



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

November 30, 2022

MEMORANDUM TO: Michael I. Dudek, Chief
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

FROM: David Drucker, Senior Project Manager */RA/*
New Reactor Licensing Branch
Division of New and Renewed Licenses
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE OCTOBER 25, 2022, OPEN MEETING, TO
DISCUSS THE NUSCALE US460 STANDARD DESIGN
APPROVAL AIR-COOLED CONDENSER

The U.S. Nuclear Regulatory Commission held an observation public meeting on October 25, 2022, to receive an overview from NuScale Power, LLC (NuScale) on the air-cooled condenser to be used in the US460 Standard Design Approval application that they plan to submit later this calendar year. The NuScale submitted meeting materials can be found at ML22291A471. There was not a closed portion of this meeting.

Enclosed is the meeting agenda (Enclosure 1), list of participants (Enclosure 2), and meeting summary (Enclosure 3).

Docket No. 99902078

Enclosures:

1. Meeting Agenda
2. List of Attendees
3. Meeting Overview

CONTACT: David Drucker, NRR/DNRL
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SUBJECT: SUMMARY OF THE OCTOBER 25, 2022, OPEN MEETING, TO DISCUSS THE
 NUSCALE US460 STANDARD DESIGN APPROVAL AIR-COOLED CONDENSER
 DATED: NOVEMBER 30, 2022

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ADAMS Accession No.: ML22332A518***via email****NRR-106**

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U.S. NUCLEAR REGULATORY COMMISSION

**SUMMARY OF THE OCTOBER 25, 2022, OPEN MEETING, TO DISCUSS NUSCALE US460
STANDARD DESIGN APPROVAL AIR-COOLED CONDENSER**

MEETING AGENDA

Time	Topic	Speaker
2:00 pm	Introductions	NRC and NuScale
2:05 pm	Discussion of US460 Standard Design Approval Air-Cooled Condenser	NuScale
2:45 pm	Opportunity for Public Comment	Public
3:00 pm	Adjourn	NRC

U.S. NUCLEAR REGULATORY COMMISSION

**SUMMARY OF THE OCTOBER 25, 2022, OPEN MEETING, TO DISCUSS NUSCALE US460
STANDARD DESIGN APPROVAL AIR-COOLED CONDENSER**

MEETING ATTENDEES

Name	Organization
Brian Smith	U.S. Nuclear Regulatory Commission (NRC)
Mike Dudek	NRC
Getachew Tesfaye	NRC
Bruce Bavol	NRC
Alina Schiller	NRC
David Drucker	NRC
Ricky Vivanco	NRC
Stacy Joseph	NRC
Jordan Glisan	NRC
Angelo Stubbs	NRC
Ryan Nolan	NRC
Antonio Barrett	NRC
Nageswara Karipineni	NRC
Kamal Manoly	NRC
Mark Shaver	NuScale Power, LLC (NuScale)
Liz English	NuScale
Sam D'Amico	NuScale
Jim Osborn	NuScale
Wendy Reid	NuScale
Austin Cocke	NuScale
Susan Baughn	NuScale
Robert Gamble	NuScale
Barry Reichelderfer	NuScale
Fehmida Mesania	NuScale
Rani Franovich	The Breakthrough Institute
Sarah Fields	Uranium Watch

U.S. NUCLEAR REGULATORY COMMISSION

SUMMARY OF THE OCTOBER 25, 2022, OPEN MEETING, TO DISCUSS NUSCALE US460 STANDARD DESIGN APPROVAL AIR-COOLED CONDENSER

On October 25, 2022, the U.S. Nuclear Regulatory Commission (NRC) held an observation public meeting to receive an overview from NuScale Power, LLC (NuScale) on design and safety information of the Air Cooled Condenser System (ACCS) and Condenser Air Removal System (CARS); a subsystem of the ACCS they plan to use in their US460 Standard Design Approval application that they plan to submit later this calendar year.

The meeting began with attendees introducing themselves and David Drucker, NRC Sr. Project Manager stating the purpose of the meeting and discussing the meeting agenda. Next, NuScale representatives Sam D'Amico, Barry Reichelderfer and Austin Cocke presented the information contained in the slides found at Agencywide Documents Access and Management System Accession No. [ML22291A471](#). This information included:

- (1) ACCS and CARS are not Safety-Related Systems
 - a. The ACCS and CARS serve no safety-related functions, are not risk significant, are not credited for mitigation of a design basis accident, and have no safe shutdown functions
 - b. The ACCS and CARS are Quality Group D and Seismic Category III
 - c. The CARS subsystem has a nonsafety-related with augmented requirements (NSAR) function to provide post-accident instrumentation to monitor variables such as radioactivity monitoring

