

Response to SDAA Audit Question

Question Number: A-16.3.3.1-1

Receipt Date: 09/18/2023

Question:

Generic TS Section 1.1 defines PASSIVELY COOLED – PASSIVE COOLING as follows:

"A module is in PASSIVE COOLING or is being

PASSIVELY COOLED when:

a. One or more reactor vent valves are open and one or

more reactor recirculation valves are open, or

b. One or more trains of DHRS is in operation, or

c. Water level in the containment vessel is > 45 ft.

The following LCO 3.3.1 Functions specify ACTIONS Condition I and, except for Function 23.a, include in the Applicability:

"MODE 3 (f) When not PASSIVELY COOLED.":

- 7.b DHRS actuation on High Pressurizer Pressure
- 7.c SSI actuation on High Pressurizer Pressure
- 13.b DHRS actuation on High Narrow Range RCS Hot Temp.

13.c SSI actuation on High Narrow Range RCS Hot Temp.

- 17.b DHRS actuation on High Main Steam Pressure
- 17.c SSI actuation on High Main Steam Pressure
- 23.a ECCS actuation on Low RPV Riser Level
- 24.a ECCS actuation on Low Low RPV Riser Level

ACTIONS Condition I applies after 6 hours of discovery that any of the above Functions has one or two channels still inoperable or immediately if three or more channels are inoperable, and requires being in MODE 2 within 6 hours and in MODE 3 and PASSIVELY COOLED within 36 hours.



The following LCOs include in the Applicability "MODE 3 and not PASSIVELY COOLED":

3.4.9 Steam Generator (SG) Tube Integrity (Condition B)

- 3.5.1 Emergency Core Cooling System (ECCS) (Condition B)
- 3.5.2 Decay Heat Removal System (DHRS) (Condition B)
- 3.5.3 Ultimate Heat Sink (Condition C)
- 3.7.1 Main Steam Isolation Valves (MSIVs) (Condition C)
- 3.7.2 Feedwater Isolation (Condition D)

The ACTIONS of each of these LCO subsections specify, for the listed default Condition, Required Actions to be in MODE 2 within 6 hours and in MODE 3 and PASSIVELY COOLED within 36 hours.

Issue: Why are 36 hours appropriate for reaching MODE 3 >= 345 deg F and PASSIVELY COOLED from full power operation, when MODE 2 entry is required within 6 hours, and MODE 3 can be entered without needing to further reduce RCS temperature by just initiating PASSIVE COOLING using just one train of the DHRS?

Response:

NuScale established these actions using the same philosophy utilized for other generic Technical Specifications. Each additional step in the shutdown includes time for planning and potential corrective action before requiring the operators to move to the next level of shutdown. The operator is required to flood containment in many of these cases. Flooding the containment drives the facility to cold shutdown. As is the practice in the existing industry, operators act more quickly to reach the passive cooling condition if it is clear that a condition forcing progression to shutdown and passive cooling can only be addressed in a cold shutdown condition.

Follow-Up Discussion

During a follow-up call with the NRC Staff, NuScale agreed to provide a narrative describing the transition of a NuScale Power Module (NPM) to Mode 4.



Supplemental Response

The following narrative summarizes a normal downpower, shutdown, and cooldown in order to support a typical refueling outage cycle for an NPM.

Downpower and Shutdown

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}}^{2(a),(c),ECI}



Plant Cooldown

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}}^{2(a),(c),ECI}

NuScale Nonproprietary

}}^{2(a),(c),ECI}



Opening the ECCS valves

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}}^{2(a),(c),ECI}

NPM movement preparation

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}}^{2(a),(c),ECI}

No changes to the SDAA are necessary.