September 15, 2022 Docket No. 99902078

U.S. Nuclear Regulatory Commission
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SUBJECT: NuScale Power, LLC Submittal of Presentation Materials Entitled "Extended Passive Cooling and Reactivity Control Methodology Topical Report," PM-120829 Revision 0 (Open Session)

NuScale Power, LLC (NuScale) requested a meeting with the NRC technical staff on September 22, 2022, to discuss the topical report, "Extended Passive Cooling and Reactivity Control Methodology," Revision 0.

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 version of the presentation entitled "Extended Passive Cooling and Reactivity Control Methodology Topical Report."

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

If you have any questions, please contact Thomas Griffith at 541-452-7813 or tgriffith@nuscalepower.com.

Sincerely,

Mark W. Shaver

Mark W. Shaver
Manager, Licensing
NuScale Power, LLC

Distribution: Michael Dudek, NRC
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Enclosure 1: "Extended Passive Cooling and Reactivity Control Methodology Topical Report," PM-120829 Revision 0 (Open Session)

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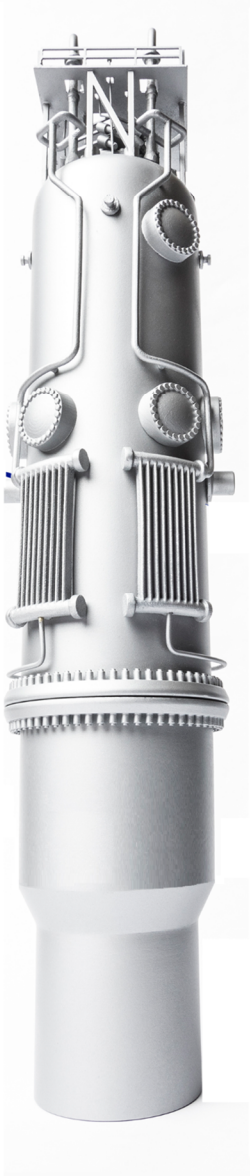
"Extended Passive Cooling and Reactivity Control Methodology Topical Report," PM-120829 Revision 0 (Open Session)



Extended Passive Cooling and Reactivity Control Methodology Topical Report (TR-124587-P, Rev. 0)

Pre-application Meeting
(Open Session)

September 22, 2022

Ben Bristol – Supervisor, Thermal Hydraulics

Meghan McCloskey – Thermal Hydraulics

Tom Griffith – Supervisor, Licensing

Paul Infanger – Licensing

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Acknowledgement and Disclaimer

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Purpose

- NRC Staff engagement provides opportunity for NuScale to share overview and context of:
  - Key design changes implemented between the Design Certification (DCA) (NPM-160) design and design for Standard Design Approval application (SDAA) (NPM-20)
  - Preliminary identification of design change impacts to Chapter 15 safety analysis event progressions, phenomena, evaluation models (EMs), and Extended Passive Cooling (XPC) and Reactivity Control Methodology (RCM) Topical Report
  - NuScale's plan to integrate effects of design changes, EM impacts into XPC&RCM Topical Report

- Pre-application meeting is intended to promote acceptance of upcoming Topical Report submittal, and ultimately the SDAA, on first submittal, by ensuring NRC staff reviewer understanding of design and testing changes since the DCA submittal.

- XPC&RCM Topical Report replaces Long-Term Cooling (LTC) Technical Report for DCA and expands scope from DCA technical report
  - Demonstrate core cooling sustained during extended emergency core cooling system (ECCS) operation (Phase 2) or extended decay heat removal system (DHRS) operation
  - Demonstrate subcriticality is maintained during extended DHRS or extended ECCS operation
  - Demonstrate coolable geometry is maintained during extended ECCS or DHRS operation

Terminology note: DCA design referred to as NuScale Power Module (NPM)-160 or US600.
SDA design for US460 plant includes the CORE250B core design operated in the NPM-20 module.

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Power Uprate and Design Changes

NuScale began developing the 250 MWt design (NPM-20,CORE-250B products) in 2020.

- Design safety enhancements
- Optimize plant design for feasibility of construction, operation, and maintenance
- Increase economic viability

Technical Basis:

- Improvements in safety analysis/core/fuels methods allow for an increase in MWt while maintaining safety analysis margin
- Design changes to improve ECCS performance
- Improve depressurization transient margin (containment vessel (CNV) pressure/temperature)
- Improve boron mixing
- Provide supplemental ECCS boron to mitigate return to power event progressions

Conclusion

- Overall improvements in design and operating margins

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