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

November 9, 2018

MEMORANDUM TO: Samuel S. Lee, Chief
Licensing Branch 1
Division of Licensing, Siting
and Environmental Analysis
Office of New Reactors

FROM: Omid Tabatabai, Senior Project Manager */RA/*
Licensing Branch 1
Division of Licensing, Siting
and Environmental Analysis
Office of New Reactors

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION STAFF INTERIM AUDIT REPORT FOR CONTAINMENT AND VENTILATION SYSTEMS (DOCKET NO. 52-048)

In March 2017, the U.S. Nuclear Regulatory Commission (NRC) staff began a regulatory audit of certain documents of the NuScale Power, LLC (NuScale) design certification application (DCA) pertaining to the Containment and Ventilation Systems. The NRC staff issued its initial audit plan on March 29, 2017, and an addenda to the audit plan on June 28, 2018 (Agencywide Documents Access and Management System Accession Nos. ML17087A077 and ML18177A087). The intent of this audit, in part, was to gain a more detailed understanding of the NuScale design in technical areas associated with containment and ventilation systems and to identify information that will require docketing to support the basis of the regulatory decision.

This interim audit summary report documents the NRC staff's audit activities and progress from April 3, 2017 through August 31, 2018. The NRC staff conducted the audit in accordance with the Office of New Reactors (NRO) Office Instruction NRO-REG-108, "Regulatory Audits."

Docket No. 52-048

Enclosure:
1. NRC Staff Interim Audit Report
for Containment and Ventilation Systems

cc: NuScale DC ListServ

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301-415-6616

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION STAFF INTERIM AUDIT REPORT FOR CONTAINMENT AND VENTILATION SYSTEMS (DOCKET NO. 52-048) DATED NOVEMBER 9, 2018

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| DATE | 10/19/2018 | 10/22/2018 | 11/8/2018 |

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGULATORY AUDIT OF CONTAINMENT AND VENTILATION SYSTEMS**

**AS PART OF THE NUSCALE POWER, LLC DESIGN CONTROL DOCUMENT REVIEW**

**INTERIM AUDIT SUMMARY REPORT FOR**

**APRIL 3, 2017 THROUGH AUGUST 31, 2018**

**NRC Audit Team:**

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- Zhe Yuan, ERI (NRC Contractor)
- Omid Tabatabai, NRO, Senior Project Manager

## I. AUDIT LOCATION AND DATES

The U.S. Nuclear Regulatory Commission (NRC) staff conducted the audit from NRC Headquarters in Rockville, Maryland, through NuScale's electronic reading room (eRR) and also at (1) the NuScale Office at 11333 Woodglen Drive, Suite 205, Rockville, Maryland 20852 and (2) NuScale Integral System Test (NIST-1) facility located at Oregon State University in Corvallis, Oregon. This interim audit summary report is for the period of April 3, 2017, through August 31, 2018.

## II. Background and Audit Basis

In a letter dated December 31, 2016, NuScale submitted to the U.S. Nuclear Regulatory Commission (NRC) Revision 0 of the NuScale Standard Plant Design Certification Application (DCA) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17013A229). The NRC staff initiated this DCA review on March 27, 2017. NuScale submitted Revision 1 of DCA to the NRC on March 15, 2018 (ADAMS Accession No. ML18086A090). Application documents for the NuScale design are available at the NRC Website at https://www.nrc.gov/reactors/new-reactors/design-cert/nuscale/documents.html.

The intent of this audit, in part, was to gain a more detailed understanding of the NuScale design in technical areas associated with containment and ventilation systems and identify information that will require docketing to support the basis of the regulatory decision. The NRC staff issued an audit plan on March 29, 2017, and an addenda on June 28, 2017 (ADAMS Accession Nos. ML17087A077 and ML18177A087, respectively). The addenda narrowed the audit scope by limiting it to three specific areas: containment pressure analysis, containment integrated leakage rate testing (ILRT), and containment Isolation. This interim audit summary report has been prepared in accordance with NRO-REG-108, "Regulatory Audits," Revision 0, April 2, 2009 (ADAMS Accession No. ML081910260).

