale Power, LLC (NuScale) submitted a design certification (DC) application for a small modular reactor to the U.S. Nuclear Regulatory Commission (NRC) (Agencywide Documents Access and Management System Accession No. ML17013A229). The NRC staff started its detailed technical review of NuScale's DC application on March 15, 2017.

The purpose of the subject audit, to be conducted by the NRC staff, is to: (1) gain a better understanding of the NuScale design; (2) verify information; (3) identify information that may require docketing to support the basis of the licensing or regulatory decision; and (4) review related documentation and non-docketed information to evaluate conformance with regulatory guidance and compliance with NRC regulations.

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 November 8, 2017, and last for 30 days. The audit plan is enclosed.

Docket No. 52-048

Enclosures:

1. Audit Plan
2. Documents necessary for the audit

CONTACT: Marieliz Vera, NRO/DNRL
301-415-5861

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

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE POWER, LLC;
DESIGN SPECIFICATIONS FOR SEISMIC CATEGORY I EQUIPMENT
DATED: 11/07/2017

DISTRIBUTION:

PUBLIC

SLee, NRO

MVera, NRO

TLupold, NRO

MBreach, NRO

GCranston, NRO

RidsNroDsra

RidsOgcMailCenter

RidsAcrcAcnwMailCenter

ADAMS Accession No: ML17307A382

*via email

NRO-002

OFFICE	NRO/DNRL/LB1: PM	NRO/DNRL/LB1: LA	NRO/DNRL/LB1: PM
NAME	MVera	SGreen	MVera
DATE	11/04/2017	11/06/2017	11/07/2017

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION
REGULATORY AUDIT OF DESIGN SPECIFICATIONS
FOR SEISMIC CATEGORY I EQUIPMENT

NUSCALE STANDARD PLANT DESIGN CERTIFICATION
Docket No. 52-048

AUDIT PLAN

APPLICANT: NuScale Power, LLC

APPLICANT CONTACTS: Marty Bryan, NuScale

DURATION: November 8, 2017 – December 8, 2017

LOCATION: U.S. NRC Rockville Office
11545 Rockville Pike
Rockville, MD 20852-2738

Electronic Reading Room (eRR)

AUDIT TEAM: Michael R. Breach, Mechanical Engineer (NRC), Audit Lead
Tuan D. Le, NRO, Mechanical Engineer (NRC)
Thomas G. Scarbrough, Sr. Mechanical Engineer (NRC)
Jorge A. Cintron-Rivera, Electrical Engineer (NRC)
Sheila Ray, Electrical Engineer (NRC)
Marieliz Vera Amadiz, Project Manager (NRC)

I. BACKGROUND

On March 15, 2017, the U.S. Nuclear Regulatory Commission (NRC) accepted the design certification application (DCA) for docketing for the NuScale Power, LLC (NuScale) Standard Plant Design Certification (DC) Application for a small module reactor (SMR) design submitted by NuScale, LLC. (NuScale) (Reference 1).

The NRC staff determined that efficiency gains would be realized by auditing the documents supporting the NuScale SMR design presented in the NuScale Final Safety Analysis Report (FSAR), in lieu of multiple requests for additional information (RAIs) for the applicant to submit design specifications and calculation files. The purpose of this audit is to allow the NRC technical staff to gain an understanding of the supporting design specifications and design calculations to better focus the staff's inquiries to the applicant. During the audit and interactions with the applicant, there may be detailed RAIs developed, which would be part of a future formal correspondence.

II. PURPOSE

The purpose of the audit is to verify that the Seismic Category I Mechanical and Electric Equipment qualifications in support of the NuScale Standard Plant DC application are being performed in accordance with the methodology and criteria described in the NuScale FSAR.

III. REGULATORY AUDIT BASIS

The audit basis is to confirm that the NuScale SMR Seismic Category I Mechanical and Electric Equipment qualification is being performed consistent with the NuScale DC application and applicable NRC regulatory guides.

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," Section 47, "Contents of Applications; Technical Information," states the following:

The application must contain a level of design information sufficient to enable the Commission to judge the applicant's proposed means of assuring that construction conforms to the design and to reach a final conclusion on all safety questions associated with the design before the certification is granted. The information submitted for a DC must include performance requirements and design information sufficiently detailed to permit the preparation of acceptance and inspection requirements by the NRC, and procurement specifications and construction and installation specifications by an applicant. The Commission will require, before DC, that information normally contained in certain procurement specifications and construction and installation specifications be completed and available for audit if the information is necessary for the Commission to make its safety determination.

The NRC staff will review the design specifications for select Seismic Category I Mechanical and Electrical equipment and the seismic qualification methods and criteria described in the NuScale FSAR:

- Section 3.9.6, "Functional Design, Qualification, and In-service Testing Programs for Pumps, Valves, and Dynamic Restraints"
- Section 3.10, "Seismic and Dynamic Qualification of Mechanical and Electrical Equipment"

The staff will conduct this audit in accordance with the guidance provided in the Office of New Reactors (NRO)-REG-108, "Regulatory Audits" (Reference 2).

IV. REGULATORY AUDIT SCOPE

The primary scope of this audit is the review of design specifications for Seismic Category I Mechanical and Electrical equipment described in the NuScale FSAR to confirm that proper seismic qualification requirements are contained in the design specifications.

