December 14, 2022

Andrea Veil
Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001

SUBJECT: Request for 10 CFR 50.55a Code Alternative: American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) Section III, Code Case N-883

REFERENCES:
1. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 2017 edition, Section III, Subsection NCA, "General Requirements for Division 1 and Division 2."

2. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 2021 edition, "Code Cases: Boilers and Pressure Vessels," Supplement 5.

3. U.S. Nuclear Regulatory Commission, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III Regulatory Guide 1.84, Revision 39, December 2021.

NuScale Power, LLC (NuScale) hereby requests that the NRC grant authorization for NuScale to implement an alternative to certain provisions of ASME BPVC, Section III (Reference 1). Pursuant to 10 CFR 50.55a, certain systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPVC. Various provisions of ASME Section III effectively preclude NuScale from "constructing" ASME Code items prior to the docketing of a construction permit or combined license application. Early construction of Code items (which includes certain design activities) is essential for NuScale to produce and deliver its highly standardized, small modular reactor design in accordance with customer needs. Recent ASME Code Case N-883 (Reference 2) would have resolved this impediment to NuScale beginning Code construction activities. However, while NRC Staff endorsed N-883 (Reference 3), the accompanying conditions prohibit NuScale from using it.

Accordingly, pursuant to 10 CFR 50.55a(z), NuScale requests to implement ASME's Code Case N-883 as an alternative to the provisions of BPVC Section III.

If you have any questions, please contact me at 541-360-0740 or at tbergman@nuscalepower.com.

Sincerely,

Tom Bergman
Vice President, Regulatory Affairs
NuScale Power, LLC

Enclosure

ASME BPVC Code Alternative Request: Code Case N-883 for Construction of ASME Code Items

1.0 Code Components Affected

This request affects various components of the NuScale Power Module (NPM) undergoing design pursuant to ASME BPVC Section III. No component subject to this request has yet been constructed.

2.0 Applicable Code Edition, Addenda, and Code Requirement

The NPM is designed in accordance with the 2017 edition of ASME BPVC, Section III. The provisions of Subsection NCA (Reference 1), Article NCA-3000 define responsibilities of the Certificate Holder and Owner.

ASME Code Case N-883 (Reference 2) addresses the conditions under which Certificate Holders may construct items prior to the establishment of an Owner, and an Owner's subsequent use of such items in their facility.

3.0 Alternative Request

3.1 Reason for request

Pursuant to 10 CFR 50.55a(c), (d), and (e), systems and components of pressurized and boiling water-cooled nuclear power reactors must meet the requirements of the ASME BPV Code as specified in that paragraph. Each standard design approval, design certification, and combined license for a utilization facility is subject to the condition that certain components meet the requirements of ASME BPVC Section III.

NuScale is the applicant for the "Design Certification Rule for NuScale" (Reference 4). NuScale has also begun submitting its application for standard design approval of the NuScale US460 standard plant design (Reference 5). As such, NuScale is an "applicant" subject to the required codes and standards of 10 CFR 50.55a and eligible to seek a Code alternative pursuant to 10 CFR 50.55(z).

NuScale seeks to "construct" certain items subject to ASME BPVC Section III ("Code items") without a designated "Owner" as defined by Section III. "Construction" is defined by Section III to include materials, design, fabrication, and other activities. The items NuScale seeks to construct include, for example, long-lead components for which it is necessary to complete design specifications and begin fabricating in order to support the timely deployment model of the modular NuScale Power Plant.

In addition to seeking NRC design approval for the NuScale Power Plant, NuScale is an ASME N Certificate Holder. Various provisions of ASME Section III effectively preclude a Certificate Holder constructing Code items without a specified "Owner" of the facility for which those items are intended. For example, under Paragraph NCA-3251, "it is the responsibility of the Owner to provide, or cause to be provided, Design Specifications for components, supports, and appurtenances." The N Certificate Holder "has the responsibility for the structural integrity using the Design Specification" provided by the Owner (NCA-3540). Therefore, without an Owner to provide Design Specifications, NuScale, as N Certificate Holder, cannot complete design specifications and begin fabricating Code items.

In Code Case N-883, ASME addressed the issue at hand: "Under what conditions may Certificate Holders construct items prior to the establishment of an Owner, and under what conditions may Owners

utilize these items in their facility?" The Committee determined in N-883 that it was allowable for Certificate Holders to construct items prior to the establishment of an Owner, and that Owners may utilize such items, subject to a series of conditions. The basic rule is that the Certificate Holder prepares and certifies a Design Specification to govern construction of the item. Following designation of an Owner for the item and prior to installation in the Owner's facility, the Owner, or their designee, reconciles the Design Specification with their own, or adopts the Design Specification as a basis for construction.