## III. DOCUMENTS AUDITED

The NRC staff performed an audit of documents, as necessary, shown in the attachment.

## IV. Audit Activities and Summary of Findings

The audit activities included the following review areas:

- containment peak pressure analysis;
- containment heat removal;
- methodology of mass and energy release from the reactor coolant system;
- ASME qualification of the containment vessel;
- containment leak rate testing, including NuScale exemption request no. 7, "10 CFR 52, App. A, GDC 52 Containment Leakage Rate Testing";
- combustible gas control, including NuScale exemption request no. 2, "10 CFR 50.44 Combustible Gas Control";
- equipment survivability;
- containment isolation, including NuScale exemption request no. 9, "10 CFR 50, Appendix A, GDC 55, 56, and 57 Containment Isolation";
- containment flooding and drain;
- pipe break hazard analysis;
- NIST-1 test observation;
- range of reactor recirculation valve opening;
- containment stratification; and
- containment nodalization.

The NRC staff had numerous (more than 100) interactions with NuScale, including teleconferences, test observations, and face-to-face meetings. The audit enhanced the NRC staff's review of the NuScale DCA by providing an opportunity to review non-docketed

supporting design information that was not submitted with the DCA. Specifically, the audit documents that were made available to the NRC staff for review have enabled the staff to efficiently obtain the information that they need in order to continue their review and prepare their safety evaluation report. Furthermore, the audit allowed the NRC staff to limit issuing requests for additional information (RAIs), as needed, to:

- Gain a better understanding of the detailed calculations, analyses and/or bases underlying the formal application and confirm the staff's understanding of the NuScale application.

- Identify additional information, necessary for the applicant to supplement its application, assisting the staff to reach a regulatory decision.

- Establish an understanding in an area where the staff has identified potential concerns, and in turn allow the staff to issue clear RAIs enabling the applicant to provide quality and timely responses.

- Enhance the staff's understanding of the NuScale design in support of making a regulatory decision.

As stated in the June 28, 2018, addenda to the audit plan, the staff's supplemental containment audit involved three stages. Stage 1 included the staff visiting the NuScale's NIST-1 testing facility in Corvallis, Oregon, and observing the HP-49 test. The HP-49 test was to show that NRELAP5 code was capable of appropriately modeling the containment thermal hydraulic phenomena that would result from an inadvertent RRV-opening event as the limiting liquid-space discharge event. NuScale has identified this as the limiting peak containment pressure design basis event in the design certification application. Stage 2 was to audit the raw HP-49 test data, which the staff conducted on August 7 and 8, 2018, at NuScale's office in Rockville, Maryland. The main objective of Stage 2 was to verify the decay heat and peak containment pressure measurements at the NIST-1 test facility, and gather the initial conditions from the data set to be used in the staff's confirmatory NRELAP5 and TRACE calculations of the NIST-1 HP-49 test. The staff found that Stage 1 and Stage 2 audits met all stated objectives. Stage 3 is to audit NuScale's HP-49 post-test assessment report. NuScale provided this report on its eRR for audit in mid-September and the staff is currently auditing it. The staff will provide more details about the audit activities related to Stages 1 through 3 in a final audit summary report after completing the containment audit.

As part of the evaluation of NuScale's Exemption Request #7 on ILRT, staff issued RAI 9474 asking NuScale to show (through analysis, testing, or combination) that the maximum containment allowable leak rate is met and that containment leak tight integrity is restored after each refueling outage. Staff is currently evaluating NuScale's RAI response, including a revised analysis provided in EC-A013-1691, Revision 2, on the eRR. The staff is also reviewing this analysis for the containment ASME III design, and ASME inspection of flange bolts 2-inch diameter and smaller.

The June 28, 2017, addenda to the audit plan included containment isolation because of a staff's expectation that the audit may be needed to support reviewing NuScale's response to RAI 8836, Question 3.6.2-2, which was expected later on August 30, 2018. This RAI response was delayed until December 2018. However, the staff does not foresee now any plan for using the present audit to support reviewing the RAI-8836 response.

