

Response to SDAA Audit Question

Question Number: A-5.2.1.1-4

Receipt Date: 04/24/2023

Question:

Please clarify what is intended by the reference to 10 CFR 50.55a(a)(3) in the discussion of use of an ASME OM Code edition or addenda dated later than ASME OM-2017.

Response:

NuScale removed regulatory requirements text in Standard Design Approval Application Chapter 5.2.1.1, which removed the statement in question as shown in the attached markup to Section 5.2.1.1.

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

The RPV, described in Section 5.3, Reactor Vessel, is the primary component of the RCS and RCPB in the NPM. Section 3.9, Mechanical Systems and Components, describes the design transients, loading combinations, stress limits, and evaluation methods used in the design and fatigue analyses of RCPB components, and design information used to support the conclusion that the RCPB integrity is maintained. Design, construction, and maintenance, commensurate with quality standards, of the components of the RCPB ensure overpressure protection of the RCS.

The RCPB includes the RCS injection and discharge piping that interfaces with the CVCS up to the outermost CIV installed on the top of each NPM. A summary discussion of the containment system, including a discussion of the applicability of General Design Criteria (GDC) 55 and 57 to the RCPB, is in Section 6.2.4.

5.2.1 Compliance with Codes and Code Cases

5.2.1.1 Compliance with 10 CFR 50.55a

The NPM meets the relevant requirements of the following regulations.

- 10 CFR 50.55a. Design, fabrication, construction, testing, and inspection of the RPV and pressure retaining components associated with the RCPB are Class 1 in accordance with Section III of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) (Reference 5.2-8) and meet the applicable conditions promulgated in 10 CFR 50.55a(b).
- 10 CFR 50, Appendix A, GDC 1 and GDC 30. Design, fabrication, and testing of the RPV and pressure retaining components associated with the RCPB are Class 1 and meet the highest quality standards in accordance with the Quality Assurance Program described in Chapter 17, Quality Assurance and Reliability Assurance.

The RCS injection and discharge piping that connects to the CVCS up to and including the associated isolation valves is Class 1 in accordance with the ASME BPVC Section III. The RCS piping interfacing with the CVCS from the outermost CIVs to the NPM flange connections is not part of the RCPB and is Class 3 in accordance with ASME BPVC Section III. Systems other than the CVCS that connect to the RCS require isolation and are not classified as part of the RCPB. A listing of the RCPB pressure retaining components and the quality group classification is in Table 3.2-2.

Audit Question A-5.2.1.1-3, Audit Question A-5.2.1.1-4

The ASME BPVC of record for the US460 standard design for the NPM is the ASME BPVC, 2017 Edition. ~~The 2017 Edition of the ASME BPVC, as endorsed by the ASME and promulgated in the 2020 rulemaking proposing to amend 10 CFR 50.55a (85 FR 26576), meets the requirements of ASME BPVC editions specified in 10 CFR 50.55a(a)(1) and Regulatory Guides (RGs) 1.84 and 1.147.~~

The application of the ASME BPVC Section XI inservice inspection (ISI) requirements for Quality Group A systems and components (ASME BPVC Class 1) are in Section 5.2.4, RCPB Inservice Inspection and Testing. The RCPB

does not include Quality Group B or C components. The ASME BPVC Section XI ISI requirements for Quality Groups B and C systems and components (ASME BPVC Class 2 and 3) are in Section 6.6, ISI and Testing of Class 2 and 3 Systems and Components.

Audit Question A-5.2.1.1-4

Operational and maintenance inservice testing codes, standards, and guides for the NPM design are in accordance with the ASME Operation and Maintenance (OM) Code OM-2017, "Operation and Maintenance of Nuclear Power Plants," ~~as allowed by 10 CFR 50.55a(a)(1). ASME OM 2017, as endorsed by the ASME and promulgated in the 2020 rulemaking proposing to amend 10 CFR 50.55a (85 FR 26540), meets the requirements of ASME OM Code editions specified in 10 CFR 50.55a(a)(1) and RG 1.192. Use of an ASME OM Code edition or addenda dated later than ASME OM 2017 edition requires approval for incorporation by reference per 10 CFR 50.55a(a)(1) or authorization by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(a)(3) and subject to applicable provisions of 10 CFR 50.55a(b). An ASME OM Code edition or addenda not endorsed by the NRC may be used pursuant to the requirements of 10 CFR 50.55a(z).~~

Audit Question A-5.2.1.1-3

Section 3.9.6 ~~Section 3.9, Mechanical Systems and Components,~~ describes the Inservice Test (IST) Program and compliance with 10 CFR 50.55a(f)(3)(iii)(B) and 10 CFR 50.55a(f)(3)(iv)(B).

5.2.1.2 Compliance with Applicable Code Cases

ASME BPVC Section III code cases chosen for design, fabrication, and construction are from those listed in the applicable ASME BPVC Edition specified in 10 CFR 50.55a(a)(1)(i) or Tables 1 and 2 of RG 1.84 pursuant to 10 CFR 50.55a(a)(3)(i) and subject to the applicable provisions of 10 CFR 50.55a(b). Code cases used and listed in Table 2 of RG 1.84 also meet the conditions established in the RG.

Section 5.2.4, RCPB Inservice Inspection and Testing, and Section 6.6, Inservice Inspection and Testing of Class 2 and 3 Systems and Components, provide a summary discussion of preservice and ISI examinations and procedures. The ASME BPVC Section XI code cases used for preservice inspection and ISI listed in the applicable ASME BPVC Edition specified in 10 CFR 50.55a(a)(1)(ii) or Tables 1 and 2 of RG 1.147 pursuant to 10 CFR 50.55a(a)(3)(ii) and subject to the applicable provisions of 10 CFR 50.55a(b) are identified. Code cases used and listed in Table 2 of RG 1.147 also meet the conditions established in the RG.

The ASME OM code cases used for preservice testing and inservice testing from those listed in the applicable ASME OM Code Edition specified in 10 CFR 50.55a(a)(1)(iv) or Tables 1 and 2 of RG 1.192 pursuant to 10 CFR 50.55a(a)(3)(iii) and subject to the applicable provisions of 10 CFR 50.55a(b) are identified. Code cases used and listed in Table 2 of RG 1.192 also meet the conditions established in the RG.