



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

September 29, 2023

Ms. Carrie Fosaaen
Vice President, Regulatory Affairs
NuScale Power, LLC
1100 NE Circle Boulevard, Suite 200
Corvallis, OR 97330

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

Dear Ms. Fosaaen:

This letter provides the current status of the regulatory audit being conducted by the NRC staff as part of its safety review of the NuScale Standard Design Approval Application (SDAA) submitted stages, the last submittal of which was provided on December 31, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML22339A066 and ML23131A300) and supplemented by letters dated July 14, 2023 (ML23195A092) and July 17, 2023 (ML23198A244). The staff began conducting the audit on March 27, 2023 (ML23067A300). The audit is intended to achieve efficiencies in the safety review by allowing the staff to review and discuss supporting material with the objective of improving communication and understanding of complex technical topics.

To date, the staff has presented 641 document requests and items for explanation in the audit. Of these, 332 items have been resolved in the audit, 201 items provided by NuScale are under review by the staff and 108 items are waiting for NuScale to provide responses in the audit. The staff has communicated to NuScale that the following items related to the final safety analysis report (FSAR) and the loss of coolant accident (LOCA) licensing topical report (LTR) resolved in the audit need to be submitted on the docket:

Chapter 3

1. 3.4.2-2 - information related to FSAR Section 3.4.2, "Flood Protection from External Sources,"
2. 3.7.2-1 - information related to FSAR Section 3.7.2, "Seismic System Analysis,"
3. 3.7.2-6 - information related to FSAR Section 3.7.2, "Seismic System Analysis,"
4. 3.8.2-1 - information related to FSAR Section 3.8.2, "Steel Containment,"
5. 3.8.2-2 - information related to FSAR Section 3.8.2, "Steel Containment,"
6. 3.9.1-2 - information related to FSAR Section 3.9.1, "Special Topics for Mechanical Components,"
7. 3.9.2-2 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
8. 3.9.2-3 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"

9. 3.9.2-4 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
10. 3.9.2-6 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
11. 3.9.2-8 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
12. 3.9.2-9 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
13. 3.9.2-10 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
14. 3.9.2-11 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
15. 3.9.2-12 - information related to FSAR Section 3.9.2, "Dynamic Testing and Analysis of Systems, Components, and Equipment,"
16. 3.9.4-1 - information related to FSAR Section 3.9.4, "Control Rod Drive System,"
17. 3.9.4-4 - information related to FSAR Section 3.9.4, "Control Rod Drive System,"
18. 3.9.4-5 - information related to FSAR Section 3.9.4, "Control Rod Drive System,"
19. 3.9.6-1 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
20. 3.9.6-5 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
21. 3.9.6-9 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
22. 3.9.6-12 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
23. 3.9.6-13 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
24. 3.9.6-14 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
25. 3.9.6-16 - information related to FSAR Section 3.9.6, "Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,"
26. 3.12-3 - information related to FSAR Section 3.12, "ASME Code Class 1, 2, and 3 Piping Systems, Piping Components and Associated Supports,"

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27. 3.12-4 - information related to FSAR Section 3.12, "ASME Code Class 1, 2, and 3 Piping Systems, Piping Components and Associated Supports,"

28. 3.12-6 - information related to FSAR Section 3.12, "ASME Code Class 1, 2, and 3 Piping Systems, Piping Components and Associated Supports,"

29. 3.12-9 - information related to FSAR Section 3.12, "ASME Code Class 1, 2, and 3 Piping Systems, Piping Components and Associated Supports,"

Chapter 4

30. 4.2-2 - information related to FSAR Section 4.2, "Fuel System Design,"

31. 4.3-8 - information related to FSAR Section 4.3, "Nuclear Design,"

32. 4.6-1 - information related to FSAR Section 4.6, "Functional Design of Control Rod Drive System,"

Chapter 5

33. 5.2.1.1-4 - information related to FSAR Section 5.2.1.1, "Compliance with 10 CFR 50.55a,"

34. 5.2.1.1-5 - information related to FSAR Section 5.2.1.1, "Compliance with 10 CFR 50.55a,"

35. 5.2.1.2-3 - information related to FSAR Section 5.2.1.2, "Compliance with Applicable Code Cases,"

Chapter 7

36. 7.1-1 - information related to FSAR Section 7.1, "Fundamental Design Principles,"

Chapter 9

37. 9.2.9-2 - information related to FSAR Section 9.2.9, "Utility Water Systems,"

38. 9.3.4-1 - information related to FSAR Section 9.3.4, "Chemical and Volume Control System,"

Chapter 10

39. 10.2-1 - information related to FSAR Section 10.2, "Turbine Generator,"

40. 10.3-2 - information related to FSAR Section 10.3, "Main Steam System,"

41. 10.3-3 - information related to FSAR Section 10.3, "Main Steam System,"

42. 10.3.6-1 - information related to FSAR Section 10.3.6, "Steam and Feedwater System Materials,"

43. 10.4-1 - information related to FSAR Section 10.4, "Other Features of Steam and Power Conversion System,"

44. 10.4.5-6 - information related to FSAR Section 10.4.5, "Condensate Polisher Skid and Resin Regeneration System,"