## V. CONCLUSION

This audit is currently in progress and the NRC staff will issue a final audit summary report after completing the audit.

**Attachment: Documents Audited by the Staff**

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 1 | 00002090_1_RPV and CNV Flange Geometry Stud.pdf | RPV and CNV Flange Geometry | 1 |
| 2 | 32-9257575-000 NuScale Reactor Core Chemical Deposition Analysis.pdf | NuScale Reactor Core Chemical Deposition Analysis | |
| 3 | 51-9257323-000 AIS for NuScale GSI-191 Evaluation.pdf | AIS for NuScale GSI-191 Evaluation | |
| 4 | DD-F010-4444_R0_Bioshield_Re-Design_to_Support_Environmental_Qualification_Profile.pdf | Bioshield Re-Design To Support Environmental Qualification Profile | 0 |
| 5 | DI-0303-51058_R0.pdf | NIST-1 Data Processing for Code Assessment Purposes | 0 |
| 6 | EC_0000_3853_R1_Calcs_to_Support_NIST-1_Distortion_Analysis_and_Modeling_of_Containment_and_Pool_Heat_Transfer | Calculations to Support NIST-1 Distortion Analysis and Modeling of Containment and Pool Heat Transfer | 1 |
| 7 | EC_A013_00003036_01_CNV_Ultimate_Pressure_Integrity_Analysis.pdf | CNV Ultimate Pressure Integrity Analysis | 1 |
| 8 | EC_A013_3377_R0_CNV_Primary_Stress_Analysis.pdf | Primary Stress Analysis of the Containment Vessel | 0 |
| 9 | EC_B020_2877_R1 ECCS Combustible Gas Analysis.pdf | ECCS Combustible Gas Analysis | 1 |
| 10 | EC_B020_4365_R0, Containment Gas Composition Calculation.pdf | Containment Gas Composition Calculation | 0 |
| 11 | EC_F010_5233_00_CNV_Support_Interface_with_RXB_Floor.pdf | CNV Interface with RXB Floor | 0 |
| 12 | EC-0000-2250-R0_Feedwater_Piping_Failure_Analysis.pdf | Feedwater Piping Failure Analysis | 0 |
| 13 | EC-0000-2714-R0_Steam_System_Piping_Failure_Analysis.pdf | Steam System Piping Failure Analysis | 0 |
| 14 | EC-0000-2786_R2_Failure_of_Small_Lines_Carrying_Primary_Coolant_Outside_Containment.pdf | Failure of Small Lines Carrying Primary Coolant Outside Containment | 2 |
| 15 | EC-0000-4718_R0_GOTHIC_HELB_Cases_of_NS_Top_of_Model_and_RXB_Pool_Room.pdf | GOTHIC HELB Cases of NuScale Top of Module RXB Pool Room | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 16 | EC-0000-4720_R1_NS_High_Energy_Line_Break_Scenario_Definition_Top_of_Module.pdf | NuScale High Energy Line Break Scenario Definition - Top of Module | 1 |
| 17 | EC-0000-4721 1_GOTHIC_HELB_Causes_of_NS_Top_of_Module_and_RXB_Pool_Room | GOTHIC HELB Cases of NuScale Top of Module RXB Pool Room | 1 |
| 18 | EC-0000-4745_R0_GOTHIC_HELIB_Cases_of_NS_Top_of_Module_and RXB_Pool_Room_BioShield_Blowout_Panels.pdf | GOTHIC HELB Cases of NuScale Top of Module and RXB Pool Room with Bioshield Blowout Panels Design | 0 |
| 19 | EC-0000-4746_R0_GOTHIC_HELIB_Cases_of_Revised_M&E_for_NS_Top_of_Module_and_RXB_Pool_Room.pdf | GOTHIC HELB Cases of Revised M&E for NuScale Top of Module and RXB Pool Room | 0 |
| 20 | EC-0000-5435-R0_final.pdf | Containment Pressure Initial Condition Sensitivity Calculations | 0 |
| 21 | EC-A010-2322-R3 Reactor Module Seismic Model.pdf | Reactor Module Seismic Model | 3 |
| 22 | EC-A010-3559-R3 Reactor Module Seismic Calculation.pdf | Reactor Module Seismic Calculation | 3 |
| 23 | EC-A010-4270-1.pdf | Long Term Cooling Analysis | 1 |
| 24 | EC-A013-1691_R0 Containment Vessel Flange Bolting Calculation.pdf | Containment Vessel Flange Bolting Calculation | 0 |
| 25 | EC-A013-2341 2 Contain Pressure Temperature Response Design Basis Events Analysis.pdf | Containment Pressure and Temperature Response to Design Basis Events | 2 |
