



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

May 8, 2018

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

FROM: Anthony W. Markley, Senior Project Manager /RA/
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: AUDIT PLAN FOR THE PHASE II REGULATORY AUDIT OF THE
GASEOUS AND LIQUID EFFLUENT REPLACEMENT
METHODOLOGY CONCERNING THE RADIOACTIVE WASTE
MANAGEMENT SYSTEM FOR NUSCALE POWER, LLC

NuScale Power, LLC (NuScale) submitted by letter dated December 31, 2016, to the U.S. Nuclear Regulatory Commission (NRC), a Design Control Document for its Design Certification application (DCA) of the NuScale design (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The NRC staff started its detailed technical review of NuScale's DC application on March 27, 2017.

During Phase I of the DCA review, the staff conducted an audit of the Radioactive Waste Management System. The audit was conducted in accordance with the NRC's Office of New Reactors (NRO) Office Instruction, NRO-REG-108, "Regulatory Audits" (ADAMS Accession No. ML081910260). The audit was conducted from June 20, 2017, through November 14, 2017, in accordance with the audit plan (ADAMS Accession No. ML17159A799). The results of this audit are documented in, "Audit Summary for the Regulatory Audit of the Radioactive Waste Management System for NuScale Power, LLC" (ADAMS Accession No. ML18103A198).

The purpose of this Audit Plan for the focused NRC Phase II Regulatory Audit of the NuScale Gaseous and Liquid Effluent (GALE) Replacement Methodology concerning the Radioactive Waste Management System aspects of the design chapter is to support the NRC staff's review of the NuScale Effluent Release (GALE Replacement) Methodology. It will also facilitate the NRC staff's evaluation of the applicant's responses to electronic Request for Additional Information (eRAI) 9161, eRAI 9253, and eRAI 9239. The audit process will allow the staff to access limited support documentation that it has identified as potentially significant to the review, such as specific calculation packages, and non-docketed information in NuScale's Electronic Reading Room.

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This audit will take place at NuScale's offices, in Rockville, Maryland, and/or via the NRC staff's review of electronic information to which NuScale grants electronic access to the staff. The audit is currently scheduled to start on May 14, 2018, and end on July 27, 2018. The audit plan is provided as an enclosure.

Docket No. 52-048

Enclosure:

1. Audit Plan

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

SUBJECT: AUDIT PLAN FOR THE PHASE II REGULATORY AUDIT OF THE GASEOUS AND LIQUID EFFLUENT REPLACEMENT METHODOLOGY CONCERNING THE RADIOACTIVE WASTE MANAGEMENT SYSTEM FOR NUSCALE POWER, LLC
 DATED: 5/08/2018

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ADAMS Accession No.: ML18116A603

NRO-002

OFFICE	NRO/DSEA/RPAC	NRO/DNRL/LB1: LA	NRO/DNRL/LB1: PM
NAME	M. Dudek	M. Moore	A. Markley
DATE	4/3/2018	4/30/2018	5/08/2018

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U.S. NUCLEAR REGULATORY COMMISSION REGULATORY
AUDIT PLAN FOR THE PHASE II REGULATORY AUDIT OF THE GASEOUS AND LIQUID
EFFLUENT REPLACEMENT METHODOLOGY CONCERNING THE RADIOACTIVE
WASTE MANAGEMENT SYSTEM OF THE NUSCALE POWER, LLC
DESIGN CONTROL DOCUMENT DESIGN CERTIFICATION

DOCKET NO. 52-048

AUDIT PLAN

APPLICANT: NuScale Power, LLC (NuScale)

APPLICANT CONTACTS: Steve Mirsky (NuScale)

DURATION: May 14, 2018, through July 27, 2018

LOCATION: NuScale Rockville Office
11333 Woodglen Drive, Suite 205
Rockville, Maryland 20852

AUDIT TEAM: Richard Clement (NRO, Audit Lead)
Zachary Gran (NRO)
Stephen Williams (NRO)
Michael Dudek (NRO/RPAC Branch Chief)
Anthony Markley (NRO)
Getachew Tesfaye (NRO)
Supporting staff (As needed)

I. BACKGROUND

By letter dated December 31, 2016, NuScale submitted a Design Control Document for its Design Certification Application (DCA) of the NuScale Power, LLC (NuScale) design to the U.S. Nuclear Regulatory Commission (NRC) for review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). On March 15, 2017, the NRC staff accepted the DCA for docketing and initiated its technical review.

