UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

July 31, 2023

Ms. Carrie Fosaaen
Vice President, Regulatory Affairs
NuScale Power, LLC
1100 NE Circle Boulevard, Suite 200
Corvallis, OR 97330

SUBJECT: ACCEPTANCE FOR DOCKETING OF THE NUSCALE US460 STANDARD DESIGN APPROVAL APPLICATION (DOCKET NOS. 05200050 and 99902078)

Dear Ms. Fosaaen:

This letter documents the U.S. Nuclear Regulatory Commission (NRC) staff's decision to accept for docketing the NuScale Power, LLC (NuScale) standard design approval application (SDAA) for a US460 Small Modular Reactor. NuScale submitted the SDAA pursuant to the requirements of Title 10 of the *Code of Federal Regulations*, Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." A Notice of Acceptance for docketing of the SDAA will be published in the *Federal Register*.

By letter dated March 17, 2023 (available in the NRC Agencywide Documents Access and Management System (ADAMS) at Accession No. ML23058A160), the staff informed you that your staged SDAA, the last submittal of which was provided on December 31, 2022 (ML22339A066), will be considered tendered but not docketed until NuScale's response to the staff's Request for Supplemental Information (RSI) enclosed in the March 17 letter is submitted and the SDAA is found to be acceptable for detailed technical review by the staff. By letter dated July 14, 2023 (ML23195A092), NuScale submitted its response to the staff's RSI. Additionally, on July 17, 2023 (ML23198A244), NuScale submitted Licensing Topical Report (LTR) TR-131981, "Methodology for the Determination of the Onset of Density Wave Oscillations (DWO)," Revision 1, that incorporated changes resulting from NuScale's RSI response. The NRC staff and NuScale have had substantial and productive engagements over the past few months regarding NuScale's submittals to help ensure an efficient and timely safety review.

In accordance with 10 CFR sections 2.101, 52.136 and 52.137, the NRC staff has completed its acceptance review and has determined that the SDAA, as supplemented by your response to the RSI and the revised DWO LTR, is acceptable for docketing. The docket number established for this application is 05200050. Please note, however, that the staff's determination to accept the application for docketing does not preclude the issuance of requests for additional information, as the staff's review proceeds.

The NRC staff's goal is to conduct an efficient, high-quality safety review applying available insights associated with the agency's risk-informed decision-making principles during its review of the SDAA. The safety review supports issuance of a final safety evaluation report by July 31, 2025 (i.e., 24 months from docketing). This date could change due to several factors, such as the timeframe for resolution of complex technical issues, unanticipated changes to the scope of the review, any supplements to the application, design changes, or other unanticipated factors.

The milestones for the four phases of the review are provided below. The NRC staff will provide resource estimates within 60 days of the issuance of this letter.

| Phase | Phase Name | End date |
|---|---|---|
| Phase A | Advanced Safety Evaluation Report (ASER) without open items (draft completion date; internal NRC schedule) | November 2024 |
| Phase B | ASER review (technical editing), Management concurrence | February 2025 |
| Phase C | ACRS Review of ASER | May 2025 |
| Phase D | Final Safety Evaluation Report and SDA | July 2025 |

The principal factors considered in developing the schedule include the following:

- The assumption that the staff's review of items identified in the staff's March 17, 2023, letter as focus items supporting reliable Schedule Development does not identify new technical issues requiring additional time and resources to complete the safety review. The resolution of these focus items are key elements to maintaining an achievable schedule. The focus items represent information gaps that need to be provided to develop resource estimates and perform the technical review. If timely resolution of a focus item cannot be achieved, the significance of the item will be evaluated and the schedule will be reviewed to ensure that continued efforts associated with established safety review can be accomplished.

- As noted in the NRC staff's March 17, 2023, letter, NuScale had undertaken optimization and streamlining of its application content to include only the information that NuScale believed was necessary for NRC to make its regulatory findings. The staff believes that there are areas where the level of detail in the SDAA is not sufficient to provide the bases for NuScale's stated conclusions. Any delay in providing the needed information can impact the staff's review schedule.

- Four licensing topical reports (TRs) that document the methodologies used to demonstrate the overall safety of the NuScale design were submitted with the SDAA and will be reviewed concurrently with the SDAA. Any delay in completing the review of these licensing TRs can impact the SDAA review schedule.

In addition to the five items identified as High Impact Technical Issues (HITIs) in the NRC staff's March 17, 2023, letter, the staff has identified three new HITIs. As stated in the March 17 letter, HITIs will likely require increased attention by both NuScale and the staff to ensure timely completion of the staff's safety review. The three new topics are:

- Consideration of operational realities, and secondary side controller design, within the DWO licensing TR (related to RSI - 4, 12, 13, in NuScale July 14, 2023, letter).
- Holistic consideration of the impact of DWO and steam generator inlet flow restrictor design changes on design-basis event progression for all transient conditions and validity of codes used for the evaluations (related to RSI - 14, 15, 16, 17 in NuScale July 14, 2023, letter).

- ASME (American Society of Mechanical Engineers) qualification of the helical coil steam generator considering the onset of DWO-induced loads.

It should also be noted that additional HITIs could be identified during the course of the staff's safety review. Furthermore, if during the safety review of HITIs, the staff determines that additional testing is necessary, it will be critical that the timelines and resources for those tests be promptly identified by NuScale so that the staff can re-assess the overall schedule and resource estimates for its review of the SDAA, as appropriate.

Lastly, through the interactions with NuScale during the preceding months, the staff has learned of design changes that have occurred since the staff's completion of the final safety evaluation for the design certification. Among other matters, the thermal power increase included in the US460 design as well as these design changes will be addressed during the staff's review. NuScale will need to provide timely responses (i.e., within 30 days) containing information to address to staff questions related to these design changes and other matters, to ensure that the overall review schedule can be met.

If you have any questions, I can be reached at (301) 415-8013 or by email at Getachew.Tesfaye@ nrc.gov.

Sincerely,

***/RA/***

Getachew Tesfaye, Senior Project Manager
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

Docket No: 05200050

cc: DC NuScale Power LLC Listserv

SUBJECT: ACCEPTANCE FOR DOCKETING OF THE NUSCALE US460 STANDARD DESIGN APPROVAL APPLICATION (DOCKET NOS. 05200050 and 99902078) DATED: JULY 31, 2023

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