| 26 | EC-A013-2341_R1 Containment Pressure and Temperature Response Design Basis Events Analysis.pdf | Containment Pressure and Temperature Response to Design Basis Events | 1 |
| 27 | EC-A030-4101, R0 Class 1 Piping Stress Analysis For RCS Discharge_Line.pdf | Class 1 Piping Stress Analysis For RCS Discharge Line | 0 |
| 28 | EC-B060-4543 0.pdf | GOTHIC Passive Cooling of NuScale Control Room Building | 1 |
| 29 | EC-B060-4544_ R0_GOTHIC_Passive_Cooling_Analysis_of_NS_RXB_Main_Pool_Room.pdf | GOTHIC Passive Cooling Analysis of NuScale RXB Main Pool Room | 1 |
| 30 | EC-B175-3253_R0 Ultimate Heat Sink Boil Off Calculation.pdf | Ultimate Heat Sink Boil Off Calculation | 0 |
| 31 | EC-F010-3108 Rev. 7.pdf | Seismic Soil-Structure Interaction Analysis of NuScale Reactor Building for ISRS Generation | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 32 | ECN_A010_4189_R0_For EQ-A010-3642 Correction to Table 3-1.pdf | Corrections to Table 3-1 Normal Operating Pressures and Temperatures for DHRS Lines (for EQ-A010-3642, 0) | 0 |
| 33 | ECN_A010_4575_R0 For EQ-A010-3642 Overpress Protect Require Steam Gen System Piping.pdf | Revision of Overpressure Protection Requirements for Steam Generator System Piping (for EQ-A010-3642, 0) | 0 |
| 34 | ECN_A010_4614_R0 For EQ-A010-2224 2nd Systems Contain Isolat Valves Design Spec Term Change.pdf | Secondary Systems Containment Isolation Valves Design Spec. Terminology Change (for EQ-A010-2224, 0) | 0 |
| 35 | ECN_A010_4981_R0 For EQ-A010-3642,RXM Class 1, 2, 3 Piping Design Spec. Terminology Change.pdf | RXM Class 1, 2, 3 Piping Design Spec. Terminology Change (for EQ-A010-3642, 0) | 0 |
| 36 | ECN_A010_5024_R0 For EQ-A010-2224 Material Specification Update.pdf | Material Specification Update (for EQ-A010-2224, 0) | 0 |
| 37 | ECN_B020_4991_R0 Add Evaluation of Hydrogen Mixing during ECCS operation.pdf | Add Evaluation of Hydrogen Mixing during ECCS Operation (for EC-BZ020-4365, 0) | 0 |
| 38 | ECN_B020_5023_R0 For EQ-B020-2140 Material Specification Update.pdf | Material Specification Update (for EQ-A010-2140, 2) | 0 |
| 39 | ECN_B030_4700_R0_For EQ-B030-2258 ASME Design Specs Decay Heat Removal System Actuat Valves.pdf | ASME Design Specification for Decay Heat Removal System Actuation Valves (for EQ-B030-2258, 0) | 0 |
| 40 | ECN_B030_4849_R0_For EQ-B030-2258 Decay Heat Remov Actuat Valves Load Combin Changes.pdf | Decay Heat Removal Actuation Valves Design Specification Terminology and Load Combination Changes (for EQ-B030-2258, 0) | 0 |
| 41 | ECN_B090_4290_Deisgn Solution for the HELB FR.pdf | Design Solution for the HELB FR (for SD-B090-1680, 0) | 0 |
| 42 | ECN_B090_4436_Add Passive Vent requirement to the FS.pdf | Add Passive Vent Requirements to the FS (for FS-B090-0533, 3) | 0 |
| 43 | ECN-0000_4908_R0 Containment Pressure and Temperature Updates ER-0000-4316.pdf | Containment Pressure and Temperature Updates (for ER-0000-4908, 1) | 0 |
| 44 | ECN-0000-4968_R0 Update Appendix A Table A-1 Environmental Zones ER-0000-4316.pdf | Update Appendix A Table A-1, Environmental Zones Required Update (for ER-0000-4316, 1) | 0 |
| 45 | ECN-0000-4998_R0 Various Updates to ER-0000-4316 Body, Figures and Tables.pdf | Various Updates to ER-0000-4316 Body, Figures and Tables (for ER-0000-436, 1) | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 46 | ECN-0000-5032_R0 For ER-0000-3921 Reorganization of Chapter 5.0.pdf | Reorganization of Chapter 5.0 (for ER-0000-3921, 0) | |
