October 13, 2021 Docket No. 99902078

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Submittal of Presentation Materials, "SDA Pre-Application Presentation: NuScale SDA Density Wave Oscillation Carve-out Resolution Plan (Open Session)," PM-107891, Revision 0

NuScale Power, LLC (NuScale) has requested a meeting with the NRC technical staff on October 19, 2021, to discuss the density wave oscillation carve-out. The purpose of this submittal is to provide presentation materials to the NRC for use during this meeting.

The enclosure to this letter is the nonproprietary presentation entitled "SDA Pre-Application Presentation: NuScale SDA Density Wave Oscillation Carve-out Resolution Plan (Open Session)."

This letter makes no regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions, please contact Liz English at 541-452-7333 or at eenglish@nuscalepower.com.

Sincerely,

Mark W. Shaver

Mark W. Shaver
Manager, Licensing
NuScale Power, LLC

Distribution: Michael Dudek, NRC
Getachew Tesfaye, NRC
Bruce Bavol, NRC

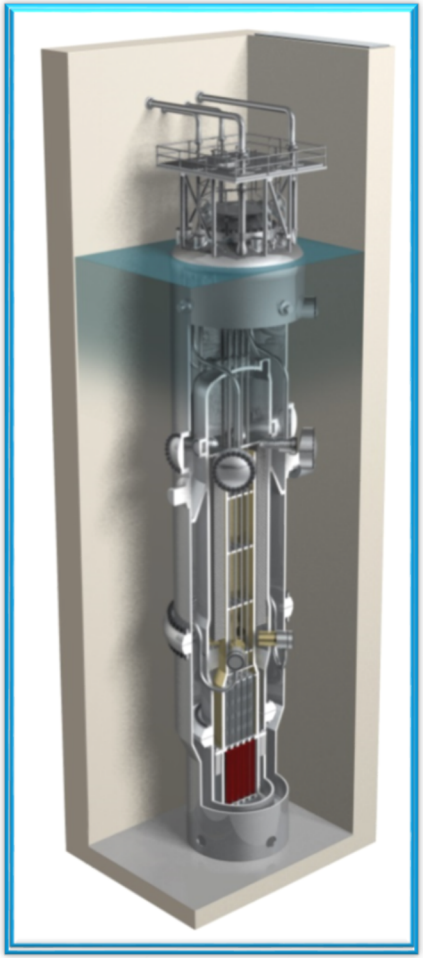
Enclosure: "SDA Pre-Application Presentation: NuScale SDA Density Wave Oscillation Carve-out Resolution Plan (Open Session)," PM-107891, Revision 0

Enclosure:

"SDA Pre-Application Presentation: NuScale SDA Density Wave Oscillation Carve-out Resolution Plan (Open Session)," PM-107891, Revision 0

NuScale Power, LLC
1100 NE Circle Blvd., Suite 200 Corvallis, Oregon 97330 Office 541.360-0500 Fax 541.207.3928
www.nuscalepower.com

SDA Pre-Application Presentation



NuScale SDA Density Wave Oscillation Carve-out Resolution Plan

(Open Session)

October 19, 2021

PM-107891
Revision: 0

Template #: 0000-21727-F01 R7

Presenters

Mark Shaver
Manager, Licensing

Bob Houser
Manager, Testing and Code Development

John Fields
Licensing Engineer

Agenda

- Purpose
- Background
  - Comments During DCA Review
  - DCA Outcome
- NRC Engagement

