March 17, 2023

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 Entitled, "Mitigation Strategies for Design-related Portions of 10 CFR 50.155," PM-136895, Revision 0 (Open Session)

NuScale Power, LLC (NuScale) has requested a meeting with the NRC technical staff on March 21, 2023, to discuss Mitigation Strategies for Design-related Portions of 10 CFR 50.155.

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 "Mitigation Strategies for Design-related Portions of 10 CFR 50.155."

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

If you have any questions, please contact Shane Scanlon at 541-452-7119 or at sscanlon@nuscalepower.com.

Sincerely,

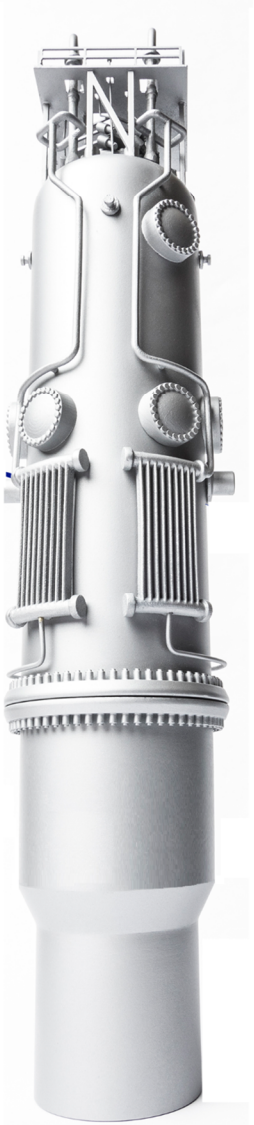
Mark W. Shaver
Acting Director, Regulatory Affairs
NuScale Power, LLC

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

Enclosure:

Mitigation Strategies for Design-related Portions of 10 CFR 50.155, PM-136895, Revision 0 (Open Session)

NuScale Power, LLC
1100 NE Circle Blvd., Suite 200 Corvallis, Oregon 97330 Office 541.360.0500 Fax 541.207.3928
www.nuscalepower.com



Topical Report Pre-Application Presentation

March 21st, 2023

Mitigation Strategies for Design-related Portions of 10 CFR 50.155

Stanton Scoma
Licensing Engineer

Open Session

PM-136895 Rev. 0
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Acknowledgement and Disclaimer

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Purpose

- Describe an approach for the NuScale Power Plant to demonstrate compliance with the design-related portions of 10 CFR 50.155, including a discussion on:
  - general design features of the NuScale Power Plant
  - the event described in 50.155(b)(1)
  - the event described in 50.155(b)(2)
  - items in 50.155(c), (d), and (e)

- Provide the NRC staff with an opportunity to give feedback on the approach

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General Design Features

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General Design Features

- In order for a NuScale Power Plant to demonstrate compliance with the design-related portions of 10 CFR 50.155, applicable general design features will be established. They include:
  - small modular integral pressurized light water reactors, meaning reactor modules composed of a reactor core, primary cooling loop, pressurizer, and steam generator(s) within a reactor vessel, housed within a containment vessel normally operated at sub-atmospheric pressure conditions
  - operating modules partially immersed in water that serves as the ultimate heat sink (UHS)
  - the UHS retained below grade in a structure with up to 12 reactor modules per UHS
  - a safe shutdown earthquake with a peak ground acceleration of 0.5g
  - SSCs capable of performing their safety functions without AC or DC electric power or operator actions for at least 72 hours following a DBE
  - decay heat removal using passive safety systems that do not rely on electrical power to fulfill their safety functions
  - the ability to cope with DBEs without the need for operator actions

- One example of an applicable NuScale Power Plant design includes the NuScale US460 standard design

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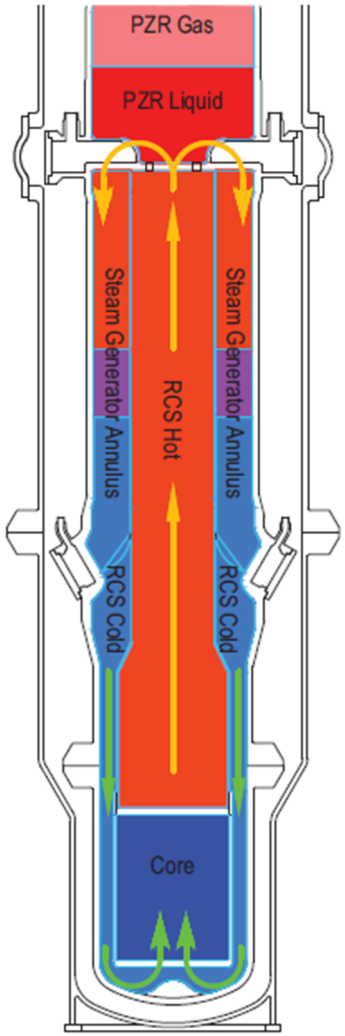
General Design Features – Normal Operations