| 47 | ECN-0000-5033_R0 For ER-0000-3921 Misc Wording Adjustments Licensing Purposes.pdf | Miscellaneous Wording Adjustments for Licensing Purposes (for ER-0000-3921, 0) | 0 |
| 48 | ECN-0000-5036_R0 For ER-000-3921 Reorganization of Chapter 3.0.pdf | Reorganization of Chapter 3.0 (for ER-0000-3921, 0) | 0 |
| 49 | ECN-A010-4742_R0 For EQ-A010-2224 ASME Design Specs Second Systems Contain Isolation Valves.pdf | ECN for ASME Design Specification for Secondary Systems Containment Isolation Valves (for EQ-A010-2224, 0) | 0 |
| 50 | ECN-A013-5079_R0 For EC-A013-2341 Additional M&E Tables for Licensing.pdf | ECN for EC-A013-2341, 2 (Containment Pressure and Temperature Response to Design Basis Events) | |
| 51 | ECN-A013-5131_R2 For EC-A013-2341 O-RELAP v1.3.0 input decks for mass unit conversion.pdf | Adding M&E Tables for Licensing (for EC-A013-2341, 2) | 0 |
| 52 | ECN-B030-4744_R0 For EQ-B030-2258 ASME Design Specs Decay Heat Remov System Activat Valves.pdf | ECN for ASME Design Specification for Decay Heat Removal System Actuation Valves (for EQ-B030-2258, 0) | 0 |
| 53 | EC-T080-3822-R1.pdf | NRELAP5 Assessment Against NuScale Separate Effects High Pressure Condensation Test Series NIST-1 HP-02 | 1 |
| 54 | ED-F012-3661_ R2_BioShield_General_Arrangement_ and _Details.pdf | BioShield General Arrangements Details | 2 |
| 55 | EQ_A010_00002235_01_ASME_Design_Specification_for_Primary_Systems_Containment_Isolation_Valves.pdf | ASME Design Specification for Primary Systems Containment Isolation Valves | 1 |
| 56 | EQ_A011_00001775_01_ASME Design Specification for Reactor Pressure Vessel.pdf | ASME Design Specification for Reactor Pressure Vessel | 1 |
| 57 | EQ_A013_00001826_01_ASME Design Specification for Containment_Vessel.pdf | ASME Design Specification for Containment Vessel | 1 |
| 58 | EQ_B020_00002140_02_ASME_Design_Specification_for_Emergency_Core_Cooling_Valvespdf | ASME Design Specification for Emergency Core Cooling System Valves | 2 |
| 59 | EQ-A010-2224_R0 ASME Design Specification for Secondary System Containment Isolation Valves.pdf | ASME Design Specifications for Secondary Systems Containment Isolation Valves | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 60 | EQ-A010-2235_R0 ASME Design Specification for Primary Systems Containment Isolation Valves.pdf | ASME Design Specifications for Primary Systems Containment Isolation Valves | 0 |
| 61 | EQ-A010-3642_R0 ASME Design Specification for RXM Class 1 2 3 Piping.pdf | ASME Design Specifications for RXM Class 1, 2, and 3 Piping | 0 |
| 62 | EQ-A013-5418 R0 - ASME Design Specification for Containment EPAs.pdf | Design Specification for CNV Electrical Penetration Assemblies | 0 |
| 63 | EQ-B030-2258_R0 ASME Design Specification for Decay Heat Removal System Activation Valves.pdf | ASME Design Specification for Decay Heat Removal System Actuation Valves | 0 |
| 64 | ER_A010_2009_4_NuScale__Reactor_Module_Design_Parameters.pdf | NuScale Reactor Module Design Parameters | 4 |
| 65 | ER_A013_3246_R1 Containment Vessel Structural Eval for Combustible Gas.pdf | Containment Vessel Structural Evaluation for Combustible Gas | 1 |
| 66 | ER_B020_4364_R0_GSI_191_Assessment_of_Debris_Accumulation_on_PWR_Sump_Performance_Evaluation_of_Ex_Vessel_and_In_Vessel | GSI-191, Assessment of Debris Accumulation on Pressurized Water Reactor [PWR] Sump Performance - Evaluation of Ex-vessel and In-vessel Effects | 0 |
| 67 | ER_P000_7002_R0_PRA_Quantification_Notebook_.pdf | Probabilistic Risk Assessment Quantification Notebook | 0 |
| 68 | ER_P010_7007_R0_Accident_Sequence_Analysis_Notebook_wECN.pdf | Accident Sequence Analysis Notebook | 0 |