Code Case N-883 would therefore allow NuScale to begin construction of Code items as desired. However, pursuant to 10 CFR 50.55a(a)(3)(i), the use of ASME Code Cases is acceptable only with the conditions specified in the listed regulatory guides (RGs). RG 1.84, Revision 39 (Reference 3), approves N-883 with the condition that it "may only be used for the construction of items by a holder of a construction permit, operating license, or combined license under 10 CFR Part 50 or Part 52. This Code Case may not be used by a holder of a manufacturing license or standard design approval or by a design certification applicant." Therefore, RG 1.84 currently prohibits NuScale's use of Code Case N-883.

This relief request seeks NRC authorization for NuScale, as a design certification and standard design approval applicant, to utilize Code Case N-883 and thereby begin constructing Code items pursuant to the terms of Code Case N-883.

3.2 Proposed alternative

As an alternative to ASME Section III Subsection NCA, as applicable to NuScale via 10 CFR 50.55a(c), (d), and (e), NuScale proposes to follow Code Case N-883. If this request is granted, NuScale would be authorized to construct Code items without a designated Owner of those Code items; future Owners could utilize those Code items in NRC-licensed facilities pursuant to the provisions of Case N-883.

3.3 Basis for request

Pursuant to 10 CFR 50.55a(z), the Director Office of Nuclear Reactor Regulation, may authorize alternatives to the requirements of 10 CFR 50.55a(b) through (j) where an "applicant" demonstrates (1) an acceptable level of quality and safety, or (2) hardship without a compensating increase in quality and safety. NuScale, as applicant for design certification and standard design approval subject to those requirements, seeks to implement Code Case N-883 as an alternative to certain provisions of ASME Section III, Subsection NCA that are required by 10 CFR 50.55a.

3.3.1 The proposed alternative would provide an acceptable level of quality and safety.

The stated basis for RG 1.84's condition on Code Case N-883 is that "without the designation of an Owner, the NRC would not be able to provide regulatory oversight of the ASME certificate holder manufacturing the items, which is not consistent with appendix B to 10 CFR part 50 and the requirements in § 50.55(a) for a basic component," and the condition "provides this specific regulatory authorization thereby ensuring the appropriate regulatory oversight."

Adequate regulatory oversight is ensured under the proposed alternative (NuScale's use of N-883). NuScale's quality assurance program description (QAPD) has been approved by the NRC for use in design certification application related activities (Reference 6); NuScale's QAPD covering US460 standard design approval-related activates has been submitted to the NRC for review (Reference 7). The QAPD describes the methods and established quality assurance and administrative control requirements to satisfy 10 CFR Part 50 Appendix B, 10 CFR part 52, and 10 CFR part 21. NRC has previously inspected and has the ability to further inspect NuScale's implementation of the QAPD, thereby assuring regulatory oversight of NuScale as an applicant and ASME Certificate Holder that will subcontract fabrication and installation to appropriate Certificate Holders. NRC has demonstrated the ability to oversee QAPD implementation by NuScale and NuScale's suppliers (e.g., Reference 8).

Moreover, ASME Section III provides for rigorous quality assurance throughout construction. NuScale, as an N Certificate Holder, must comply with ASME Section III's quality assurance requirements as set forth in NCA-4000.

Code Case N-883 does not permit placing an ASME component into service in a nuclear facility without first identifying an Owner and performing a full reconciliation of the lifetime quality records with the Owner, in accordance with the ASME Code and NRC's regulatory requirements. Since an Owner will be licensed under 10 CFR Part 50 or 52, and thus is subject to 10 CFR 50 Appendix B and construction inspection, NRC will be able to conduct full regulatory oversight of the reconciliation performed by the process. At that point NRC will be able to further inspect NuScale's QA program and verify that the fabricated components were produced in accordance with it, consistent with the intent of Appendix B and the requirements in 10 CFR 50.55a for a basic component. Additionally, 10 CFR Part 21 assures that any defects and noncompliances subsequently discovered by NuScale for a basic component are identified and corrected.

Under the proposed alternative, NuScale will procure Code items utilizing approved and inspected implementing procedures which meet applicable regulatory requirements, subject to NRC inspection of NuScale's performance under its approved QAPD. An Owner's acceptance of constructed Code items will occur under oversight of NRC's construction inspection program to ensure that the Owner's reconciliation is performed in accordance with Code requirements. Therefore, the quality and design provisions of ASME Section III, subject to regulatory oversight by NRC, ensure an acceptable level of quality and safety for items constructed by NuScale under Case N-883.

