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[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2015-0160]

NuScale Power, LLC, Design-Specific Review Standard and Safety Review Matrix

AGENCY: Nuclear Regulatory Commission.

ACTION: Design-specific review standard; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is soliciting public comment on the Design-Specific Review Standard (DSRS) and Safety Review Matrix for the NuScale Power, LLC, design (NuScale DSRS Scope and Safety Review Matrix). The purpose of the NuScale DSRS is to provide guidance to NRC staff in performing safety reviews where existing NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Standard Review Plans (SRP) have been modified by the staff specifically for the NuScale design, or do not address unique features of the NuScale design. The DSRS also allows NRC staff to more fully integrate the use of design-specific risk insights into the review of the NuScale design certification application (DC) or an early site permit (ESP) or combined license (COL) application that references the NuScale design.

DATES: Submit comments by **[INSERT DATE 60 DAYS FROM DATE OF PUBLICATION IN**

THE *FEDERAL REGISTER*]. Comments received after this date will be considered, if it is practical to do so, but the NRC is able to ensure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods (unless this document describes a different method for submitting comments on a specific subject):

- **Federal Rulemaking Web site:** Go to http://www.regulations.gov and search for Docket ID **NRC-2015-0160**. Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.

- **Mail comments to:** Cindy Bladey, Chief, Rules, Announcements, and Directives Branch (RADB), Office of Administration, Mail Stop: OWFN-12-H08, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

For additional direction on obtaining information and submitting comments, see "Obtaining Information and Submitting Comments" in the SUPPLEMENTARY INFORMATION section of this document.

FOR FURTHER INFORMATION CONTACT: Jenny Gallo, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-7367; e-mail: NuScale-DSRS@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments.

A. Obtaining Information.

Please refer to Docket ID **NRC-2015-0160** when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this action by any of the following methods:

- **Federal Rulemaking Web Site:** Go to http://www.regulations.gov and search for Docket ID **NRC-2015-0160**.

- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at http://www.nrc.gov/reading-rm/adams.html. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced (if it is available in ADAMS) is provided the first time that it is mentioned in the SUPPLEMENTARY INFORMATION section. The NuScale DSRS Scope and Safety Review Matrix is available in ADAMS under Accession No. ML15156B063.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

B. Submitting Comments

Please include Docket ID **NRC-2015-0160** in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at http://www.regulations.gov as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

II. Further Information.

A. Background.

In the Staff Requirements Memorandum (SRM) COMGBJ-10-0004/COMGEA-10-0001, "Use of Risk Insights to Enhance the Safety Focus of Small Modular Reactor Reviews," dated August 31, 2010 (ADAMS Accession No. ML102510405), the Commission provided direction to the NRC staff on the preparation for, and review of, small modular reactor (SMR) applications, with a near-term focus on integral pressurized-water reactor designs. The Commission directed the NRC staff to more fully integrate the use of risk insights into pre-application activities and the review of applications and, consistent with regulatory requirements and Commission policy statements, to align the review focus and resources to risk-significant structures, systems, and components and other aspects of the design that contribute most to safety in order to enhance the effectiveness and efficiency of the review process. The Commission directed the NRC staff to develop a design-specific, risk-informed review plan for each SMR design to address pre-application and application review activities. An important part of this review plan is the DSRS. The DSRS for the NuScale design is the result of the implementation of the Commission's direction.

B. DSRS for the NuScale Design.

The NuScale DSRS reflects current NRC staff safety review methods and practices which integrate risk insights and, where appropriate, lessons learned from the NRC's reviews of DC and COL applications completed since the last revision of the NUREG-0800, SRP Introduction, Part 2, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: Light-Water Small Modular Reactor Edition," January 2014 (ADAMS Accession No. ML13207A315). The NuScale DSRS Scope and Safety Matrix provides a complete list of SRP sections and identifies which SRP sections will be used for DC, COL, or ESP reviews concerning the NuScale design; which SRP sections are not applicable to the NuScale design; and which new DSRS sections are design-specific to NuScale. The NuScale DSRS Scope and Safety Review Matrix is available in ADAMS under Accession No. ML15156B063.

The NRC staff is soliciting public comment on the NuScale DSRS Scope and Safety Review Matrix and the individual NuScale-specific DSRS sections referenced in the table below. Specifically, the NRC requests comment on the sufficiency of the scope of the proposed NuScale review, as encompassed by the Safety Review Matrix, and on the technical content of the individual NuScale-specific DSRS sections identified in the table below. These sections were revised from the relative SRP sections or developed to incorporate design-specific review guidance based on features of the NuScale design. The NRC is not soliciting general comments on NUREG-0800 sections that are designated with the applicability "A) Use SRP Section " in the Safety Review Matrix, but specific comments on the adequacy of these NUREG-0800 sections for use in the review of the NuScale design certification application will be considered.

