NuScale Power™

LO-0817-55529

August 21, 2017

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 6.1.1

REFERENCES: Letter from NuScale Power LLC, to Nuclear Regulatory Commission, "NuScale Power, LLC Submittal of the NuScale Standard Plant Design Certification Application," dated December 31, 2016 (ML17013A229)

During an August 7, 2017 closed teleconference with Mr. Omid Tabatabai and Mr. Nicholas McMurray of the NRC staff, NuScale Power, LLC (NuScale) discussed potential updates to Final Safety Analysis Report (FSAR), Section 6.1.1. As a result of this discussion, NuScale changed Section 6.1.1. The Enclosure to this letter provides a mark-up of the FSAR pages incorporating revisions to Section 6.1.1, 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 Marty Bryan at (541) 452-7172 or at mbryan@nuscalepower.com if you have any questions.

Sincerely,

Zackary W. Rad
Director, Regulatory Affairs
NuScale Power, LLC

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Enclosure: "Changes to NuScale Final Safety Analysis Report Section 6.1.1 "

Enclosure:

"Changes to NuScale Final Safety Analysis Report Section 6.1.1 "

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The DHRS consists of two redundant trains, each including a passive condenser with piping. With the exception of some portions of the steam side piping, the DHRS is immersed within the reactor pool. The DHRS piping including the portion that penetrates the CNV boundary is designed to ASME Class 2 criteria. The DHRS piping material internal and external to the CNV is selected to be compatible with the secondary fluid in contact with the DHRS components and with borated water present in the reactor coolant system and the reactor pool. A more detailed discussion and description of the DHRS is provided in Section 5.4.

Over the life of the plant, the interior and/or exterior surfaces of ESF components, with the exception of the CNV head exterior, and the non-ESF piping and components within the CNV are routinely exposed to borated reactor coolant and/or borated reactor pool water. The CNV is partially immersed and DHRS condensers as well as the ECCS valve actuator assemblies are submerged in the reactor pool.

Socket welds are not used for piping in Table 6.1-1 and Table 6.1-2, including piping of NPS 2 or less in size.

During normal power operations the interior environment of the CNV is maintained dry, at a partial vacuum. The CNV is partially flooded with reactor pool water during cooldown prior to the movement of an NPM for refueling operations.

Emergency core cooling for the NuScale plant is facilitated by the reactor coolant discharged into the CNV. Reactor coolant chemistry is maintained consistent with the guidance found in the EPRI PWR Primary Water Chemistry Guidelines. As a result, during transients or accidents that result in reactor coolant discharge into the CNV, interior components are exposed to the same chemistry controlled coolant that is used in day- to-day operations. ESF component materials that are exposed to primary reactor coolant (internally or externally) are selected to be compatible with reactor coolant chemistry and the NuScale design prohibits the use of materials within the CNV that could significantly alter post-accident coolant chemistry. Additional information on reactor coolant water chemistry is located in Section 5.2.3.

The materials for ESF components that are partially immersed within the reactor pool are selected to be compatible with the reactor pool chemistry conditions maintained in the pool. No significant corrosion is expected based on the purity of the reactor pool water outside of the CNV. Section 9.1.3 describes operation of the pool cleanup system that maintains reactor pool water chemistry within the expected range of values shown on Table 9.1.3-2. A corrosion allowance is not included for ESF materials exposed to process fluids or reactor pool chemistry.

Piping, supports and components associated with CFDS and located in the CNV interior but defined as part of the CNTS are designed to be compatible with the reactor coolant chemistry that would be present under operation of ECCS conditions. The CNTS piping, fittings, pipe supports and components are constructed of austenitic stainless steel Type ~~304 or 304L~~304/304L with a carbon content not exceeding 0.03% to mitigate intergranular attack and are ASME Class 2 components. Non-ESF components in the CNV are listed in Table 6.1-2.

Piping, supports, and components associated with the functional systems that communicate through the CNV boundary and defined RCS or SGS are designed to be compatible with the reactor coolant chemistry that would be present under ECCS operation conditions. The RCS and SGS piping, fittings, pipe supports and components interior to the CNV are constructed of austenitic stainless steel Type ~~304 or 304L~~304/304L with a carbon content not exceeding 0.03% to mitigate intergranular attack and are designed to ASME Class 1 or Class 2 criteria as appropriate for the associated functional system. Non-ESF components in the CNV are listed in Table 6.1-2. Vendor supplied material supports conform to the fabrication, construction, and testing requirements of ASME ~~BPV Code,~~BPVC, Sections II and III and are compatible with the coolant system fluids.

No materials, paint or coatings are used within the NuScale CNV that contribute to corrosion related hydrogen production or alters post-LOCA coolant chemistry to enhance stress corrosion cracking of austenitic stainless steel.

6.1.2 Organic Materials

Protective coatings are not permitted on the inside or outside surface of the CNV, or on any other ESF or non-ESF system components located within the CNV.

Cabling that runs through the CNV is unpainted corrosion resistant, seamless construction, type 304L, stainless steel jacketed, mineral (silicon dioxide) insulated cabling. The cable material is designed free of organic material in the insulation and sheath.

Table 6.1-2: Material Specifications for CNV Related non-ESF Components

Component	Material/Grade/Type
Containment Flood and Drain System	
Piping	SA-312, Grade TP304/304L
Piping Supports and Guides (flat plates, supports and rotational restraint)	SA-240, Type 304/304L SA-479, Type 304/304L
Coupler	SA-182, Grade F304/F304L
Reactor Coolant System (CVCS, RSVs)	
Piping	SA-312, Grade TP304/304L
Piping Supports (short, long, tube)	SA-479, Type 304/304L
Pressurizer Support Anchor and Support Plate 180 Degree Piping Supports 90 Degree Piping Supports	SA-240, Type 304/304L
Tee connection to ECCS Reset Valves	SA-182, Grade F304/F304L
Check valves and Excess Flow Check Valves	Stainless Steel
Reactor Safety Valves	Stainless Steel
Control Rod Drive System	
Piping	SA-312, Grade TP304/304L
Supports (brackets and bolts)	SA-479, Type 304/304L
Nozzle fittings, pipe caps, reducers, flange weld neck	SA-182, Grade F304/F304L
Flex hose	TP316L stainless steel
Steam Generator System	
Piping	SA-312, Grade TP304/304L
Piping Supports	SA-479, Type 304/304L
Piping reducers and elbows	SA-182, Grade F304/F304L
Weld Filler Materials (stainless steel to be compatible with base material)	SFA-5.4: E308, E308L, E309, E309L, E316, E316L SFA-5.9: ER308, ER308L, E309, E309L, ER316, ER316L
Instrumentation	
Sensor Line Tubing	SA-312, Grade Type 316L SMLS
Instrument Enclosure (Base and Cover)	SA-182, Grade F304/F304L
Swageloks	SS304
Nuts and Studs	A479-74, Grade XM-19
Flat Washers	SA-240, Type 304
Sensor Cabling (Sheath)	TP304L Stainless Steel

Note:

1) Carbon content of unstabilized Type 3XX weld filler materials is restricted to 0.03% maximum.