| 69 | ER_P010_7008_R0_Success_Criteria_Notebook_wECN.pdf | Success Criteria Notebook | 0 |
| 70 | ER_P020_00004896_00_Severe_Accident_Selection_Methodology.pdf | Severe Accident Selection Methodology | 0 |
| 71 | ER_P020_00004904_00_Hydrogen_Deflagration___Adiabatic_Isochoric_Complete_Combustion.pdf | Hydrogen Deflagration-Adiabatic Isochoric Complete Combustion | 0 |
| 72 | ER_P020_7024_R0_Level_2_Probabilistic_Risk_Assessment_Notebook_wECN | Level 2 Probabilistic Risk Assessment Notebook | 0 |
| 73 | ER_P060_00007077_A_TRN_16T__General_Transient_with_Two_Trains_of_DHRS__Reactor_Recirculation_Valve_Open__Loss_of_DC_Power_.pdf | TRN-16T: General Transient with Two Trains of DHRS and Reactor Recirculation Valves Open (Loss of DC Power) | A |
| 74 | ER_P060_4715_R0_TRN_07T__General_Transient_with_Stuck_Open_RSV_and_No_Mitigation.pdf | TRN-07: General Transient with Stuck Open Reactor Safety Valve and No Mitigation, from a PRA Level 2 Perspective | 0 |
| 75 | ER_P060_4724_R0 NuScale MELCOR Basemodel.pdf | NuScale MELCOR Basemodel | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 76 | ER_P060_4748_R0_LEC_06T__RVV_LOCA_with_No_Mitigation.pdf | LEC-06T: Reactor Vent Valve LOCA with No Mitigation, from a PRA Level 2 Perspective | 0 |
| 77 | ER_P060_4749_R0_LCC_05T__Charging_Line_Break_Inside_Containment_with_No_Mitigation.pdf | LCC-05T: Charging Line Break Inside Containment with No Mitigation, from a PRA Level 2 Perspective | 0 |
| 78 | ER_P060_4750_00_LCU_03T__Unisolated_Charging_Line_LOCA_Outside_Containment, No_Mitigation.pdf | LCU-03T: Unisolated Charging Line LOCA Outside Containment with No Mitigation, from a PRA Level 2 Perspective | 0 |
| 79 | ER_P060_4857_R0_LCC_05T__Charging_Line_Break_Inside_Cntmt_Complete_ECCS_Failure_wECN.pdf | LCC-05T: Charging Line Break Inside Containment with Complete ECCS Failure, from a PRA Level 2 Perspective | 0 |
| 80 | ER_P060_7047_R0_LCU_05T__Unisol_Chging_LOCA_Outside_CNV_w_CFDS, ECCS.pdf | LOU-05T: Unisolated Charging Line LOCA Outside Containment with CFDS and ECCS | 0 |
| 81 | ER_P060_7050_R0_LEC_09T__ECCS_Valve_LOCA_with_Charging_Injection.pdf | LEC-09T: ECCS Valve LOCA with Charging Injection | 0 |
| 82 | ER_P060_7075_00_TRN_08T__General_Transient_RSVs_Fail_to_Open_No_Mitigation.pdf | TRN-08T: General Transient with Reactor Safety Valves Failed to Open and No Mitigation | 0 |
| 83 | ER_P060_7076_R0_TRN_14A__General_Transient_with_Cycling_RSV__ATWS_.pdf | TRN-14A: General Transient with Cycling Reactor Safety Valve (ATWS) | 0 |
| 84 | ER_P060_7082_R0_NRELAP5_PRA_Base_Model.pdf | NuScale NRELAP5 Probabilistic Risk Assessment Base Model | 0 |
| 85 | ER-0000-2486 4 Safety Analysis Analytical Limits report.pdf | Safety Analysis Analytical Limits Report | 4 |
| 86 | ER-0000-2486 Revision 5.pdf | Safety Analysis Analytical Limits Report | 5 |
| 87 | ER-0000-3921_R0 Long Term Core Cooling Methodology Report.pdf | Long Term Core Cooling Methodology Report | 0 |
| 88 | ER-0000-4316_R1 Environ Service Conditions Electrical and Mechanical Equipment Qualification.pdf | Environmental Service Conditions for Electrical and Mechanical Equipment Qualifications | 1 |
| 89 | ER-0000-4391 0_Mass_and_Energy_Release_and_Containment_Vessel_Pressure_and_Temp_Response_Method | Mass and Energy Release and Containment Vessel Pressure and Temperature Response Methodology | 0 |
| 90 | ER-A013-3246_R0 Containment Vessel Structural Eval for Combustible Gas.pdf | Containment Vessel Structural Evaluation for Combustible Gas | 0 |