Section	Design-Specific Review Standard Title	ADAMS Accession No.
Matrix	NuScale Power, LLC DSRS Scope and Safety Review Matrix	ML15156B063
3.11	Environmental Qualification of Mechanical and Electrical Equipment	ML15131A247
3.13	Threaded Fasteners - ASME Code Class 1, 2, and 3	ML15084A277
3.3.1	Offsite Power System	ML15071A259
3.3.2	Tornado Loads	ML15071A267
3.4.1	Internal Flood Protection for Onsite Equipment Failures	ML15139A112
3.4.2	Analysis Procedures	ML15071A324
3.5.1.1	Internally Generated Missiles (Outside Containment)	ML15139A081
3.5.1.2	Internally Generated Missiles (Inside Containment)	ML15139A096
3.5.1.3	Turbine Missiles	ML15070A248
3.5.1.4	Missiles Generated by Tornadoes and Extreme Winds	ML15139A121
3.5.2	Structures, Systems, and Components to be Protected from Externally-Generated Missiles	ML15139A102
3.5.3	Barrier Design Procedures	ML15071A273
3.7.1	Seismic Design Parameters	ML15084A279
3.7.2	Seismic System Analysis	ML15084A177
3.7.3	Seismic Subsystem Analysis	ML15131A340
3.8.2	Steel Containment	ML15131A373
3.8.4	Other Seismic Category I Structures	ML15118A151
3.8.5	Foundations	ML15132A186
4.2	Fuel System Design	ML15132A517
4.3	Nuclear Design	ML15125A374
4.4	Thermal and Hydraulic Design	ML15131A427
4.5.2	Reactor Internal and Core Support Structure Materials	ML15070A325
4.6	Functional Design of Control Rod Drive System	ML15119A111
5.2.2	Overpressure Protection	ML15118A931
5.2.4	Reactor Coolant Pressure Boundary Inservice Inspection and Testing	ML15125A305
5.2.5	Reactor Coolant Pressure Boundary Leakage Detection	ML15132A194
5.3.1	Reactor Vessel Materials	ML15070A457
5.3.2	Pressure-Temperature Limits, Upper-Shelf Energy, and Pressurized Thermal Shock	ML15070A468
5.3.3	Reactor Vessel Integrity	ML15070A462
5.4	Rx Coolant System Component and Subsystem Design	ML15126A156
5.4.2.1	Steam Generator Materials	ML15131A376
5.4.2.2	Steam Generator Program	ML15070A562
5.4.7	Residual Heat Removal (RHR) System	ML15131A360
5-4 BTP	Design Requirements of the RHR System	ML15132A524
6.1.1	Engineered Safety Features Materials	ML15070A567

6.1.2	Protective Coating Systems (Paints) - Organic Materials	ML15071A372
6-1 BTP	pH for Emergency Coolant Water for PWRs	ML15125A369
6.2.1	Containment Functional Design	ML15118A922
6.2.1.1.A	PWR Dry Containments, Including Sub-atmospheric Containments	ML15118A264
6.2.1.3	Mass and Energy Release Analysis for Postulated Loss-of-Coolant Accidents (LOCAs)	ML15112A134
6.2.1.4	Mass and Energy Release Analysis for Postulated Secondary System Pipe Ruptures	ML15118A293
6.2.2	Containment Heat Removal Systems	ML15131A341
6.2.4	Containment Isolation System	ML15119A087
6.2.5	Combustible Gas Control in Containment	ML15119A090
6.2.6	Containment Leakage Testing	ML15119A084
6.2.7	Fracture Prevention of Containment Pressure Boundary	ML15112A517
6.3	Emergency Core Cooling System	ML15125A322
6.6	Inservice Inspection and Testing of Class 2 and 3 Components	ML15127A136
7.0	Instrumentation and Controls - Introduction and Overview of Review Process	ML15125A340
7.0, A	Instrumentation and Controls - Hazard Analysis	ML15132A583
7.0, B	Instrumentation and Controls - System Architecture	ML15132A603
7.0, C	Instrumentation and Controls - Simplicity	ML15132A611
7.0, D	Instrumentation and Controls - References	ML15132A618
7.1	I&C - Fundamental Design Principles	ML15125A335
7.2	Instrumentation and Controls - System Characteristics	ML15125A360
8.1	Electric Power - Introduction	ML15146A269
8.2	Offsite Power System	ML15125A425
8-2 BTP	Use of Diesel-Generator Sets for Peaking	Ml15131A386
8.3.1	AC Power Systems (Onsite)	ML15125A384
8.3.2	DC Power Systems (Onsite)	ML15125A386
8-3 BTP	Stability of Offsite Power Systems	ML15125A390
8.4	Station Blackout	ML15126A149
8-6 BTP	Adequacy of Station Electric Distribution System Voltages	ML15131A461
9.1.2	New and Spent Fuel Storage	ML15125A307
9.1.3	Spent Fuel Pool Cooling and Cleanup System	ML15146A034
9.2.6	Condensate Storage Facilities	ML15131A245
9.3.2	Process and Post-Accident Sampling Systems	ML15131A298
9.3.4	Chemical and Volume Control System (PWR) (Including Boron Recovery System)	ML15131A305
9.3.6	Containment Evacuation and Flooding Systems	ML15112A190
9.5.2	Communications Systems	ML15084A403
9.5.3	Lighting Systems	ML15112A148
10.2	Turbine Generator	ML15126A086

