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

October 12, 2018

MEMORANDUM TO: Jennivine Rankin, Acting Chief
Licensing Branch 3
Division of Licensing, Siting, and Environmental Analysis
Office of New Reactors

FROM: Mallecia Sutton, Project Manager **/RA/**
Licensing Branch 3
Division of Licensing, Siting, and Environmental Analysis
Office of New Reactors

SUBJECT: AUDIT PLAN FOR THE SECOND REGULATORY AUDIT OF ENVIRONMENTAL REPORT FOR NUSCALE POWER, LLC REGARDING THE SEVERE ACCIDENT MITIGATION DESIGN ALTERNATIVE ANALYSIS

By letter dated December 31, 2016, NuScale Power, LLC (NuScale) submitted a Design Certification Application (DCA) and Environmental Report (ER) for its design review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The U.S. Nuclear Regulatory Commission (NRC) staff started its detailed technical review of NuScale's DCA on March 27, 2017. By letter dated March 15, 2018, NuScale submitted Revision 1 of the DCA for the NuScale design review (ADAMS Accession No. ML18086A090), including Revision 1 of the ER (ADAMS Accession No. ML18086A070).

The NRC staff has identified a need for a follow-up audit of NuScale's design and severe accident mitigation design alternatives (SAMDAs) as presented in Revision 1 of the ER. This is based on the results of the first audit (ADAMS Accession No. ML18143B667) and due to the changes incorporated in Revision 1 of the ER. The NRC staff determined that efficiency gains would be realized by auditing the documents supporting the information presented in the ER as well as other supporting documentation. The NRC staff also determined that an audit would be effective in identifying specific information needs to support the necessary regulatory findings required under Title 10 of the *Code of Federal Regulations* Part 51.

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301-415-0673

The audit will consist of two parts: (1) a review of NuScale documents that support the ER via an Electronic Reading Room available to the NRC staff from October 16, 2018, to November 16, 2018; and (2) audit meetings, as necessary, with the appropriate NuScale staff responsible for the SAMDAs analysis at the NuScale offices in Rockville, Maryland. The audit would remain open for 30 days until November 16, 2018; or a shorter duration should the staff satisfy its information needs.

Docket No.: 52-048

Enclosure: As stated

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

AUDIT PLAN FOR THE SECOND REGULATORY AUDIT OF THE ENVIRONMENTAL REPORT FOR NUSCALE POWER, LLC REGARDING THE SEVERE ACCIDENT MITIGATION DESIGN ALTERNATIVE ANALYSIS

DATED: October 12, 2018

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ADAMS Accession No.: ML18284A259 ***via email** NRO-002

OFFICE	PM:NRO/DLSE*	LA:NRO/DLSE*	BC:NRO/DLSE*	BC:NRO/DLSE
NAME	MSutton	SGreen	MDudek	JRankin (Acting)
DATE	10/11/2018	10/11/2018	10/12/2018	10/12/2018

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AUDIT PLAN FOR THE REGULATORY AUDIT OF THE ENVIRONMENTAL REPORT FOR NUSCALE POWER, LLC REGARDING THE SEVERE ACCIDENT MITIGATION DESIGN ALTERNATIVE ANALYSIS

A. Background

By letter dated December 31, 2016, NuScale Power, LLC (NuScale), submitted a Design Certification Application (DCA) and Environmental Report (ER) for its design review (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The U.S. Nuclear Regulatory Commission (NRC) staff started its detailed technical review of NuScale's DCA on March 27, 2017. By letter dated March 15, 2018, NuScale submitted Revision 1 of the DCA for the NuScale design review (ADAMS Accession No. ML18086A090), including Revision 1 of the ER (ADAMS Accession No. ML18086A070).

The NRC staff has identified a need for a follow-up audit of NuScale's design and severe accident mitigation design alternatives (SAMDAs) as presented in Revision 1 of the ER. This is based on the results of the first audit (ADAMS Accession No. ML18143B667) and due to the changes incorporated in Revision 1 of the ER. The NRC staff determined that efficiency gains would be realized by auditing the documents supporting the information presented in the ER as well as other supporting documentation. The NRC staff also determined that an audit would be effective in identifying specific information needs to support the necessary regulatory findings required under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51.