| No. | File | Document Name | Rev. # |
|---|---|---|---|
| 91 | ER-A013-3635_R0 Containment System Failure Modes and Effects Analysis.pdf | Containment System Failure Modes and Effects Analysis | 0 |
| 92 | ER-A013-4785 0.pdf | 10 CFR 50 Appendix J Containment Leakage Testing Assessment | 0 |
| 93 | ER-P020-5092_Rev_0 Assessment of LRSAP for NuScale level 2 PRA.pdf | Assessment of Low-Risk Severe Accident Phenomena for the NuScale Level 2 PRA | 0 |
| 94 | FS_B080_00000542_02_Control_Room_Normal_Ventilation.pdf | Control Room HVAC System (CRVS) Functional Specification | 2 |
| 95 | MSS SDD SD-C010-1722 0 Main Steam System Design Description.pdf | Main Steam System Design Description | 0 |
| 96 | OP-0000-10842_R0 Module Refueling Operations.pdf | NuScale Model Refueling Operations | 0 |
| 97 | RP-1215-19690 - concept of automation.pdf | Concept of Automation | A |
| 98 | SD_B090_00001680_R0_Reactor_Building_HVAC_System_Design_Description.pdf | reactor Building HVAC System (RBVS) System Design Description | 0 |
| 99 | SDR-0615-15509_R4.pdf | OSU NIST-1 Facility Description Report | 4 |
| 100 | SwUM-0304-15495 3 - NRELAP5 Version 1.3 Code Manual Appendix A - Input Requirements.pdf | NRELAP5 Version 1.3 Input Data Requirements | 3 |
| 101 | TR-0216-21604.pdf | Superseded Document NuScale Power Containment Vessel Integrated Leak Rate Testing Options | 0 |
| 102 | TR-0916-51502-P.pdf | NuScale Power Module Seismic Analysis | 0 |