

May 21, 2018

Docket No. 52-048

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Submittal of Changes to Final Safety Analysis Report, Section 5.2, *Integrity of Reactor Coolant Boundary*

REFERENCES: Letter from NuScale Power, LLC to Nuclear Regulatory Commission, "NuScale Power, LLC Submittal of the NuScale Standard Plant Design Certification Application, Revision 1," dated March 15, 2018 (ML18086A090)

During review of the NuScale Power, LLC (NuScale) Final Safety Analysis Report (FSAR) and associated engineering documents, NuScale identified clarifications and items that required correction. Specifically, during review of FSAR section 5.2, *Integrity of Reactor Coolant Boundary*, NuScale identified that Table 5.2-4, *Reactor Coolant Pressure Boundary Component and Support Materials Including Reactor Vessel, Attachments, and Appurtenances*, and Table 5.2-7, *Reactor Vessel Internals Inspection Elements*, contained information that required correction. The Enclosure to this letter provides a mark-up of the FSAR pages incorporating revisions to Section 5.2 in redline/strikeout format. NuScale will include this change as part of a future revision to the NuScale Design Certification Application.

This letter makes no regulatory commitments or revisions to any existing regulatory commitments.

Please feel free to contact Carrie Fosaaen, Licensing Project Manager (LPM) at (541) 452-7126 or at cfosaaen@nuscalepower.com if you have any questions.

Sincerely,



Zackary W. Rad
Director, Regulatory Affairs
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Enclosure: "Changes to NuScale Final Safety Analysis Report Section 5.2, Integrity of Reactor Coolant Boundary"

Enclosure:

“Changes to NuScale Final Safety Analysis Report Section 5.2, Integrity of Reactor Coolant Boundary”

RAI 05.02.03-1, RAI 05.02.03-9, RAI 05.02.03-12, RAI 05.03.01-3, RAI 05.04.02.01-6, RAI 06.01.01-3, RAI 08.01-2

Table 5.2-4: Reactor Coolant Pressure Boundary Component and Support Materials Including Reactor Vessel, Attachments, and Appurtenances

Component	Specification	Alloy Designation (Grade, Class, or Type) ¹
Reactor Vessel		
Lower RPV section flange shell RPV bottom head Core support blocks	SA-508	Grade 3, Class 1
RPV top head PZR Shell Integral steam plenum Upper RPV flanged transition shell Steam plenum access ports Upper RPV SG shell Lower RPV SG shell Feed plenum access ports	SA-508	Grade 3, Class 2
RPV support gussets RPV support plates	SA-533	Type B, Class 2
Core barrel guides	SA-479 or SA-240	Type 304 with 0.03% max carbon
Pressure instrument tap swagelok reducers Threaded inserts for: RSV flanges RPV instrument seal assemblies instrumentation and controls (I&C) access ports PZR heater access ports Steam plenum access ports Feed plenum access ports	SA-479	Type 304/304L
RPV instrument seal assemblies I&C access port covers	SA-240	Type 304/304L
I&C access port cover threaded fasteners RPV instrument seal assemblies set screws	SB-637 SA-193	Alloy 718 (UNS N07718) B8, Class 1
RPV instrument seal assemblies swagelok male connectors	SA-479	Type 316/316L
RPV flange leak detection tube	SA-312	Type 316L; Seamless
Threaded fasteners, nuts, and washers for: Main RPV flange RSV flanges RPV instrument seal assemblies I&C access ports PZR heater access ports Steam plenum access ports Feed plenum access ports	SB-637	Alloy 718 (UNS N07718)
PZR pressure taps Thermowell nozzles	SB-166	Alloy 690 (UNS N06690)

RAI 04.05.02-2, RAI 05.04.02.01-6

Table 5.2-7: Reactor Vessel Internals Inspection Elements

Description	Location	Examination Category	Examination Method	Notes
Core Support Components				
Reflector Block - Bottom	Core Support Assembly	B-N-3	VT-3	
Reflector Block Intermediate	Core Support Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1. Exam will be of the interior surface, checking for a gap developing between reflector blocks.
Reflector Block Top	Core Support Assembly	B-N-3	VT-3	
Reflector Block Alignment Pins	Core Support Assembly	B-N-3	VT-1	Inspection only required when reflector blocks are removed for another reason
Core Barrel	Core Support Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1 of accessible surfaces
Lower core Plate	Core Support Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1 of accessible surfaces
Upper Core Plate	Lower Riser Assembly	B-N-3	VT-3	
Lower Core Plate Alignment Pins	Core Support Assembly	B-N-3	VT-3	
Upper Support Block	Core Support Assembly	B-N-2	VT-1	
Core Barrel to Lower Core Plate	Core Support Assembly	B-N-2	VT-1	
Fuel Pins	Lower Riser Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1
Fuel Pins Caps	Lower Riser Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1
Fuel Pin Capture Weld	Lower Riser Assembly	B-N-2	VT-1	
Shared Fuel Pins and Nuts	Core Support Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1
Lower Riser to Upper Core Plate	Lower Riser Assembly	B-N-3	VT-3	
ICIGT Bottom Flag ICIGT 1 to Upper Core Plate	Lower Riser Assembly	B-N-3	VT-1	Required VT-3 augmented to VT-1
Upper Seismic Belleville Washers	Core Support Assembly	B-N-3	VT-3	
Lower Seismic Belleville Washers	Core Support Assembly	B-N-3	VT-1	VT-1 measurement of the lower core plate height relative to the core support block
Upper Seismic Belleville Retaining Nut	Core Support Assembly	B-N-3	VT-3	