The purpose of the audit is to facilitate the NRC staff's review of information related to the environmental analyses evaluating the SAMDAs of the DCA, to support the staff in performing confirmatory analysis, and to complete its environmental assessment of the application in accordance with NRC regulations and guidance. The audit will assess the changes provided in ER Revision 1 along with open information needs from the first audit. The expected outcome of the audit is for the staff to obtain sufficient information with appropriate documentation from the applicant to support the staff in reaching a regulatory environmental finding. The NRC staff is planning an audit that includes:

- A regulatory audit will be conducted via the NuScale Electronic Reading Room (eRR), in addition to direct discussions with subject matter experts that would be carried out at the NuScale office in Rockville, Maryland, as appropriate. The audit will commence on October 16, 2018, via teleconference.

- During this audit, the NRC staff will examine Revision 1 of the ER, necessary calculation packages, and supporting documents related to areas important to the NuScale environmental review.

This environmental audit is being coordinated with the DCD Chapter 19, "Probabilistic Risk Assessment," safety review. As such, some of the documents benefit both areas because they contain information from the Level 1 and Level 2 probable risk assessment (PRA) being applied as part of the environmental analysis used to support the SAMDA determination that

may not have been part of the DCD Chapter 19 review. The staff also expects the applicant will revise the ER to incorporate the information, references, and additional analyses which will be identified from the audit as necessary to aid the staff in complying with Section 102(2) of the National Environmental Policy Act 10 CFR 51.41.

B. Regulatory Audit Bases

The NRC staff's acceptance criteria are based on meeting the relevant requirements of the following NRC regulations:

- 10 CFR 52.47(b)(2), "Contents of applications: technical information"
- 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions"
- 10 CFR 51.30, "Environmental assessment"
- 10 CFR 51.41, "Requirement to submit environmental information"
- 10 CFR 51.45, "Environmental report"
- 10 CFR 51.55, "Environmental report—standard design certification"

C. Regulatory Audit Scope or Methodology

Audit Scope:

- The area of focus for the audit is NuScale's ER Revision 1 (Part 3 of the DCA) along with NuScale-provided supporting calculations and documentation.

Methodology and NRC Guidance:

- NUREG-1555, "Environmental Standard Review Plan—Standard Review Plans for Environmental Reviews for Nuclear Power Plants," Sections 7.2 and 7.3, Main Report and 2007 Revisions, available at http://www.nrc.gov/readingrm/doc-collections/nuregs/staff/sr1555/toc/.
- NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4, 2004, ADAMS Accession No. ML042820192.
- NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," 1997, ADAMS Accession No. ML050190193.

D. Information and Other Background Material for the Regulatory Audit

Documents available on the docket:

- NuScale Power, LLC, Standard Design Certification Application, Part 3, Revision 1, March 2018, ADAMS Accession No. ML18086A070.

- NuScale Power, LLC, “A Risk Significance Determination,” TR-0515-13952-NP, Revision 0, ADAMS Accession No. ML16284A016.

Documents subject or topics to be made available to the NRC staff for review and discussion during the audit:

- SAMDA identification and screening process for the reactor building crane and associated Release Category 8

- Cost evaluation files for Release Category 8 SAMDAs

- MACCS input and output decks

- Cost-benefit calculation files for sensitivity study cases

- Seismic event data and sources

- Reactor building crane failure analysis

Other documents:

- Information Needs (see Attachment 1)

E. Audit Team

The following are the NRC audit team members:

Mallecia Sutton, NRC Project Manager, NRO/DLSE/LB3
Donald Palmrose, NRC Technical Reviewer, NRO/DLSE/RPAC
Jason Schaperow, NRC Technical Reviewer, NRO/DSRA/SPRA
Marie Pohida, NRC Technical Reviewer, NRO/DSRA/SPRA
Hanh Phan, NRC Technical Reviewer, NRO/DSRA/SPRA
Alfred Hathaway, NRC Technical Reviewer, RES/DSA/AAB
Keith Compton, NRC Technical Reviewer, RES/DSA/AAB

F. Logistics

The audit will consist of two parts: (1) a review of NuScale documents that support the ER via an eRR available to the NRC staff from October 16, 2018 to November 16, 2018; and (2) audit meetings, as necessary, with the appropriate NuScale staff responsible for the SAMDAs analysis at the NuScale offices in Rockville, Maryland. The audit would remain open for 30 days until November 16, 2018.