3.3.2 Compliance with the specified requirements of 10 CFR 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

10 CFR 50.55a, via imposition of ASME Section III Subsection NCA without the availability of Code Case N-883 for NuScale, results in hardship for NuScale without a compensating increase in the level of quality and safety. The purpose of Code Case N-883 is to allow an ASME Certificate Holder to construct items prior to identifying an Owner. Use of the Code Case is essential to NuScale's business plans in developing a highly standardized, small modular reactor design. The supply chain supporting the deployment of the NuScale design demands the construction of standardized components in advance of identifying a specific Owner. NuScale's use of Code Case N-883 will allow NuScale to commence with procurement of various Code items, including those with long lead times that are needed to start fabrication of various components, ensuring continuity in production capabilities. Therefore, the current prohibition on NuScale's use of Code Case N-883 creates a substantial hardship.

Compliance with the specified requirements, which prohibit NuScale's use of Code Case N-883, does not yield a compensating increase in the level of quality and safety. As discussed above, with use of the Code Case adequate quality assurance and oversight will be provided to ensure a level of quality intended by ASME Section III and 10 CFR 50 Appendix B.

Prohibiting NuScale's use of Code Case N-883 does not increase the level of quality assurance oversight otherwise afforded under ASME Section III, because Section III does not prohibit an Owner from having items constructed prior to submitting an application for or receiving a construction permit or operating license. Per NCA-9200, an Owner is the organization legally responsible for the construction or operation of a nuclear facility, "including but not limited to one who has applied for, or has been granted, a construction permit or operating license" [emphasis added]. The Owner must obtain an Owner's certificate after their application is docketed with the NRC, and field installation can only occur after that Owner's certificate is received (NCA-3230). Therefore, an entity responsible for constructing a nuclear facility is able under Section III to have constructed—prior to submitting a COLA and prior to coming under NRC

oversight—Code items that will later be installed at their facility.[1] NuScale's use of Code Case N-883 puts NuScale on similar footing as an Owner prior to licensing except NuScale, as a Certificate Holder, is subject to the quality assurance provisions discussed in the preceding section.

NuScale's use of Code Case N-883 is consistent with other NRC regulations. 10 CFR 50.10 allows for procurement or fabrication of components of a proposed facility occurring at other than the final, in-place location at the facility without a construction permit or license (10 CFR 50.10(a)(1)(viii)). The provisions of Subsection NCA, applied via 10 CFR 50.55a, function to bar for NuScale activities that NRC expressly considered and determined were otherwise allowable without NRC authorization. Prohibiting NuScale's use of Code Case N-883 thus creates an undue hardship for NuScale.

3.4 Duration of Proposed Alternative

NuScale requests use of the proposed alternative indefinitely.

4.0 References

1. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 2017 edition, Section III, Subsection NCA, "General Requirements for Division 1 and Division 2."

2. American Society of Mechanical Engineers, Boiler and Pressure Vessel Code, 2021 edition, "Code Cases: Boilers and Pressure Vessels," Supplement 5.

3. U.S. Nuclear Regulatory Commission, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III Regulatory Guide 1.84, Revision 39, December 2021.

4. NuScale Power, LLC, NuScale Standard Plant Design Certification Application, Rev. 5, July, 29, 2020.

5. NuScale Power, LLC, "NuScale Power, LLC Submittal of the NuScale Standard Design Approval Application Part 2 – Final Safety Analysis Report, Chapter 8, "Electric Power," Revision 0," LO-130758, Nov. 29, 2022.

6. NuScale Power, LLC, "NuScale Topical Report: Quality Assurance Program Description for the NuScale Power Plant," NP-TR-1010-85- NP-A, Revision 5.

7. NuScale Power, LLC, "NuScale Power, LLC Submittal of Topical Report "NuScale Power, LLC Quality Assurance Program Description," MN-122626, Revision 0," LO-126568, Nov. 4, 2022.

8. U.S. Nuclear Regulatory Commission, "U.S. Nuclear Regulatory Commission Vendor Inspection of NuScale Power, LLC, Report No. 05200048/2019-203," July 18, 2019.

9. American Society of Mechanical Engineers, "ASME BPVC, Section III, NCA-3211.26 (2021 Edition) Owner's Designee," Record 21-2242, Dec. 20, 2021.

[1] Compare NCA-3230 (2017 edition) with NCA-3211.4(a) (2021 edition). While the latter is not yet incorporated into 10 CFR 50.55a, it includes substantially the same provision regarding an Owner's certificate. In Reference 9, ASME stated that NCA-3211.4(a) (2021) only prohibits field installation—and not other Code activities—"prior to an Owner obtaining an Owner's Certificate."