Table 5.2-7: Reactor Vessel Internals Inspection Elements (Continued)

Description	Location	Examination Category	Examination Method	Notes
Lower Seismic Retaining Pin	Core Support Assembly	B-N-3	VT-3	
Internal Structures				
CRA Cards	Lower Riser Assembly	N/A	VT-3	
ICI Guide Tubes	Lower Riser Assembly	N/A	VT-3	
ICI Guide Tubes (Upper)	Upper Riser Assembly	N/A	VT-3	
ICI Guide Tubes Bottom Flag	Lower Riser Assembly	N/A	VT-1	Required VT-3 augmented to VT-1
CVCS Makeup Piping Assembly	Upper Riser Assembly	N/A	VT-3	
Upper CRDS Support	Upper Riser Assembly	N/A	VT-3	
Upper Hanger Assembly Fasteners	Upper Riser Assembly	N/A	VT-3	
Upper Hanger Ring & Reinforcements	Upper Riser Assembly	N/A	VT-3	
Lower Riser Section	Lower Riser Assembly	B-N-1 N/A	VT-3	
Lower Riser Trunnion	Lower Riser Assembly	B-N-1 N/A	VT-3	
Lower Riser Spacer	Lower Riser Assembly	B-N-1 N/A	VT-3	
Lower Riser Spacer to Lower Riser Section	Lower Riser Assembly	B-N-1 N/A	VT-3	
Lower Riser Transition to Lower Riser Spacer	Lower Riser Assembly	B-N-1 N/A	VT-3	
ICIGT Support to Lower Riser Transition	Lower Riser Assembly	B-N-1 N/A	VT-3	
ICIGT Support to ICIGT	Lower Riser Assembly	B-N-1 N/A	VT-3	
ICIGT Bottom Flag to ICIGT	Lower Riser Assembly	B-N-1 N/A	VT-3	
CRA Guide Tube Support Plate to Lower Riser Spacer	Lower Riser Assembly	B-N-1 N/A	VT-3	
CRA Lower Flange to CRA Guide Tube	Lower Riser Assembly	B-N-1	VT-3	
CRA Card to CRA Guide Tube	Lower Riser Assembly	B-N-1	VT-3	
CRDS Alignment Cone <u>CRA Guide Tube Assembly (including Guide Cards)</u>	Lower Riser Assembly	B-N-1 N/A	VT-3	
Upper Riser Section Seam	Upper Riser Assembly	B-N-1 N/A	VT-3	
Lateral Support Pad	Upper Riser Assembly	B-N-1 N/A	VT-3	
Riser Backing Strip A	Upper Riser Assembly	B-N-1 N/A	VT-3	

Table 5.2-7: Reactor Vessel Internals Inspection Elements (Continued)

Description	Location	Examination Category	Examination Method	Notes
Riser Backing Strip B	Upper Riser Assembly	B-N-1 N/A	VT-3	
Upper CRDS Support	Upper Riser Assembly	B-N-1 N/A	VT-3	
Brace to Upper Riser Hanger Ring	Upper Riser Assembly	B-N-1 N/A	VT-3	
Brace to Upper Riser Section	Upper Riser Assembly	B-N-1 N/A	VT-3	
Upper Riser to Bellows	Upper Riser Assembly	B-N-1 N/A	VT-3	
Bellows to Upper Riser Transition	Upper Riser Assembly	B-N-1 N/A	VT-3	
Pipe to Bellows	Upper Riser Assembly	B-N-1 N/A	VT-3	
Elbow to Flexible Pipe	Upper Riser Assembly	B-N-1 N/A	VT-3	
Flexible Pipe to Rigid Pipe	Upper Riser Assembly	B-N-1 N/A	VT-3	
Brace to Pipe	Upper Riser Assembly	B-N-1 N/A	VT-3	
Pipe to Cap	Upper Riser Assembly	B-N-1 N/A	VT-3	
ICI Centering Plate 1-12	Upper Riser Assembly	B-N-1 N/A	VT-3	
ICIGT Link to Upper Riser Hanger Ring	Upper Riser Assembly	B-N-1 N/A	VT-3	
Injection to RPV11	Upper Riser	B-N-1 N/A	VT-3	
ICIGT to Integrated Steam Plenum	PZR	B-N-1 N/A	VT-3	
Pressurizer Spray Nozzle	PZR Spray Nozzle to Safe End (RPV14-RPV15)	B-N-1 N/A	VT-3	
Surveillance Capsule	Core Support Assembly	B-N-1 N/A	VT-3	
Steam Generator				
Col 01-21 Tube Support Top/Bottom Sections to Tube Support middle Section	SG	N/A	General Visual	Augmented exam. Examine where accessible.
Col 01-21 Outer Spacer to Tube Support	SG	N/A	General Visual	Augmented exam. Examine where accessible.
Col 01-21 Middle Spacer to Tube Support	SG	N/A	General Visual	Augmented exam. Examine where accessible.