

Response to SDAA Audit Question

Question Number: A-16.3.5.1-2

Receipt Date: 09/18/2023

Question:

In SDAA generic TS Bases Subsection B 3.5.1, the Background section includes the following paragraph on page B 3.5.1-3:

"The ECCS values are sized to ensure that sufficient pressure equalization exists to support core cooling when at least one RVV and at least one RRV have opened."

Suggest removing the two instances of the phrase "at least" because this phrase does not add to the clarity of the statement.

Response:

NuScale revises the second paragraph on Page B 3.5.1-3 of the Technical Specification 3.5.1 Bases to read:

"The ECCS valves are sized to ensure that sufficient pressure equalization exists to support core cooling when one RVV and one RRV have opened."

Markups of the affected changes, as described in the response, are provided below:

BASES

BACKGROUND (continued)

Heat is transferred to the containment vessel walls by steam condensation on the containment interior, and then removed from the containment vessel by heat conduction through the containment vessel wall. In addition to mass transfer by steam flow, heat is removed by conduction through the reactor vessel walls during ECCS operation because the lower portions of the reactor vessel walls are submerged and wetted by coolant on both sides. Heat is removed from the containment wall through contact with the reactor pool, which acts as the ultimate heat sink (UHS).

The ECCS valves are sized to ensure that sufficient pressure equalization exists to support core cooling when at least one RVV and at least one RRV have opened.

In MODES 1, 2, and 3 the ECCS actuates when the reactor vessel riser level is low indicating a loss of RCS inventory. This actuation occurs at about 470 inches above the bottom of the module assembly, and at about 550 inches above the bottom of the module assembly if the RCS cold temperature is above the T-5 interlock (approximately 440 °F). These setpoints ensure that the ECCS actuates before the upper riser holes are uncovered and upon riser uncover, respectively.

Specification 3.3.1 describes the instrumentation and actuation logic for ECCS actuation. In applicable design basis accident scenarios, the actuation setpoints and the RRV mechanical pressure interlock operation are sufficient to ensure the core remains cooled and covered.

In MODE 3 the RVVs provide Low Temperature Over-Pressure(LTOP) protection for the RCS as described in LCO 3.4.10.

In MODE 3 in PASSIVE COOLING, the ECCS is either performing its design function to support the transfer of decay heat from the reactor core to the containment vessel or alternative means of removing decay heat have been established and the system is no longer required to be OPERABLE.

In MODE 4 the ECCS is not required because the ECCS valves are open and de-energized, and the unit is being passively cooled, which ensures decay heat removal is being accomplished. Additionally, in MODE 4 during module relocation between the containment tool and the reactor tool, the de-energized and opened RRVs are open between the UHS water inside the containment and the RCS. In MODE 5, core cooling is accomplished by conduction through the RPV wall to the ultimate heat sink until the upper containment and upper