V. DOCUMENTS/INFORMATION NECESSARY FOR THE AUDIT

Design specifications for the following seismic category I mechanical and electrical equipment are to be made available to the NRC staff, in the NuScale electronic reading room (eRR):

Please see Enclosure 2

Appropriate handling and protection of proprietary information shall be acknowledged and observed throughout the audit.

VI. SPECIAL REQUESTS

The NRC staff requests that NuScale provide the technical staff with access to the audit documents. NuScale can upload the requested documents into the NuScale eRR for staff's review. During the audit, the staff will have questions and discussion items for the NuScale subject matter experts. When the staff's review of the documents associated with a specific issue is complete, the staff will notify either the NRO, Division of New Reactor Licensing or NuScale that these documents can be removed from eRR thereby minimizing their residence time in eRR.

VII. AUDIT ACTIVITIES AND DELIVERABLES

The NRC audit team review will cover the technical areas identified in Section V of this audit plan. Depending upon the effort needed in a given area, NRC team members may be reassigned to ensure adequate coverage of important technical elements.

The regulatory audit will be scheduled for November 8 through December 8, 2017 from 7:30 AM to 3:30 PM, at the U.S. NRC Rockville Office, 11545 Rockville Pike, Rockville, MD 20852-2738. At the end of the audit, a technical audit summary will be sent by the technical reviewers to the NRC Project Manager (PM) for prompt issuance to the applicant as well as a public version of the same.

The NRC PM will coordinate with NuScale in advance of audit activities to verify specific documents and identify any changes to the audit schedule and requested documents.

The audit entrance/exit meetings and weekly audit meeting are to be scheduled as followings: Entrance Meeting – November 8, 2017; Exit Meeting: December 8, 2017.

Weekly Audit Meeting as needed: Friday 11:00 AM – 12:00 PM EDT.

The NRC staff acknowledges the proprietary nature of the information requested. It will be handled 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.

The NRC will hold weekly audit calls and/or meetings with NuScale to identify issues that have been closed or will be resolved by another mechanism, such as RAIs or public meetings. In the weekly meetings, NRC will also identify any new emerging information needs as well as documents that can be removed from eRR.

At the completion of the audit, the audit team will issue an audit summary within 90 days that will be declared and entered as an official agency record in the NRC's Agencywide Documents Access and Management System (ADAMS) records management system.

The audit outcome may be used to identify any additional information to be submitted for making regulatory decisions, and it will assist the NRC staff in the issuance of RAIs (if necessary) for the licensing review of NuScale FSAR Chapter 3 and any related information provided in other chapters, in preparation of the NRC's Safety Evaluation Report.

If necessary, any circumstances related to the conductance of the audit will be communicated to Marieliz Vera Amadiz, NRC at 301-415-5861 or email: Marieliz.VeraAmadiz@nrc.gov

VIII. REFERENCES

1. NRC Letter, "NuScale Power, LLC. – Acceptance of an Application for Standard Design Certification of a Small Modular Reactor," ADAMS Accession Number ML17074A087, March 23, 2017.
2. NRO-REG-108, "Regulatory Audits," ADAMS Accession Number ML081910260, April 2, 2009.
3. NuScale Standard Plant DC Application, Revision 0, December 2016.

Documents necessary for the audit

Component Name	Safety and Risk Classification	Seismic Class
1.4 Containment System (CNT-A013)		
MS #1 CIV (MSIV #1)	A1	I
MS #2 CIV (MSIV #2)	A1	I
MS line #1 Bypass Valve (MSIV Bypass #1)	A1	I
MS line #2 Bypass Valve (MSIV Bypass #2)	A1	I
FW #1 CIV (FWIV #1)	A1	I
FW #2 CIV (FWIV #2)	A1	I
CVC Discharge CIV	A1	I
CVC Injection CIV	A1	I
CVC PZR Spray CIV	A1	I
RPV High Point Degas CIV	A1	I
RCCW Supply CIV	A1	I
RCCW Return CIV	A1	I
CE CIV	A1	I
CFDS CIV	A1	I
Thermal relief valves	A2	I
2.1 Chemical and Volume Control System (CVCS-		
DWS Supply Isolation Valve	A1	I
DWS Supply Isolation Valve	A1	I
Pressurizer Spoolpiece Drain Valve	B2	I
Injection Spoolpiece Drain Valve	B2	I
Discharge Spoolpiece Isolation Valve	B2	I
Discharge Spoolpiece Drain Valve	B2	I
RPV High Point Degasification Spoolpiece Drain Valve	B2	I
RPV High Point Degasification Isolation Valve	B2	I
Spray Check Valve	B2	I
Injection Check Valve	B2	I
2.4 Emergency Core Cooling System (ECCS-B020)		
Reactor Vent Valve	A1	I
Reactor Recirculation Valve	A1	I
RVV Trip Valve	A1	I

RRV Trip Valve	A1	I
Reset Valve	A1	I
2.5 Decay Heat Removal System (DHRS-B030)		
DHRS Actuation Valve (2 per side)	A2	I
3.2 Condensate and Feedwater System (FWS-C020)		
Feedwater Regulating Valve A/B	B2	I
Feedwater Regulating Valve A/B Limit Switch	B2	I
Feedwater Supply Check Valve	B2	I