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

July 29, 2024

MEMORANDUM TO: Mahmoud Jardaneh, Chief
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

FROM: Getachew Tesfaye, Senior Project Manager **/RA/**
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

SUBJECT: UPDATED - AUDIT PLAN FOR THE STAFF REVIEW OF THE NUSCALE POWER, LLC STANDARD DESIGN APPROVAL APPLICATION – NUSCALE US460 DESIGN

By letter dated October 31, 2023, NuScale Power, LLC (NuScale) submitted Standard Design Approval Application (SDAA), Revision 1 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23306A033). The associated topical reports (TRs) that are being reviewed with the SDAA are: TR-0516-49422, "Loss of Coolant Accident (LOCA) Evaluation Model," Revision 3 (ML23008A002); TR-0516-49416, "Non-LOCA Transient Analysis Methodology," Revision 4 (ML23005A305); TR-124587, "Extended Passive Cooling and Reactivity Control Methodology," Revision 0 (ML23005A308); and TR-131981, "Methodology for the Determination of the Onset of Density Wave Oscillations (DWO)," Revision 1 (ML23212B224). The U.S. Nuclear Regulatory Commission (NRC) staff issued the initial audit plan for the SDAA safety review on March 22, 2023 (ML23067A300). This update to that audit plan adds a new phase to disposition already identified issues for High Effort chapters and their supporting topical and technical reports. The update will also reflect the current status of the audit activities, including identifying the chapters for which the audit has been completed.

The audit began on March 27, 2023, with an Entrance meeting. The audit is being conducted primarily via the established NuScale Electronic Reading Room and at NuScale's offices in Rockville, Maryland and Corvallis, Oregon. To date, the staff has issued two audit status letters where information that need to be submitted on the docket has been identified (ML23151A119 and ML24138A200). The contents of the updated audit plan are provided as an enclosure to this memorandum.

Docket No. 05200050

Enclosure:
Audit Plan

cc w/encl: NuScale Power, LLC Listserv

CONTACT: Getachew Tesfaye, NRR/DNRL
301-415-8013

SUBJECT: AUDIT PLAN FOR THE STAFF REVIEW OF THE NUSCALE POWER, LLC STANDARD DESIGN APPROVAL APPLICATION – NUSCALE US460 DESIGN DATED: JULY 29, 2024

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ADAMS Accession No: ML24211A089 ***via email** **NRR-106**

OFFICE	DNRL/NRLB: PM	DNRL/NLIB: LA	DNRL/NRLB: BC	DNRL/NRLB: PM
NAME	GTesfaye	SGreen*	MJardaneh *	GTesfaye
DATE	07/27/2024	07/29/2024	07/29/2024	07/29/2024

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UNITED STATES NUCLEAR REGULATORY COMMISSION

AUDIT PLAN FOR THE STAFF REVIEW OF THE NUSCALE POWER, LLC STANDARD DESIGN APPROVAL APPLICATION – NUSCALE US460

DOCKET NO. 05200050

AUDIT PLAN

APPLICANT:

NuScale Power, LLC (NuScale)

CONTACTS:

Licensing Manager: Thomas Griffith

Licensing Supervisors: Jim Osborn, Wren Fowler, Elisa Fairbanks, Amanda Bode

DURATION:

Phase A: **High** Effort Chapters (1, 3.7, 3.8, 3.9.2, 4, 5, 6, 8.3, 15, 16, 17.4, 19.1- 19.3) and applicable Technical and Topical Reports – March 27, 2023, through August 31, 2024

Phase A: **Medium** Effort Chapters (3 except 3.7, 3.8, 3.9.2, 7, 8 except 8.3, 9, 12, 14, 19.4, 19.5) and applicable Technical Reports – March 27, 2023, through December 27, 2023 [Completed]

Phase A: **Low** Effort Chapters (2, 10, 11, 13, 17 except 17.4, 18,) and applicable Technical Reports – March 27, 2023, through June 27, 2023 [Completed]

LOCATION:

U.S. Nuclear Regulatory Commission (NRC) Headquarters
(via NuScale Electronic Reading Room (eRR))
One White Flint North
11545 Rockville Pike
Rockville, Maryland 20852-2738