The proposed audit schedule is as follows:

Date: Tuesday, October 16, 2018, (via Teleconference)

10:00 a.m.	Audit Meeting Opens
8:45 a.m.	Introductions and Safety Briefing
9:00 a.m.	Audit Begins

Location:	NuScale Power, LLC Rockville Office 11333 Woodglen Avenue, Suite 205 Rockville, Maryland 20852

Date: Tuesday, November 6, 2018 (Tentative)

8:30 a.m.	Audit Meeting
12:00 p.m.	Lunch
1:00 p.m.	Team Continues Audit
4:30 p.m.	Team Debrief
5:00 p.m.	Audit Meeting Adjourns

Date: Wednesday, November 7, 2018, [OPTIONAL]

8:30 a.m.	Audit Meeting Resumes
12:00 p.m.	Lunch
1:00 p.m.	Team Continues Audit
4:30 p.m.	Team Debrief
5:00 p.m.	Audit Meeting Adjourns

G. Deliverables

The audit team plans to issue an audit report within 90 days after completing the audit that will address the technical areas identified in the information needs table along with presenting the audit outcomes.

The NRC staff acknowledges the proprietary nature of portions of the information requested. This material, when identified by NuScale, will be handled appropriately throughout the audit. While the NRC staff will take notes during the audit, the NRC staff will not remove hard copies or electronic files from NuScale's Rockville Office.

At the completion of the audit, the NRC staff will prepare an audit report that will be declared and entered as an official agency record in ADAMS. The audit outcome may be used to identify any additional information to be submitted for making environmental findings, and will assist the NRC staff in the issuance of requests for additional information (RAIs) (if necessary) in completing its review of Part 3 of the NuScale DCA.

H. References

1. U.S. Nuclear Regulatory Commission. 2000. *Environmental Standard Review* Plan—Standard *Review Plans for Environmental Reviews for Nuclear Power Plants*. NUREG–1555,Main Report and 2007 Revisions, Washington, D.C. available at http://www.nrc.gov/readingrm/doc-collections/nuregs/staff/sr1555/toc/.

2. NuScale Power LLC, NuScale Standard Plant Design Certification Application, Part 3, "Applicant's Environmental Report – Standard Design Certification," Revision 1, March 2018. ADAMS Accession No. ML18086A070

3. U.S. Nuclear Regulatory Commission. Memorandum to Jennivine Rankin from Mallecia A. Sutton. Subject: Summary Report for the Environmental Audit of Part 3 of the NuScale Design Certification Application. June 13, 2018. ADAMS Accession No. ML18143B667

Attachment 1: NuScale Environmental Report Informational Needs

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
ER-A	---	---	Provide access to the NRC staff on the NuScale eRR for the NuScale documents as they relate to the following topic areas in support of Revision 1 of the ER (ER Rev. 1): • Reactor building crane failures and improving reliability of same • Evaluation of the costs of enhancements associated with improving the reactor building crane • MACCS source term documentation for Release Category 8 • Calculation file(s) for the information provided in Tables B-5 and B-6 • Calculation file(s) for the information provided in Table B-26 • Offsite consequence calculation file(s) for each release category regarding the Peach Bottom site similar to the information provided in Table B-27 for the Surry site • Surry and Peach Bottom seismic information and determination of related seismic code damage frequencies • Other documents that relate to the changes applied in ER Revision 1 Potential documents to provide, but not limited to, for access in the eRR include: • ER-P030-3751_R1_SAMDA Value Max Risk Calc.pdf • ER-P050-3815_R1_PRA for Reactor Building Crane.pdf • ER-P060-7085_R1_Dropped Module Conseq_Analysis.pdf • ER_P030_3753_01_SAMDA_Identification_and Screening.pdf • ER_P030_4113_R0_MELCOR_Accident_Consequence_Code_System_MACCS_Base_Model.pdf • ER_P040_4281_R0_Seismic_Core_Damage_Freq_Eval_for_Peach_Bottom_Surry_Sites.pdf • ER_P040_7026_R0_Seismic_Margin_Assessment_Notebook.pdf • TR-0515-13952-NP-A Risk Significant Determination Approved Version.pdf