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Chapter 11

- 45. 11.1-2 - information related to FSAR Section 11.1, "Source Terms,"
- 46. 11.1-3 - information related to FSAR Section 11.1, "Source Terms,"
- 47. 11.3-2 - information related to FSAR Section 11.3, "Gaseous Waste Management System,"
- 48. 11.4-1 - information related to FSAR Section 11.4, "Solid Waste Management System,"
- 49. 11.4-2 - information related to FSAR Section 11.4, "Solid Waste Management System,"
- 50. 11.4-3 - information related to FSAR Section 11.4, "Solid Waste Management System,"
- 51. 11.4-4 - information related to FSAR Section 11.4, "Solid Waste Management System,"
- 52. 11.4-5 - information related to FSAR Section 11.4, "Solid Waste Management System,"
- 53. 11.5-1 - information related to FSAR Section 11.5, "Process and Effluent Radiation Monitoring Instrumentation and Sampling System,"
- 54. 11.5-2 - information related to FSAR Section 11.5, "Process and Effluent Radiation Monitoring Instrumentation and Sampling System,"
- 55. 11.5-3 - information related to FSAR Section 11.5, "Process and Effluent Radiation Monitoring Instrumentation and Sampling System,"
- 56. 11.5-4 - information related to FSAR Section 11.5, "Process and Effluent Radiation Monitoring Instrumentation and Sampling System,"

Chapter 12

- 57. 12.2.1.8-1 - information related to FSAR Section 12.2.1.8, "Reactor Pool Water,"
- 58. 12.2-1 - information related to FSAR Section 12.2, "Radiation Sources,"
- 59. 12.2-3 - information related to FSAR Section 12.2, "Radiation Sources,"
- 60. 12.2-5 - information related to FSAR Section 12.2, "Radiation Sources,"
- 61. 12.3.1.1-2 - information related to FSAR Section 12.3.1.1, "Equipment Design,"
- 62. 12.3.2.2-1 - information related to FSAR Section 12.3.2.2, "Design Considerations,"
- 63. 12.4.1.9-1 - information related to FSAR Section 12.4.1.9, "Construction Activities,"

Chapter 15

- 64. 15.5.1-1 - information related to FSAR Section 15.5.1, "Chemical and Volume Control System Malfunction,"

65. 15.6.3-1 - information related to FSAR Section 15.6.3, "Steam Generator Tube Failure (Thermal Hydraulic),"

Chapter 16

66. 16-1 - information related to FSAR Chapter 16, "Technical Specifications,"

67. 16.1.1-1 - information related to FSAR Section 16.1.1, "Introduction to Technical Specifications,"

68. 16.5.5.09-1 - information related to Generic Technical Specification 5.5.9, "Containment Leakage Rate Testing Program,"

69. 16.5.5.09-2 - information related to Generic Technical Specification 5.5.9, "Containment Leakage Rate Testing Program,"

70. 16.5.5.09-3 - information related to Generic Technical Specification 5.5.9, "Containment Leakage Rate Testing Program,"

Chapter 17

71. 17.4-1 - information related to FSAR Section 17.4, "Reliability Assurance Program,"

Chapter 18

72. 18-1 - information related to FSAR Chapter 18, "Human Factors Engineering,"

73. 18.2-1 - information related to FSAR Section 18.2, "Operating Experience Review,"

74. 18.3-2 - information related to FSAR Section 18.3, "Functional Requirements Analysis and Function Allocation,"

75. 18.3-3 - information related to FSAR Section 18.3, "Functional Requirements Analysis and Function Allocation,"

76. 18.4-2 - information related to FSAR Section 18.4, "Task Analysis,"

77. 18.5-1 - information related to FSAR Section 18.5, "Staffing and Qualifications,"

78. 18.6-2 - information related to FSAR Section 18.6, "Treatment of Important Human Actions,"

79. 18.7-4 - information related to FSAR Section 18.7, "Human-System Interface Design,"

80. 18.7-5 - information related to FSAR Section 18.7, "Human-System Interface Design,"

81. 18.7-6 - information related to FSAR Section 18.7, "Human-System Interface Design,"

82. 18.10-1 - information related to FSAR Section 18.10, "Human Factors Verification and Validation,"

83. 18.10-2 - information related to FSAR Section 18.10, "Human Factors Verification and Validation,"

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Chapter 19

- 84. 19.1-20 - information related to FSAR Section 19.1, "Probabilistic Risk Assessment,"
- 85. 19.1-25 - information related to FSAR Section 19.1, "Probabilistic Risk Assessment,"
- 86. 19.1-27 - information related to FSAR Section 19.1, "Probabilistic Risk Assessment,"
- 87. 19.1-40 - information related to FSAR Section 19.1, "Probabilistic Risk Assessment,"
- 88. 19.3-1 - information related to FSAR Section 19.3, "Regulatory Treatment of Nonsafety Systems,"
- 89. 19.5-12 - information related to FSAR Section 19.5, "Adequacy of Design Features and Functional Capabilities Identified and Described for Withstanding Aircraft Impacts,"

Rod Ejection Accident Methodology LTR

- 90. RE-02 – information related to Rod Ejection Accident Methodology LTR, TR-0716-50350, Revision 2 (ML21351A399). This information is discussed in a separate limited scope audit that began on April 19, 2023 (ML23107A227).

The information requested under each identifying number will be described in detail when NuScale submits the information for docketing as discussed in the audit.

If you have any questions, I can be reached at (301) 415-8013 or by email at Getachew.Tesfaye@nrc.gov.

Sincerely,

/RA/

Getachew Tesfaye, Senior Project Manager
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

Docket No: 05200050

cc: DC NuScale Power LLC Listserv

SUBJECT: AUDIT STATUS - THE STAFF REVIEW OF THE NUSCALE POWER, LLC STANDARD DESIGN APPROVAL APPLICATION – NUSCALE US460.
 DATED: September 29, 2023

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