During Phase I of the DCA review, the staff conducted an audit of the Radioactive Waste Management System aspects of the DCA. The audit was conducted in accordance with the NRC's Office of New Reactors (NRO) Office Instruction, NRO-REG-108, "Regulatory Audits" (ADAMS Accession No. ML081910260). The audit was conducted from June 20, 2017, through November 15, 2017, in accordance with "Audit Plan for the Regulatory Audit of Chapter 11, "Radioactive Waste Management" For NuScale Power, LLC," (ADAMS Accession No.

ML17159A685). The results of this audit is documented in, "Audit Summary for the Regulatory Audit of the Radioactive Waste Management System for NuScale Power, LLC" (ADAMS Accession No. ML18103A198).

To facilitate the NRC staff's evaluation of information related to the safety analyses and assessment of the GALE Replacement Methodology, the NRC staff proposes this Audit Plan associated with the focused NRC's Phase II Regulatory Audit that includes:

- A regulatory audit that will commence on May 14, 2018. The audit will take place at NuScale's offices, in Rockville, Maryland, and/or via the NRC staff review of electronic information to which NuScale grants access. During this audit the NRC staff will examine in a sampling approach limited support documentation that it has identified as potentially significant to the review, such as specific calculation packages, and non-docketed information associated with the GALE Replacement Methodology. The NRC staff anticipates reviewing those calculations associated with the CRUD corrosion production calculations, water activation calculations, reactor coolant and secondary coolant activity calculations, pool source term calculations, chemical and volume control system (CVCS) source term calculations, waste tank source term calculations, liquid tank failure analysis, gaseous system failure analysis, and offsite dose calculations to understand the GALE Replacement Methodology proposed by NuScale in verifying radioactive source terms used in performing effluent dose calculations.

II. PURPOSE AND REGULATORY BASIS

The purpose of this Audit Plan for the focused NRC Phase II Regulatory Audit of the Gaseous and Liquid Effluent (GALE) Replacement Methodology concerning the Radioactive Waste Management System aspects of the design is to:

- Support the NRC staff's review of the GALE Replacement Methodology by allowing the staff to access limited support documentation that it has identified as potentially significant to the review, such as specific calculation packages, and non-docketed information in NuScale's Electronic Reading Room (eRR).

The NRC staff determined efficiency gains would be realized by auditing the documents supporting the information presented in the DCA as well as in the responses to RAIs, and would be effective in identifying specific information needs to support necessary regulatory findings. During the audit and interactions with the applicant, there may be additional detailed NRC requests for information developed which could be part of future formal correspondence.

The Design Specific Review Standard (DSRS) and NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition" (SRP) are not a substitute for NRC regulations and compliance with it is not required. As an alternative, an applicant may identify the differences between a DSRS section and the design features, analytical techniques, and procedural measures proposed in an application and discuss how the proposed alternative provides an acceptable method of complying with NRC regulations that underlie the DSRS acceptance criteria. Where the DCA contents differed from the guidance contained in the DSRS, the NRC staff reviewed the associated analytical techniques, data, and conclusions associated with the proposed alternative.

The NRC staff's acceptance criteria described in the DSRS and the SRP are based on meeting

the relevant requirements of the following NRC regulations:

Chapter 11:

- 10 CFR 20.1101(b), 10 CFR 20.1301, 10 CFR 20.1302, 10 CFR 20.1406;
- 10 CFR Part 20, Appendix B;
- 10 CFR 50.34, 10 CFR 50.36, 10 CFR 50.48, 10 CFR 50.34a, 10 CFR 50.65;
- 10 CFR Part 50, Appendix A, GDCs 2, 3, 19, 60, 61, 63, and 64;
- 10 CFR Part 50, Appendix I;
- 10 CFR 52.47(a)(5), 10 CFR 52.47(b)(1), 10 CFR 52.79(a)(3), and 10 CFR 52.79(a)(1), 10 CFR 52.17(a)(1), 10 CFR 52.63, 10 CFR 52.80;
- 10 CFR 61.55, 10 CFR 61.56; and
- 40 CFR Part 190.

