

Discussion Topics for the March 12, 2019, Public Teleconference with NuScale
Neutron Absorbers ITAAC and COL 9.1-8

- A. ITAAC #1 in FSAR Tier 1, Table 3.5-1 is not applicable. Neutron absorbing material is not an allowed material per ASME Code Section III, NF-2121. Additionally, neutron absorbing material utilized in the fuel rack is not within the scope of ASME Code Section III-NF (see NF-1000).

The acceptance criteria for ITAAC #2 in Table 3.5-1 is:

The as-built fuel storage racks, including any neutron absorbers, and their configuration within the SFP conform to the design values for materials and dimensions and their tolerances, as shown to be acceptable in the approved fuel storage criticality analysis.

A less condensed version of this acceptance criteria is:

“The as-built storage racks and their configuration within the SFP conform to the design values. These design values apply to both the storage rack and the neutron absorber. The design values include: material design values, material dimensions, and material tolerances. The acceptance criteria are provided in the fuel storage criticality analysis.”

The aforementioned material design value is the neutron absorber’s neutron attenuation value. The criticality analysis does not address variability within a lot of material. Part 2 of the new ITAAC addresses this gap. Part 2 of the new ITAAC does overlap with a portion of ITAAC #2 in Table 3.5-1. ITAAC #2 could be revised as follows when the new ITAAC is added:

The as-built fuel storage racks, including any neutron absorbers, and their configuration within the SFP conform to the design values for ~~materials and dimensions~~ and their tolerances, as shown to be acceptable in the approved fuel storage criticality analysis.

ITAAC #2 in Table 3.5-1 does not address the topics of materials qualification or material cleanliness. On page 125 of the fuel storage criticality analysis, NuScale states that the NuScale neutron absorber will not experience irradiation damage, corrosion, blistering, swelling, or delamination. The basis for this statement is the Metamic materials qualification paper “Qualification of METAMIC® for Spent Fuel Storage Application.” NuScale has stated that they do not wish to commit to using Metamic. NuScale has not shown that the Metamic materials qualification results are applicable to the NuScale neutron absorbing material. This gap is addressed by Part 1 of the new ITAAC.

Finally, on page 123 of the fuel storage criticality analysis NuScale states “Other possible failure mechanisms are contamination events or manufacturing defects, which are outside the scope of this evaluation.” This gap is addressed by Part 2 of the new ITAAC.

- B. Clarification on the NRC staff request to include fuel assemblies in the fuel rack COL item 9.1-8