Purpose

Present the NuScale plan to address the DCA DWO carve-out

Demonstrate a connection between DCA review comments and the NuScale plan

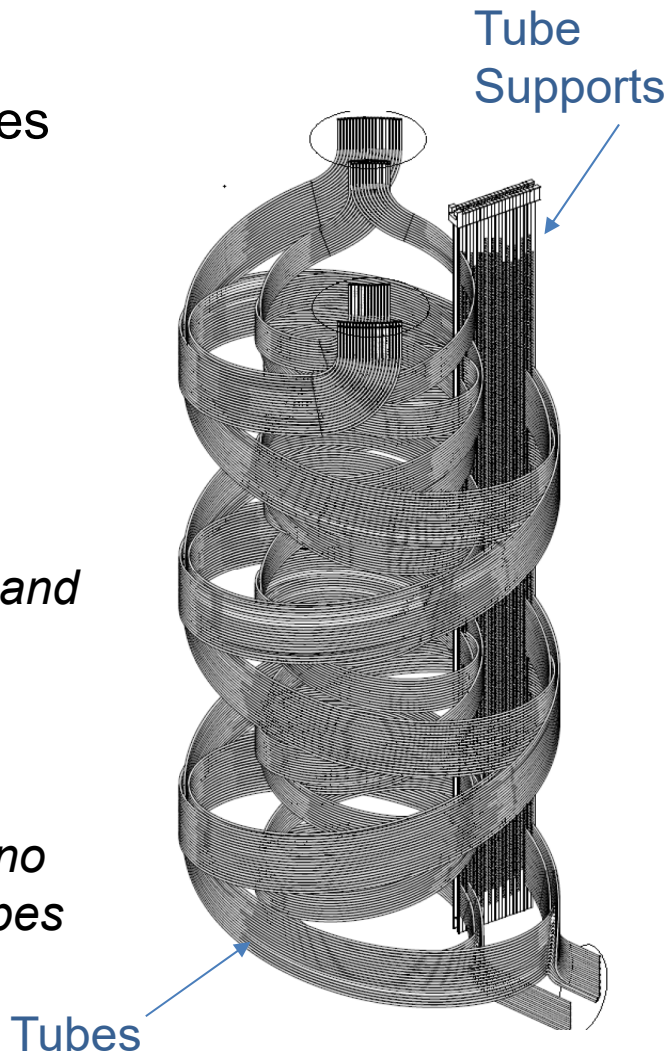
Describe the DWO evaluation model development activities, including validation testing

Summarize information that gives NuScale confidence in the plan

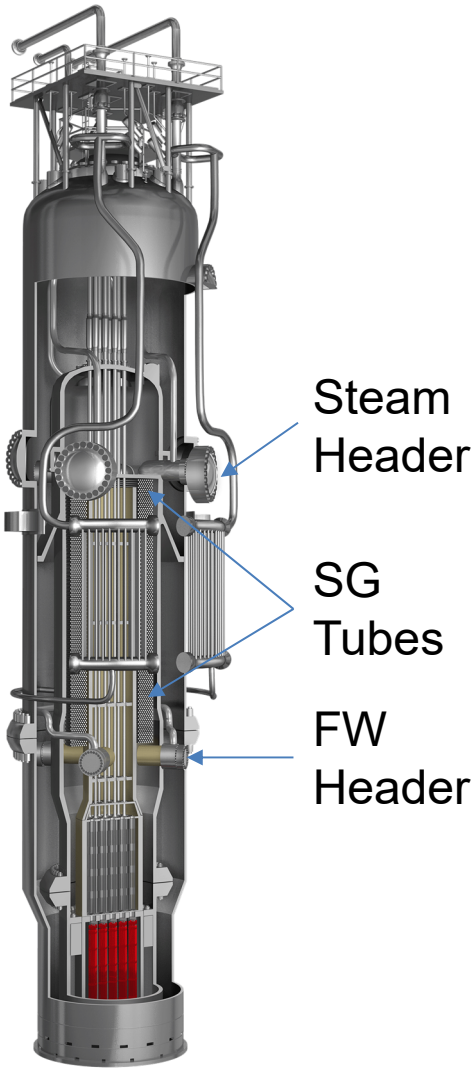
Background

Comments During DCA Review

- Design and performance of SGs not sufficiently validated because of uncertainties associated with unstable DWO on the SG secondary side
  - *Resolution: Additional design, analysis, and testing planned*
- Stability map from NRC differs greatly from NuScale stability map
  - *Resolution: LTR describing stability method and stability map in FSAR*
- Accelerated wear of alloy 690TT SG tubing material a potential concern
  - *Resolution: Analysis and/or testing to show no accelerated wear that would damage SG tubes or degradation of SGIFR performance*