The NRC staff must have sufficient information to ensure that the applicant has adequately addressed the regulatory requirements used as the basis for the NuScale Design Specific Review Standard Sections for 11.1, and other relevant guidance.

III. REGULATORY AUDIT SCOPE

The scope of this audit will be focused on the review of the technical information, including the associated calculations and basis documents, needed to review NuScale's Effluent Release (GALE Replacement) Methodology. The NRC staff requests the revised calculation packages be provided on the eRR and the associated revised Excel® Workbooks in native format be provided to support the review. As necessary, the NRC staff will schedule time with NuScale staff to review specific features of spreadsheets at the NuScale Rockville office. The identified documents and associated supporting electronic files with are listed below. Note that the listed documents are not necessarily in order of their review sequence and all need to be available during the audit.

- Crud Corrosion Product Radionuclide Source Term and Activity Calculation.pdf, and the associated Excel® Workbook(s) in native format;
- Water Activation.pdf, and the associated Excel® Workbook(s) in native format;
- NuScale Bounding Fuel Isotopic Inventory Calculations.pdf, and the associated Excel® Workbook(s) in native format;
- Realistic Rx Coolant and Secondary Coolant Activity Calculation.pdf, and the associated Excel® Workbook(s) in native format;
- BE PoolSourceTerm.xlsx, and the associated Excel® Workbook(s) in native format;

- Chemical and Volume Control System Normal Source Term.pdf, and the associated Excel® Workbook(s) in native format;
- CVCS Chemical Design Calculation.pdf, and the associated Excel® Workbook(s) in native format;
- Airborne Source Term Calculation.pdf, and the associated Excel® Workbook(s) in native format;
- Radioactive Waste Source Terms.pdf, and the associated Excel® Workbook(s) in native format;
- Release of Radioactive Materials in Gases and Liquid Effluents.pdf, and the associated Excel® Workbook(s) in native format;
- Gaseous Tank Failure;
- Liquid Tank Failure, and the associated Excel® Workbook(s) in native format; and
- Off Site Dose.

IV. AUDIT ACTIVITIES AND DELIVERABLES

The NRC audit team is expected to consist of individuals from the Radiation Protection and Accident Consequences Branch (RPAC); including Richard Clement, Stephen Williams, and Zachary Gran, and as needed the other identified members of the NRC staff. Additional NRC team members may be assigned to ensure adequate coverage of important technical elements. NuScale will be notified of any additional NRC team members at the time of identification.

The NRC staff acknowledges the proprietary and sensitive 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 copy or electronic files from the audit site(s).

A non-public entrance meeting will be conducted the first day of the audit, and a non-public exit meeting will be held approximately one month after the audit is completed to present audit results to NuScale representatives. Additional and periodic non-public audit status meetings will occur with the NRC staff and the applicant. These status meetings will be used to discuss the progress of the audit. An audit report will be prepared to document the results of the audit. This report will be made publicly available in ADAMS upon completion.

The audit will assist the NRC staff in understanding and verifying the current calculations for the GALE replacement methodology used by the NuScale design in determining the effluent releases. A successful review of NuScale's methodology will prepare the NRC staff for their review of the responses to eRAI 9161, eRAI 9253, and eRAI 9239 which is expected on August 31, 2018.

The agenda for the audit is presented in Attachment A of this audit plan. If necessary, any circumstances related to the conductance of the audit will be communicated to the NRC project manager. Getachew Tesfaye, at 301-415-8013 or Getachew.Tesfaye@nrc.gov, or Anthony Markley, at 301-415-3165 or Anthony.Markley@nrc.gov.

ATTACHMENT A

U.S. NUCLEAR REGULATORY COMMISSION REGULATORY
AUDIT PLAN FOR THE PHASE II REGULATORY AUDIT OF
THE GASEOUS AND LIQUID EFFLUENT REPLACEMENT METHODOLOGY
CONCERNING THE RADIOACTIVE WASTE MANAGEMENT SYSTEM OF
THE NUSCALE POWER, LLC DESIGN CONTROL
DOCUMENT DESIGN CERTIFICATION

DOCKET NO. 52-048

AUDIT PLAN AGENDA

May 14, 2018

Entrance Meeting

July 27, 2018

Exit Meeting to Discuss Audit Results