NuScale
11333 Woodglen Drive, Suite 205
Rockville, Maryland 20852

NuScale
1100 NE Circle Blvd
Corvallis, Oregon 97330

AUDIT TEAM (Project Managers):

Mahmoud Jardaneh (Branch Chief)	Ricky Vivanco	David Drucker
Getachew Tesfaye (Project Lead)	Thomas Hayden	Dennis Galvin
Stacy Joseph	Prosanta Chowdhury	Greg Cranston
Alina Schiller	River Rohrman	

AUDIT TEAM (Technical Branch Chiefs):

Branch Chief	**Branch**	**Branch Chief**	**Branch**
Wendell Morton	DEX/EEEB	Milton Valentin	DSS/SCPB
Stewart Bailey	DEX/EMIB	Shivani Mehta	DSS/STSB
Jason Paige	DEX/ELTB	Angie Buford	DNRL/NVIB
Fanta Sacko	DEX/EICB	Matthew Mitchell	DNRL/NPHP
Ian Tseng	DEX/ESEB	Steven Bloom	DNRL/NCSG
Barbara Hayes	DEX/EXHB	James Anderson	DRO/IOLB
Evan Davidson	DRA/APLB	Kerri Kavanagh	DRO/IQVB
Shilp Vasavada	DRA/APLC	Kenneth Erwin	NMSS/REFS/ERNRB
Kevin Hsueh	DRA/ARCB	Jessie Quichocho	NSIR/DPR/RLB
Rebecca Patton	DSS/SNRB	Mario Fernandez	NSIR/DPCP/CSB
Phillip Sahd	DSS/SNSB	Amanda Marshall	NSIR/DPCP/RSB
Scott Krepel	DSS/SFNB		

I. BACKGROUND AND OBJECTIVES

By letter dated October 31, 2023, NuScale Power, LLC (NuScale) submitted Standard Design Approval Application (SDAA), Revision 1 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23306A033). The associated topical reports (TRs) that are being reviewed with the SDAA are: TR-0516-49422, "Loss of Coolant Accident (LOCA) Evaluation Model," Revision 3 (ML23008A002); TR-0516-49416, "Non-LOCA Transient Analysis Methodology," Revision 4 (ML23005A305); TR-124587, "Extended Passive Cooling and Reactivity Control Methodology," Revision 0 (ML23005A308); and TR-131981, "Methodology for the Determination of the Onset of Density Wave Oscillations (DWO)," Revision 1 (ML23212B224). The purpose of this audit is for the NRC staff to conduct the staff's safety review of the NuScale SDA application in such a manner that identified issues can readily and easily be discussed and closed-out in order to provide a more predictable review schedule. The audit also achieves a more effective and efficient review by allowing the staff to review and discuss supporting material with the objective of improving communication and eliminating unnecessary requests for additional information. The staff audits material that may be needed to make a reasonable assurance finding that the design protects public health and safety. If the NRC staff identifies information that is needed to support a finding, NuScale submits that information on the application docket.

The NRC staff issued the initial audit plan for the SDAA safety review on March 22, 2023 (ML23067A300). This update to that audit plan adds a new phase to disposition already identified issues for High Effort chapters and their supporting topical and technical reports (see "DURATION" above). The update will also reflect the current status of the audit activities, including identifying the chapters for which the audit has been completed.

II. REGULATORY AUDIT BASIS

This regulatory audit is primarily based on Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants."

- 10 CFR Subpart E - Standard Design Approvals
    - § 52.131 Scope of subpart.
    - § 52.133 Relationship to other subparts.
    - § 52.135 Filing of applications.
    - § 52.136 Contents of applications; general information.
    - § 52.137 Contents of applications; technical information.
    - § 52.139 Standards for review of applications.
    - § 52.141 Referral to the Advisory Committee on Reactor Safeguards.
    - § 52.143 Staff approval of design.
    - § 52.145 Finality of standard design approvals; information requests.
    - § 52.147 Duration of design approval.

