



April 25, 2018

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 Response to NRC Request for Additional Information No. 373 (eRAI No. 9406) on the NuScale Design Certification Application

REFERENCE: U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 373 (eRAI No. 9406)," dated February 28, 2018

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's response to the following RAI Question from NRC eRAI No. 9406:

- 04.02-9

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Steven Mirsky at 240-833-3001 or at smirsky@nuscalepower.com.

Sincerely,

A handwritten signature in black ink, appearing to read "Zackary W. Rad".

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

Distribution: Samuel Lee, NRC, OWFN-8G9A
Prosanta Chowdhury NRC, OWFN-8G9A
Bruce Bavol, NRC, OWFN-8G9A

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9406



Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 9406

Response to Request for Additional Information Docket No. 52-048

eRAI No.: 9406

Date of RAI Issue: 02/28/2018

NRC Question No.: 04.02-9

In Appendices A through D of 10 CFR Part 52, the Commission has approved a two-tiered structure to design certifications. Discussions regarding the two-tiered approach can be found in the final rulemaking and various SECY papers and Staff Requirement Memorandums (SRMs). In particular, in the Staff Request Memorandum (SRM) to SECY-94-084 (ML003708098), the Commission instructed the staff to implement the two-tiered design certification rule structure proposed by the staff. The latest guidance is found in SECY-17-0075 (ML16196A321). SRP Section 14.3.4 provides some general guidance regarding the contents of Tier 1 and specifically states that:

Tier 1 should include those SSCs that could affect the operation of the reactor and core cooling systems [e.g., the following chapters of the Standard Review Plan (SRP): Chapter 4- Reactor, Chapter 5-Reactor Coolant Systems and Connected Systems, Chapter 6-Section 6.3 on Emergency Core Cooling Systems, Chapter 9-9.3.6 on the standby liquid control system, Chapter 15-Transients and Accidents Analyses].

The fuel assembly design is a safety significant structure due to (1) the fuel cladding acting as the first fission product barrier, and (2) the direct safety impacts that the fuel assembly design has on the analyses for normal operation, anticipated operational occurrences (AOOs), and postulated accidents (in particular, Chapter 4 and Chapter 15). Additionally, the empirical nature of the fuel design analysis methods means that the approved safety codes and methods are closely tied to the fuel assembly designs upon which they were built. The safe operation of the reactor and core cooling systems can be directly impacted due to the fuel assembly design having direct impacts on thermal-hydraulic and transient performance. Similarly, the burnup limit is safety significant because it has direct implications on the fuel performance and is an important parameter in the design basis accident radiological consequences analyses.

The staff requests NuScale to provide the Tier 1 description for the fuel system design. For example, the Tier 1 description should include the following (or something equivalent):

Section 1.X.X Fuel Assembly Design

The fuel assembly is designed to ensure that possible fuel damage would not result in the release of radioactive materials in excess of prescribed limits. The fuel assembly is comprised of fuel rods, grids, guide tubes, top and bottom nozzles, plenum springs, and leaf springs. The



fuel assembly design utilized in the NuScale reactor must be approved by the NRC for the NuScale reactor design.

NuScale Response:

NuScale has added a Tier 1 design description section for the fuel assembly design. An associated inspections, tests, analysis, and acceptance criteria (ITAAC) is not required for the new Tier 1 fuel assembly design description in accordance with the guidance in standard review plan (SRP) Section 14.3.4.

Impact on DCA:

Tier 1 has been revised as described in the response above and as shown in the markup provided in this response.

Additional Information:

New Tier 1, Section 2.9 has been added.

RAI 04.02-9

2.9 Fuel Assembly Design**2.9.1 Fuel Assembly Design**System Description

The fuel assembly is designed to ensure that possible fuel damage will not result in the release of radioactive materials during normal operations, anticipated operational occurrences, and postulated accidents, in excess of prescribed limits. The fuel assembly is comprised of fuel rods, spacer grids, guide tubes, top and bottom nozzles, and plenum springs. The fuel assembly design is approved by the NRC for the NuScale reactor design.

2.9.2 Inspections, Tests, Analyses and Acceptance CriteriaNone