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			While these documents may have been reviewed in the first audit, the staff needs to assess the source documents that were the basis for the changes in ER Revision 1. [Related to ER-01 from the first environmental audit]
ER-B	---	---	Provide access to the NuScale WinMACCS input and output files in native format for the Surry site base case and all sensitivity cases. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection III, "Review Procedures," item (3) has the staff determine if the method (computer code) used to evaluate the environmental consequences is appropriate and that it evaluates consequences to a distance of 80 km (50 mi). Additionally, items (4) through (10) has the staff determine if various inputs applied in the consequence assessment methodology are appropriate. [Related to ER-02 from the first environmental audit]
ER-C	--	--	Provide knowledgeable experts to discuss NuScale's Final Safety Analysis Report (FSAR) Section 19.2.6, "Consideration of Potential Design Improvements Under 10 CFR 50.34(f)." For example, the discussion would include Combined License (COL) Items 19.2-2 (FSAR Chapter 19 page 19.2-36) and COL Items 19.2-3 (FSAR Chapter 19 page 19.2-39) and their significance to SAMDA 85 and the 35 SAMDAs associated with "Training/procedural changes are not required for design certification." The staff needs to understand NuScale's rationale for including the COL items as part of the DCA Chapter 19 review while not discussing them with respect to related SAMDAs in the ER.

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			NuScale FSAR Chapter 19 (ADAMS Accession No. ML18086A192) discusses SAMDAs in Section 19.2.6. As part of this discussion, two COL items are provided regarding COL applicants using a site-specific PRA and assessing other components of SAMAs that could be assess at the COL stage (e.g., procedural enhancements, surveillance action enhancements, training, other design elements not previously considered, etc.). However, there is not a discussion in the ER for each of the two COL items. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," states under "Review Interfaces" to coordinate with the responsible [DCD, Tier 2, Chapter 19] reviewer for the design certification to ensure consistency with the severe-accident analyses given by the applicant in the ER.
ER-D	---	---	Provide knowledgeable experts for clarification on the following information given in the ER: • Page 5: "… the system level event always fails to operate." • Page 41: The meaning of "X" in "ECCS RVV trip valve X" • Pages B-46 and B-47: The rationale for the statement "Therefore, the base case is acceptable," • Page B-47: The basis for the statement "This seismic CDF analysis used a preliminary NuScale PRA model, however in the context of the ***results*** of this report the use of the preliminary PRA model compared to the final PRA model to establish seismic CDF produces ***a more conservative result*** and should not significantly affect the identification of SAMDAs." For example, the basis for saying the preliminary PRA model produces a more conservative result along with what "result" is being referred to. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection III, "Review Procedures," item (2) has the staff determine if the information given in the ER on which the applicant's analysis is based is appropriate (release sequences, core damage frequencies, and source terms).

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
ER-E	4.0	5	Provide knowledgeable experts to discuss how key insights from the Level 1 PRA and Level 2 PRA evaluations provided in FSAR Tables 19.1-23 and 19.1-32 were applied in the NuScale SAMDA assessment. Section 4.0 is the only place in the ER where FSAR Tables 19.1-23 and 19.1-32 are mentioned and there is no indication on how the information informed the SAMDA assessment. Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection III, "Review Procedures," item (2)(b) has the staff verify that the applicant's list of potential SAMAs includes a reasonable range of applicable SAMAs derived from consideration of previous analyses and based on insights from the Level 1 and Level 2 portions of the applicant's PRA or IPE/IPEEE.
ER-F	4.1.11 Appendix A	23 A-26	Provide knowledgeable experts to discuss the process for creating the NuScale specific SAMDAs for the reactor building crane failure along with the expected cost to be greater than $450,000. Due to the nature of the failures as discussed in Section 4.1.11, Reactor Building Crane Failures, the staff needs to understand the development process, assumptions, and assessments conducted by NuScale in identifying the specific Reactor Building Crane SAMDAs for consideration as potentially cost-beneficial. Specifically, the staff needs to understand what was considered to improve reliability for SAMDA 200 and redundancy for SAMDA 201 along with the process for determining the appropriate cost to implement each SAMDA. Additionally, the staff needs to understand how information from the safety analysis was or was not factored into the SAMDA assessment. For example, during the NuScale DCA safety review, the staff discussed that Table 17.4-1, Design Reliability Assurance Program Structure, System, and Component Functions, Categorization, and Categorization, does not include instrumentation for the Reactor Building Crane (see meeting summary provided in ADAMS Accession No. ML18204A124). The staff also requested additional information regarding module drop event failures in eRAI 9128. NuScale provided responses in two submittals in regards to this eRAI: the original response dated February 5, 2018, under ADAMS Accession No. ML18036B203 and a supplemental response dated June 14, 2018, under ADAMS Accession No. ML18165A431.