III. REGULATORY AUDIT SCOPE

The audit covers all parts of the NuScale SDA application (ML23306A033) and all parts of the following four topical reports: (1) TR-0516-49422, "Loss-of-Coolant Accident [LOCA] Evaluation Model," Revision 3 (ML23008A002); (2) TR-0516-49416, "Non-Loss-of-Coolant Accident Analysis Methodology," Revision 4 (ML23005A305); (3) TR-124587, "Extended Passive Cooling and Reactivity Control Methodology," Revision 0 (ML23005A308); and (4) TR-131981,

"Methodology for the Determination of the Onset of Density Wave Oscillations (DWO)," Revision 1 (ML23212B224).

IV. INFORMATION AND OTHER MATERIAL NECCSSARY FOR THE REGULATORY AUDIT

NuScale should be prepared to provide documents, reports, calculations, computer code verification, and other material, as applicable, supporting the analyses documented in the respective chapters of NuScale SDAA Final Safety Analysis Report (FSAR), and technical and topical reports. The NRC staff may request that NuScale make these additional materials available in the eRR and/or as a computer disc to be submitted on the docket.

V SPECIAL REQUESTS

NuScale and NRC have discussed and agreed upon the following audit logistics:

- NuScale creates Certrec eRR portal for document viewing.
    - NuScale to set up access for NRC participants once the staff emails are communicated.
- Weekly schedule for audit activities
    - Friday – NRC PMs submits audit issues (via email)
    - Monday – NuScale addresses issues
    - Tuesday/Wednesday/Thursday – standing audit meetings
    - Thursday/Friday – NuScale posts issue responses in eRR
- During the standing audit meetings NuScale and NRC staff will:
    - Clarify audit issues
    - Discuss audit issue resolutions
    - Discuss additional document needs
    - Discuss and decide on timeframe for issue resolution
        - Expectation is < 30 days for response to be posted to eRR.
        - Other timelines to be developed if necessary for a complete resolution.
    - Determine if a docketed response is required.
- NRC to track status of audit issues (internal spreadsheet).
    - NRC to provide NuScale a copy of the current tracker on Fridays.
    - Ensure mutual alignment during weekly standing meetings.
- NuScale to develop issue responses to audit questions.
- Written responses will be uploaded to Certrec eRR on Thursdays/Fridays.
    - NRC PMs will be notified via email when responses are available.
    - Associated NuScale documents requested in the audit will be available in eRR for viewing.
- NRC to review audit issue responses and documentation in eRR.

- Feedback on audit issue responses and discussion to be held in weekly standing meetings.
- NRC approval or rejection of audit issue responses communicated verbally.
    - If issue response is approved, the NRC staff determines if the response needs to be submitted on the docket.
    - NRC will periodically issue an administrative request for additional information (RAI) for issues resolved in eRR and submittal on the docket is needed.
    - If response is rejected, NuScale returns to internal response development steps.
- Responses will be posted twice before moving questions to formal RAI process.
    - This is a guideline that can be adjusted if necessary to cycle minor changes.
    - Once original response and one revised response are posted, further cycles will be moved to RAI process.
- NuScale to request NRC elevation audit issue to RAI process via email.
- The RAI process will be used when:
    - NRC requires formal docketing of a response
    - completion of the response will extend past the audit close date
    - requested by NuScale or NRC
- NRC will send formal RAI to NuScale via email
- RAI clock starts on the day the question is sent
    - < 30 days from receipt to response posted in eRR
- NuScale will respond to RAI questions:
    - Does the RAI contain proprietary, export control, or security related information?
    - Is clarification needed?
    - Is the 30-day response timeline achievable?

NuScale responses to RAIs will be submitted electronically to the NRC docket.

VI DELIVERABLES

The NRC audit team is expected to be composed of the above listed project managers along with a multi-faceted group of NRC technical reviewers and contractors. The NRC staff acknowledges the proprietary nature of the information requested and will handle it in

accordance with agency policies and procedures 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 started on March 27, 2023, and will end based on a chapters'/sections' "level of effort" designation of Low, Medium, or High (see "DURATION" above).

The NRC will inform NuScale of emerging information needs as well as documents that can be removed from eRR.

Five audit reports will be generated at the completion of the audit for the SDAA and the four supporting TRs. The audit report will include a link for audit status letters and all docketed materials requested by the staff during the audit.

The NRC point of contact for communicating questions or comments related to the conduct of the audit is Mr. Getachew Tesfaye, who can be reached at 301-415-8013 or via email at Getachew.tesfaye@nrc.gov.