

U.S. NUCLEAR REGULATORY COMMISSION SUMMARY OF THE NOVEMBER 17, 2022,
OBSERVATION PUBLIC MEETING
WITH NUSCALE POWER, LLC
TO DISCUSS EMERGENCY CORE COOLING SYSTEM VALVE DESIGN AND TESTING

Summary of Open Session

On November 17, 2022, the U.S. Nuclear Regulatory Commission (NRC) staff conducted a virtual observation public teleconference meeting with NuScale Power, LLC (NuScale), to discuss NuScale's Standard Design Approval Application (SDAA) emergency core cooling system (ECCS) valve design and testing.

The public meeting notice dated November 14, 2022, was posted on the NRC public Web site and can be found in the NRC's Agencywide Documents Access and Management Systems (ADAMS) under Accession No. ML22318A191. Information related to NuScale presentation can be found under ML22313A118.

The public meeting commenced with opening remarks and an introduction of participants as well as an external stakeholder.

NuScale stated that the objective of the meeting is to address the NRC staff comments from the SDAA Chapter 3, Readiness Assessment. Those comments centered around the ECCS valve design changes, and the need to design, revise or supplement the relief/alternative requests in the SDAA to address the implementation of the 2017 Edition of the American Society of Mechanical Engineers (ASME) Operation and Maintenance Code (OM Code) of Nuclear Power Plants, Division 1. NuScale's presentation was centered on reaching common understanding of the ECCS valve design and the changes proposed to reflect changes between the ASME OM Code, 2012 and 2017 Editions.

NuScale explained that the ECCS fundamentally operated the same in the design certification application (DCA) and standard design approval (SDA) designs; when the ECCS actuates, the reactor vent valves (RVVs) open to vent steam to the containment environment, the steam condenses on the containment vessel walls, which transfers heat to the reactor pool, which is the ultimate heat sink, and then the reactor recirculation valves (RRVs) allow that condensate to return the reactor vessel, providing a two-phase natural circulation loop to cool the reactor core.

NuScale explained that one of the most challenging events in the NuScale DCA was the postulated inadvertent opening of an ECCS RVV, which would result in rapid cooling which challenges the critical heat flux (CHF) margin of fuel bundles in the core, so changes were made between the DCA and SDA designs to slow the transient to improve the response to a loss-of-coolant accident (LOCA) while maintaining sufficient capacity for long term cooling.

NuScale pointed out that, in the DCA, they were required to implement the ASME OM Code, 2012 Edition. NuScale's desire was to apply Appendix IV, "Preservice and Inservice

Testing of Active Pneumatically Operated Valve Assemblies in Nuclear Reactor Power Plants,” in the 2017 Edition of the ASME OM Code for air-operated valves (AOVs) and hydraulic-operated valves (HOVs) in the NuScale design. NuScale’s containment isolation valves (CIVs), Decay Heat Removal System (DHRS) valves, and ECCS valves are HOVs. NuScale stated they obtained authorization from the NRC to apply Appendix IV under 10 CFR 50.55a(z) as an alternative to the ASME OM Code (2012 Edition) requirements. For the NuScale SDA, NuScale is required to implement the 2017 Edition of the ASME OM Code for AOVs in the NuScale design. NuScale explained that NuScale plans to submit a 10 CFR 50.55a(z) alternative request to implement Appendix IV for the HOVs in the NuScale design. NuScale also discussed the overall impacts of the changes resulting from the in-service testing (IST) program update from the 2012 Edition of the ASME OM Code to the 2017 Edition. For example, the scope of the augmented IST program will be adjusted. Further, two new alternate authorizations will be needed regarding the HOVs and ECCS valves in the NuScale SDA design.

NRC staff stated their appreciation of NuScale’s identification of the required alternatives to be able to use Appendix IV for HOVs and ECCS valves because they are within the scope of Subsection ISTC in the 2017 Edition of the ASME OM Code. NRC staff noted that there is a condition in 10 CFR 50.55a for new reactors regarding periodic verification of the design-basis capability of power-operated valves in 10 CFR 50.55a(b)(3)(iii)(A). The NRC staff recommended that NuScale address this regulatory requirement in the SDA submittal. The staff added that the regulations in 10 CFR 50.55a(f) require that combined license (COL) licensees must use the latest Code edition incorporated by reference 18 months before fuel load. However, the NRC staff issued Regulatory Issue Summary 2012-08, Revision 1, “Developing Inservice Testing and Inservice Inspection Programs Under 10 CFR Part 52,” discussing how a COL applicant may request to use the edition of the OM Code that was specified in the original application.

The public was provided an opportunity to provide comments and ask questions, to which there were none.

The public session of the meeting concluded at 11:25 a.m. The NRC staff continued discussion with NuScale during a closed meeting to discuss proprietary information related to the topic.