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection II, "Acceptance Criteria," has the following acceptance criteria: Completeness and reasonableness, also with respect to the following: (1) the identification of SAMAs applicable to the plant or design under consideration, (2) the estimation of core damage frequency (CDF) reduction and averted person-rem for each SAMA, (3) the estimation of cost for each SAMA, (4) the ranking of value-impact screening criteria to identify SAMAs for further consideration, and (5) the final disposition of promising SAMAs. Additionally, under Subsection III, "Review Procedures," items (4) and (5) has the staff assessing whether the applicant's cost estimates for the SAMDAs and the benefit-cost comparison are reasonable.
ER-G	4.1.11, Appendix B	23, B-9, B-10, B-48	Provide knowledgeable experts to discuss references for: • Reactor building crane description and related failures discussed in Section 4.1.11 (e.g., no citation to FSAR Section 9.1.5) • Sensitivity results presented in Table 5-5 • Core inventories applied for the Base Case and Sensitivity Case No. 5 as provided in Tables B-5 and B-6 (e.g., no citation to FSAR Table 11.1-1 or other source material) • Tables B-7 up to and including Table B-26 • The changes to Section B.2 in Appendix B of ER Revision 1 include new tables or changes to the prior tables in ER Revision 0. Many of these tables do not reference the sources for the provided information. • The seismic CDFs for the Surry and Peach Bottom sites provided in Table B-30 The above identified items do not have citations to the source documents to permit a reviewer to independently evaluate the appropriateness of using the information for assessing the specific environmental impacts.

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			The degree of detail provided by the applicant in their Environmental Report should satisfy Regulatory Guide 4.2, Revision 2, "Preparation of Environmental Reports for Nuclear Power Stations," Section A.7.c, "Presentation of Information," (see Regulatory Guide 4.2, Revision 2, page x under ADAMS Accession No. ML003739519). [Related to ER-07 from the first environmental audit]
ER-H	5.2, 5.3	27 and 28	Provide knowledge experts to discuss the rationale for the values presented in Tables 5-1 and 5-2 changing in ER Revision 1 when compared to ER Revision 0. Tables 5-1 and 5-2 values in ER Revision 1 for Release Categories 1 through 7 generally had a decrease in their per event values while Release Category 8 had a slight increase for off-site dose and off-site economic impact. While the change in values does not affect the overall results previous presented in ER Revision 0 (off-site consequences only account for less than 0.1 percent of the maximum benefit), the staff needs to understand the basis for the changes as being appropriate for the off-site assessment. For example, code version differences could result in slight changes in results. In the case of NuScale's DCA, ER Revision 0 applied MACCS Version 3.10.0 and MELCOR Version 1.8.6 while ER Revision 1 applied MACCS Version 3.10.1.2 and MELCOR Version 2.2.9541. However, there were only two radionuclide inventory changes in the best estimate core inventory, which was input for the base case assessment (Note: ER Rev. 1 also provides in Table B-6 as new information a high burnup core inventory that is applied in Sensitivity Case 5).

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection III, "Review Procedures," item (3) has the staff determine if the method (computer code) used to evaluate the environmental consequences is appropriate and that it evaluates consequences to a distance of 80 km (50 mi). Additionally, items (4) through (10) has the staff determine if various inputs applied in the consequence assessment methodology are appropriate. [Related to ER-14 from the first environmental audit]
ER-I	5.2, 5.3, B.2.9	27 and 28; B-41 and B-42	Provide knowledgeable experts to discuss the process for determining the release frequency associated with the dropped national meter programming during transport release category. In reference to RAI 9128, Question 19-37, the staff has identified the need to reconcile the NuScale module drop probability and previous heavy load drop probabilities developed in EPRI Report 1009691 and NUREG-1774 (see meeting summary provided in ADAMS Accession No. ML18204A124). Of note, NuScale's failure probability per lift is one order of magnitude lower than estimated in EPRI Report 1009691, and two orders of magnitude lower than estimated in NUREG-1774. Additionally, it is the staff's understanding based on the FSAR Chapter 19 review that module drop events are driven by human error. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," states the following: 1) Under Review Interfaces, coordinate with the responsible [DCD, Tier2, Chapter 19] reviewer for the design certification to ensure consistency with the severe-accident analyses given by the applicant in the ER; and 2) Under Data and Information Needs, information should be obtained on the release sequences (accident classes) for severe accidents with their associated core damage frequencies and source terms (from the ER and the design certification PRA submittal).