Comments During DCA Review



- Concern that TF-2 is not a prototypical test for NuScale SG design; pump flow is not constant, vertical height difference
  - *Resolution: Additional modifications, scaling, testing, and treatment of uncertainties planned*
- Concern about reverse flow effects on IFR
  - *Resolution: Additional analysis and/or testing (e.g., CVAP)*
- Concern about in-phase oscillations
  - *Resolution: Explicitly evaluated as part of the stability method LTR*

DCA Outcome

- SER
  - NRC did not finalize review of evaluation methodology for analysis of secondary-side instabilities in the SG design
- Created COL Item 3.9-14 to address DWO
  - *A COL applicant that references the NuScale Power Plant design certification will develop an evaluation methodology for the analysis of secondary-side instabilities in the steam generator design. This methodology will address the identification of potential density wave oscillations in the steam generator tubes, and qualification of the applicable portions of the reactor coolant system integral reactor pressure vessel and steam generator given the occurrence of density wave oscillations, including the effects of reverse fluid flows within the tubes.*

DCA Outcome

- Proposed Rule issued in July 2021
- DWO carve-out resolution needs to demonstrate compliance with 10 CFR 50 Appendix A; GDCs 4 and 31
- FSAR changed to indicate inlet flow restrictor design no longer precludes density wave oscillations in the secondary side of SGs
- Develop a method of analysis to predict the thermal-hydraulic conditions of the SG secondary fluid system and resulting loads, stresses, and deformations from density wave oscillations, including reverse flow

NRC Engagement

NRC Engagement

- NRC Engagement Plan Goal
  - Familiarize NRC with approach and elements of NuScale plan to address concerns that resulted in the DCA DWO carve-out
  - Discuss the plan and approach
- Engagement Plan Elements
  - This meeting – introduce overall plan at a high level and cover portions of the plan in more detail
  - SIET visit (1st quarter 2022) – Give NRC opportunity to observe TF-2 testing and review data
  - LTR focus (3rd quarter 2022) – Walkthrough of LTR and EM
  - Submit LTR (4th quarter 2022)
  - Submit SDAA (late 4th quarter 2022) – includes FSAR changes for DWO

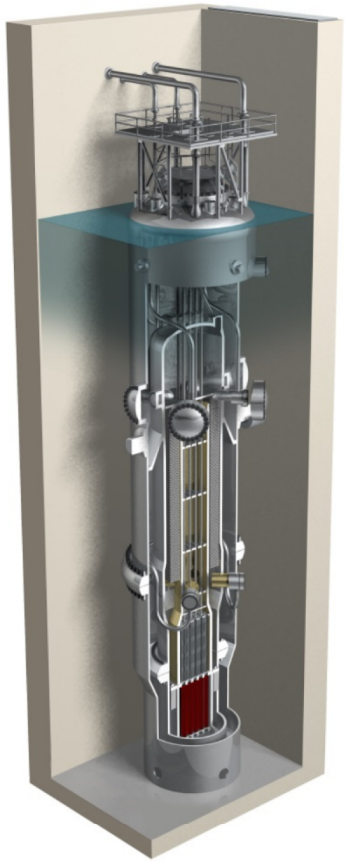
Portland Office
6650 SW Redwood Lane,
Suite 210
Portland, OR 97224
971.371.1592

Corvallis Office
1100 NE Circle Blvd., Suite 200
Corvallis, OR 97330
541.360.0500

Rockville Office
11333 Woodglen Ave., Suite 205
Rockville, MD 20852
301.770.0472

Richland Office
1933 Jadwin Ave., Suite 130
Richland, WA 99354
541.360.0500

Charlotte Office
2815 Coliseum Centre Drive,
Suite 230
Charlotte, NC 28217
980.349.4804



http://www.nuscalepower.com
Twitter: @NuScale_Power

NUSCALE™
Power for all humankind