- (2) Why use Air Cooled Condensers?
 - a. Water is becoming a scarce/expensive resource
 - b. Some customers will not have water access
 - c. ACCS in the SDAA establishes a baseline moving forward

- (3) NuScale's Decision to Choose ACCs
 - a. Secondary systems are nonsafety-related, not risk-significant
 - b. Extensive vendor engagement with multiple vendors who provided efficiency and backpressure information to inform turbine generator design
 - c. Not a significant cost difference between wet and dry cooling
 - d. ACCs are a proven technology
 - e. Introduced to and engaged with the ACC Users Group

NRC staff asked if there is a common problem with using ACCs? NuScale responded that a common problem outside the nuclear industry when using ACCs is flow accelerated corrosion (FAC) which is probably due to little chemistry control. NuScale stated they did not expect FAC to impact their use of ACCs because of significantly greater chemistry control in nuclear industry applications.

- (1) Air Cooled Condenser System - principal functions:
 - a. Condense exhaust steam from the turbine exhaust
 - b. Reduce dissolved oxygen (DO) level in the feedwater

- c. Maintain ACC vacuum condition by removing air and noncondensibles from the main condenser
- d. Provide adequate capacity for condensate and feedwater system during normal operation

NRC staff asked if there is a concern with interference between and among the various fans of the ACCS? NuScale responded that there is no expected concern with interference between and among the fans and that the elevated location of the fans helps avoid interference.

(1) Radiation Monitors:

- e. Radiation monitoring is provided for the liquid ring vacuum pump and steam jet air ejector gaseous effluent and at the common exhaust header that collects and releases gaseous effluent to the atmosphere
- f. Provide early indication of primary-to-secondary leakage radiation and alarms in the main control room to enable operators to shut down and isolate leaks
- g. Integrated sampling skids provide provisions for representative grab samples

(2) ACCS Regulatory Compliance:

- a. General Design Criteria (GDC) 60 - Control of releases of radioactive materials to the environment
- b. GDC 64 - Monitoring radioactivity releases
- c. 10 CFR 52.47(b)(1) - A Design Certification application contains the proposed inspections, tests, analyses, and acceptance criteria (ITAAC)
 - i. Not required for the SDAA but the NuScale Final Safety Analysis Report addresses ITAAC

(3) CARS Regulatory Compliance:

- a. GDC 2 - Design bases for protection against natural phenomena
- b. GDC 3 - Fire protection
- c. GDC 4 - Environmental and dynamic effects design bases
- d. GDC 5 - Sharing of structures, systems, and components
- e. GDC 60 - Control of releases of radioactive materials to the environment
- f. GDC 64 - Monitoring radioactivity releases
- g. 10 CFR 20.1406 - minimization of contamination of the facility
- h. Regulatory Guide 1.29 - not located in areas that contain safety-related components and is not required to operate during or after an accident. The CARS is Seismic Category III.

NRC staff asked why 10 CFR 20.1406 is applied to the CARS but not the ACCS? NuScale responded that they followed the guidance in the SRP (NUREG-0800) and NRC staff said they understood.

NRC staff asked how NuScale will address steam leakage in the SDAA. NuScale responded that the system will monitor for radiation and a loss of vacuum and isolate a potential leak.

NRC staff asked if NuScale knew if ACCs had been used in nuclear plants and NuScale responded that they are certain ACCs have not been used in U.S. nuclear plants and are not aware of any use of ACCs in nuclear plants outside the U.S.

NRC staff asked if the NuScale design will address missiles caused by high winds? NuScale responded that none of the ACCS equipment performs a safety-related function so they have

not done any missile analysis for the ACCS. NuScale has done missile analysis on safety-related equipment for this design. NRC staff raised a concern with parts of the ACCS becoming missiles. NuScale stated the ACCS would be built structurally sound to reduce the chance of ACCS parts becoming missiles.

NRC staff asked if NuScale considered turbine trips due to high back pressure? NuScale responded that they did consider turbine trips from high back pressure to include the ability to have 100% of capacity bypass the turbine.

NRC staff asked if the design can be operated in the island mode and NuScale responded that they did not have the correct staff on this call to address that question.

NRC staff asked how the ACCS responds when a given ACCS fan stops operating? NuScale responded that they did not have the correct staff on this call to address that question.

NRC staff asked what level of detail will be in the drawings provided with the SDAA? NuScale responded that the level of detail in slide 20 of this briefing is representative of the level of detail in the SDAA?

Sarah Fields, Uranium Watch, asked what the water needs for the NuScale design. NRC staff responded that we require a 7-day supply of water on-hand. S. Fields asked if there is a 7-day supply of water on-hand would an external water supply be needed. NRC staff stated that there is typically significantly more water on-site beyond the 7-day supply.

The meeting began at 2:00 pm and concluded at 2:54 pm eastern standard time.