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
ER-J	5.8	37 and 38	Provide knowledgeable experts to discuss the analytical results for the offsite consequences and for each averted cost components for the Peach Bottom sensitivity case. Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection III, "Review Procedures," in items (4) and (5) has the staff assessing whether the applicant's cost estimates for the SAMDAs and the benefit-cost comparison are reasonable. [Related to ER-17 from the first environmental audit]
ER-K	5.8	36-38	Provide knowledgeable experts to discuss the WinMACCS calculations for the sensitivity cases discussed in ER Section 5.8, Maximum Benefit Sensitivity Study. Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection III, "Review Procedures," in items (4) and (5) has the staff assessing whether the applicant's cost estimates for the SAMDAs and the benefit-cost comparison are reasonable. Additional guidance is provided in NEI 05-01A, Section 8 for sensitivity analysis (see NuScale reference 8.1-1). [Related to ER-17 and ER-18 from the first environmental audit]
ER-L	5.8	36-38	Provide knowledgeable experts to discuss the assumptions and sources of information for the WinMACCS input parameter values ascertained for the Surry and Peach Bottom sites. The staff has developed specific Surry site and Peach Bottom site MACCS input decks based on the information and references provided in the ER Revision 1. However, there are several MACCS input parameters that the staff cannot assign a value based on ER Revision 1 information or the staff needs access to the information applied in MACCS calculations for certain sensitivity cases (e.g., high burnup core inventory). Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This includes estimating the environmental consequences of

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			severe accidents using an acceptable methodology such as MACCS/WinMACCS. Not all of the WinMACCS input parameter values can be determined based on the information currently provided in ER Revision 1. [Related to ER-18 and ER-19 from the first environmental audit]
ER-M	6.2 and 6.3	53-54	Provide knowledgeable experts to discuss the evaluation of potentially cost-beneficial SAMDAs based on a comparison to the Maximum Benefit sensitivity calculations specifically involving SAMDAs 200, 201, and 202. The maximum benefit value and the sensitivity cases were revised in ER Revision 1. The staff needs to understand the assumptions and their bases applied in the sensitivity cases, especially for Sensitivity Cases 3, Peach Bottom along with their assessment to the averted cost. Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection III, "Review Procedures," in items (4) and (5) has the staff assessing whether the applicant's cost estimates for the SAMDAs and the benefit-cost comparison are reasonable. [Related to ER-20 from the first environmental audit]
ER-N	Appendix A	A-12	Provide knowledgeable experts to discuss SAMDA 17 and SAMDA 85 bases in regards to a single unit site while "technically a multiunit site" and their assessment by a COL applicant for "a site that contains multiple plants." The maximum benefit analysis provided in Section 5.7 of ER Revision 1 is based on a site-wide seismic event involving all 12 NPMs. The staff needs clarification on how NuScale defines "a single unit site" versus multiple plants or multiunit site.

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			Environmental Standard Review Plan, NUREG-1555, Section 7.3 under Subsection III, "Review Procedures," in items (4) and (5) has the staff assessing whether the applicant's cost estimates for the SAMDAs and the benefit-cost comparison are reasonable. [Related to ER-21 from the first environmental audit]
ER-O	Appendix B	B-1	Provide knowledgeable experts to discuss the implementation of the off-site economic models. Appendix B of the ER Revision 1 states the SOARCA models used for the basis of the analysis did not intend to evaluate the off-site economic consequences. The staff needs clarification on the development of the parameters required to implement the offsite economic model (e.g., parameters defining the ingestion pathway). Environmental Standard Review Plan, NUREG-1555, Section 7.2, under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This includes estimating the environmental consequences of severe accidents using an acceptable methodology such as MACCS/WinMACCS. Not all of the WinMACCS input parameter values can be determined based on the information currently provided in ER Revision 1.
ER-P	Appendix B	B-1	Provide knowledgeable experts to discuss modification and implementation of the Dose Conversions. The dose conversion file Fgr13dcf.inp was referenced in Appendix B of the ER Revision 1 and the dose conversion factors of this file were updated to modify the chronic inhalation dose factors for nuclides identified in the SOARCA Peach Bottom Uncertainty analysis. The staff needs clarification on how NuScale implemented these modifications and if the implementation included consideration to the other parameters which may be influenced by these changes such as the Cancer Fatality Risk Coefficients.

