

## Response to NuScale Technical Report Audit Question

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**Question Number:** A-16.3.6.3-1

**Receipt Date:** 04/29/2024

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**Question:**

TR-101310-NP, Rev. 0, “ US460 Standard Design Approval Technical Specifications Development,” Section 3.3.17, “Addition of Limiting Condition [for] Operation 3.6.3, Containment Closure,” states in part:

“Maintaining containment closure ensures that the decay heat removal mechanism required to assure core cooling is maintained during periods when the module is isolated from other systems such as CVCS, or *when the containment is disassembled from the UHS via the de-energized ECCS valves.*”

The applicant is requested to clarify the intended meaning of the passage denoted by italics.

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**Response:**

NuScale revises technical report TR-101310, “US460 Standard Design Approval Technical Specifications Development,” Section 3.3.17 to provide a clearer explanation of the need to maintain containment closure conditions.

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

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**3.3.15 Modification of Limiting Condition effor Operation 3.5.3, Ultimate Heat Sink**

The ultimate heat sink (UHS) is redesigned consistent with the other changes to the plant design and analyses, primarily the increased RTP and a reduction in the number of reactors in the design to a maximum of six modules. The redesign resulted in reanalysis and redefinition of the UHS and caused changes in the credited functions of the UHS in LCO 3.5.3.

The UHS water level requirements are specified to a new band defined by upper and lower limits that improve containment heat removal behavior. The redesigned UHS and its functions are described in FSAR Section 9.2.5. The new limits are consistent with the safety analyses in the FSAR that credit the UHS function. Similarly, the maximum bulk average pool temperature is increased to align with the safety analyses assumptions. The structure of the Actions in LCO 3.5.3 are changed to reflect the removal of distinct limits that the DCA credited for separate safety functions. This change removed the need for Condition B of the DCA technical specifications, which is now addressed by Condition A. Completion Times remain consistent with the credited functions of the UHS. Subsequent Conditions are renumbered. Corresponding changes are made to the Bases.

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**3.3.16 Addition of Limiting Condition effor Operation 3.5.4, Emergency Core Cooling System Supplemental Boron**

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The US460 design adds a passive system that provides soluble boron in dissolvers mounted inside the containment. The dissolvers provide a reservoir of boron that mixes with condensate from the upper inner surfaces of the containment vessel when the ECCS is actuated. Limiting Condition effor Operation 3.5.4 is added to ensure that the quantity of boron available for dissolution when the ECCS actuates conforms to the assumptions in the safety analyses. The boron ensures the reactor remains subcritical after certain events in combination with limiting conditions, and subsequent cooldown of the reactor system. The quantity of boron required is specified in the COLR. The ESB satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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**3.3.17 Addition of Limiting Condition effor Operation 3.6.3, Containment Closure**

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Limiting Condition effor Operation 3.6.3 is added to ensure that module inventory is preserved during movement of the module between the operating location and the containment closure tool. The LCO requires a module that is in MODE 4, with the upper module assembly seated on the lower containment vessel flange, be maintained closed. The LCO and allowances are patterned on portions of NUREG-1431, LCO 3.9.4 with extensive modifications to align with the NuScale application. Maintaining containment closure ensures that the decay heat removal mechanism required to assure core cooling is maintained during periods when the module is isolated from other systems such as CVCS and CFDS, with containment

intact. Containment closure must be maintained until the containment is disassembled and the reactor vessel is thermally connected to, ~~or when the containment is disassembled from~~ the UHS via the de-energized ECCS valves. Limiting Condition ~~ef~~for Operation 3.6.3 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii).

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### 3.3.18 Removal of Limiting Condition ~~ef~~for Operation 3.7.3, In-Containment Secondary Piping Leakage

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Limiting Condition ~~ef~~for Operation 3.7.3 is deleted as no longer necessary because the break exclusion design criteria is applied to the secondary system piping within the containment. The DCA design for secondary system piping met the leak-before-break design criteria of General Design Criteria 4.

US460 Standard Design Approval FSAR Section 3.6 describes the application of design measures to prevent or mitigate postulated dynamic effects associated with postulated rupture of US460 piping. The US460 SDA design of secondary piping inside the containment meets the criteria for exclusion from postulated breaks and cracks provided in NRC Branch Technical Position (BTP) 3-4. Based on this change the US600 Design Certification Application LCO is no longer needed because the piping is excluded from consideration of postulated breaks and cracks.

### 3.3.19 Other Bases Changes

In addition to the specific changes described above, Applicable Safety Analyses sections are modified to reflect changes to the safety analyses, primarily as a result of the increased reactor power. Other changes are made in response to operational analysis feedback to clarify and ease understanding of the requirements.

## 3.4 Chapter 4, Design Features

### Section 4.3 Fuel Storage

The fuel storage design description is modified to reflect changes to the design and analyses. Key variables are bracketed to allow replacement with actual plant-specific values when design details are finalized by a future applicant that references the NuScale power plant US460 standard design. NuScale is monitoring industry efforts to relocate fuel storage detailed requirements to a COLR-like document and anticipates adopting this practice when the concept matures.

## 3.5 Chapter 5, Administrative Controls

### Section 5.2.2, Facility Staff

This section is modified to reflect approved topical report TR-0420-69456, "NuScale Control Room Staffing Plan," TR-0420-69456, Revision 1-A.