10.2.3	Turbine Rotor Integrity	ML15127A046
10.3	Main Steam Supply System	ML15131A329
10.4.1	Main Condensers	ML15127A049
10.4.2	Main Condenser Evacuation System	ML15127A349
10.4.3	Turbine Gland Sealing System	ML15126A477
10.4.4	Turbine Bypass System	ML15131A417
10.4.5	Circulating Water System	ML15126A467
10.4.6	Condensate Cleanup System	ML15118A943
10.4.7	Condensate and Feedwater System	ML15126A470
10.4.10	Auxiliary Boiler System	ML15131A261
11.1	Source Terms	ML15112A526
11.2	Liquid Waste Management System	ML15124A607
11.3	Gaseous Waste Management System	ML15112A694
11.4	Solid Waste Management System	ML15119A057
11.5	Process and Effluent Radiological Monitoring Instrumentation and Sampling Systems	ML15118A609
11.6	Guidance on I&C Design Features for Process and Effluent Radiological Monitoring and Area Radiation and Airborne Radioactivity Monitoring	ML15125A367
12.2	Radiation Sources	ML15070A194
12.3-12.4	Radiation Protection Design Features	ML15070A204
12.5	Operational Radiation Protection Program	ML15070A210
14.2	Initial Plant Test Program - Design Certification and New License Applicants	ML15084A407
14.3.2	Structural and Systems Engineering - Inspections, Tests, Analyses, and Acceptance Criteria	ML15084A411
14.3.4	Reactor Systems - Inspections, Tests, Analyses, and Acceptance Criteria	ML15125A294
14.3.5	Instrumentation and Controls - Inspections, Tests, Analyses, and Acceptance Criteria	ML15127A383
14.3.6	Electrical Systems - Inspections, Tests, Analyses, and Acceptance Criteria	ML15127A373
14.3.7	Plant Systems - Inspections, Tests, Analyses, and Acceptance Criteria	ML15131A328

15.0	Introduction - Transient and Accident Analyses	ML15125A297
15.0.3	Design Basis Accidents Radiological Consequence Analyses for Advanced Light Water Reactors	ML15127A387
15.1.1 - 15.1.4	Decrease in FW Temperature, Increase in FW Flow, Increase in Steam Flow, and Inadvertent Opening of a Steam Generator Relief or Safety Valve	ML15127A391
15.1.5	Steam System Piping Failures Inside and Outside of Containment (PWR)	ML15125A317
15.1.6	Loss of Containment Vacuum	ML15127A395
15.2.1- 15.2.5	Loss of External Load; Turbine Trip; Loss of Condenser Vacuum; Closure of Main Steam Isolation Valve (BWR); and Steam Pressure Regulator Failure (Closed)	ML15127A400
15.2.6	Loss of Non-Emergency AC Power to the Station Auxiliaries	ML15125A292
15.2.7	Loss of Normal Feedwater Flow	ML15125A293
15.2.8	Feedwater System Pipe Breaks Inside and Outside Containment (PWR)	ML15118A927
15.4.1	Uncontrolled Control Rod Assembly Withdrawal from a Subcritical or Low Power Startup Condition	ML15118A482
15.4.2	Uncontrolled Control Rod Assembly Withdrawal at Power	ML15118A600
15.4.3	Control Rod Misoperation (System Malfunction or Operator Error)	ML15131A364
15.4.6	Inadvertent Decrease in Boron Concentration in the Reactor Coolant (PWR)	ML15118A474
15.5.1- 15.5.2	Chemical and Volume Control System Malfunction that Increases Reactor Coolant Inventory	ML15125A463
15.6.5	LOCAs Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary	ML15131A334
15.6.6	Inadvertent Opening of a PWR Pressurizer Pressure Relief Valve	ML15125A467
15.9A	Thermal-hydraulic Stability	ML15131A311
16.0	Technical Specifications	ML15131A316

Dated at Rockville, Maryland, this 23rd day of June, 2015.

For the Nuclear Regulatory Commission.

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