Serial No.	Environmental Report Section(s)	Page Number(s)	Information Needs
			Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This includes estimating the environmental consequences of severe accidents using an acceptable methodology such as MACCS/WinMACCS. Not all of the WinMACCS input parameter values can be determined based on the information currently provided in ER Revision 1. [Related to ER-22 from the first environmental audit]
ER-Q	Appendix B	B-8	Provide knowledgeable experts to discuss the implementation of the off-site economic models. Appendix B of the ER Revision 1 states "Relocation occurs in both the emergency phase and the long-term action phase, modeled as having a five-year duration." The staff needs clarification on the intended meaning of long-term action phase, i.e. is this the length of the long-term phase or the dose projection period during the long-term phase. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection III, "Review Procedures," in item (10) has the staff evaluate the protective actions considered by the applicant in its consequence assessment and determine were protective actions properly considered. [Related to ER-22 from the first environmental audit]
ER-R	Appendix B	B-12/B-17/ B-24/B-31/ B-35	Provide knowledgeable experts to discuss the modeling assumptions related to the particle size distributions used for Release Categories 1, 2, 3, 4, 6, and 7. Release Categories 1, 2, 4, 6, and 7 indicate the particle size distribution generated for Release Category 3 also applies to them. The staff needs clarification on how the particle size distribution for Release Category 3 was created and the rationale as to why it is a suitable surrogate when MELCOR should be able to generate the individual calculated particle size distributions for each

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			release category. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," states as part of the data and information needs for the staff to obtain a list of release sequences (accident classes) for severe accidents with their associated core damage frequencies and source terms. The source term information must include the particle size distribution for each release category from the MELCOR analysis. The support program MelMACCS can easily extract from MELCOR the individual calculated particle size distributions for each release category for direct use in MACCS calculations. [Related to ER-22 from the first environmental audit]
ER-S	Appendix B	B-39	Provide knowledgeable experts to discuss the creation of the Release Category 8 source terms and its implementation in MACCS. Release Category 8 of the ER Revision 1 is a release of noble gases and two forms of Iodine (elemental and organic). The staff needs clarification on how this source term was implemented in the MACCS code, including any potential modifications to MACCS control files, dose conversion files, or ingestion models to create the model and technical justification for those modifications. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This includes estimating the environmental consequences of severe accidents using an acceptable methodology such as MACCS/WinMACCS. Not all of the WinMACCS input parameter values can be determined based on the information currently provided in ER Revision 1. [Related to ER-22 from the first environmental audit]

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ER-T	Appendix B	B-43	Provide knowledgeable experts to discuss the modeling assumptions for Sensitivity Case 3 which utilizes the SOARCA Peach Bottom study as a basis. Sensitivity case 3 uses the Peach Bottom site as a basis to consider the impact of the site on the results. The staff needs clarification on how this model was implemented, i.e. if the SOARCA Peach Bottom model served as the initial basis for the sensitivity; were deviations between the sites other than population distributions and economic parameters considered, such as differences in the hotspot and normal relocation times or long-term habitability criteria between the two sites. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This includes estimating the environmental consequences of severe accidents using an acceptable methodology such as MACCS/WinMACCS. Not all of the WinMACCS input parameter values can be determined based on the information currently provided in ER Revision 1. [Related to ER-19 from the first environmental audit]
ER-U	Appendix B	B-48	Provide knowledgeable experts to discuss the seismic CDF information provided in Table B-30 for both the Surry and Peach Bottom sites. Tables ES-1 and ES-2 of the SOARCA study in NUREG-1935 give seismic CDFs for Peach Bottom and Surry of 3×10^{-6}/year and 2×10^{-5}/year, respectively. The seismic CDF given in Table B-30 is a factor of 1000 lower than that in the SOARCA study. Environmental Standard Review Plan, NUREG-1555, Section 7.2 under Subsection I, "Areas of Review," and Subsection III, "Review Procedures," the data and information needs along with guidance for conducting the review. This may include estimating the environmental consequences of severe accidents by applying core damage frequencies of externally-initiated events. Additionally, the degree of detail provided by the applicant in their Environmental Report should

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			satisfy Regulatory Guide 4.2, Revision 2, “Preparation of Environmental Reports for Nuclear Power Stations,” Section A.7.c, “Presentation of Information,” (see Regulatory Guide 4.2, Revision 2, page x under ADAMS Accession No. ML003739519). [Related to ER-01 and ER-15 from the first environmental audit]