- As described in US460 SDAA FSAR Section 1.2
  - US460 SDAA FSAR Figure 5.1-3



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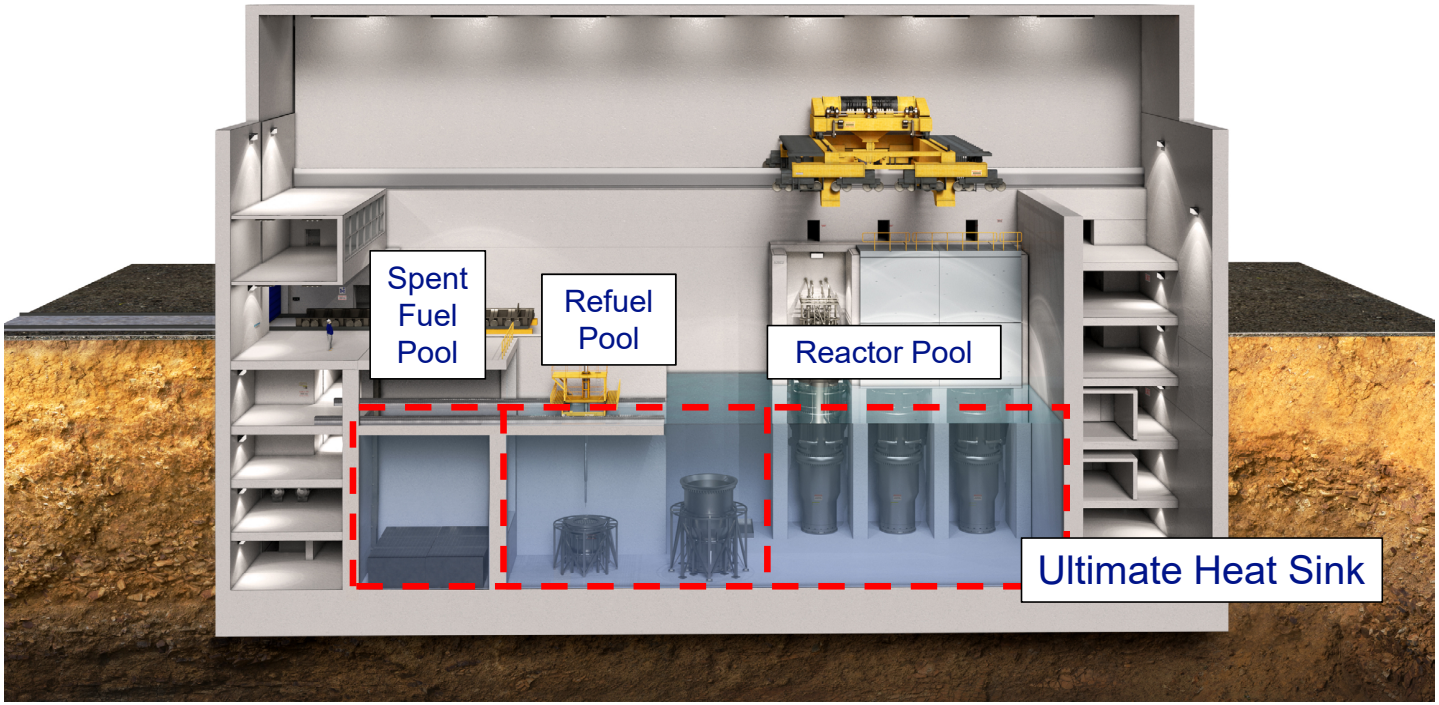
General Design Features – UHS – Decay Heat Removal

- UHS as described in US460 SDAA FSAR Section 1.2 and Section 9.2.5
- Located inside the Reactor Building and below grade
  - The UHS is a large pool of water consisting of the combined water volumes of the reactor pool, refueling pool, and spent fuel pool (SFP)



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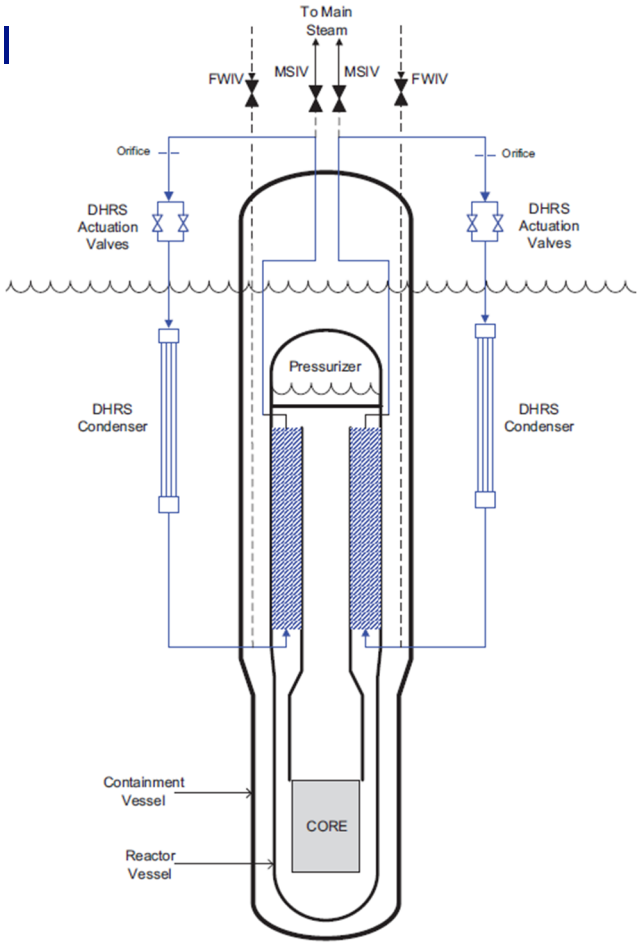
General Design Features – DHRS – Decay Heat Removal

- Two passive systems remove decay heat into the UHS
  - **decay heat removal system (DHRS) - safety-related**
  - emergency core cooling system (ECCS) - safety-related

- DHRS as described in US460 SDAA FSAR Section 1.2 and Section 5.4.3.
  - US460 SDAA FSAR Figure 1.2-6



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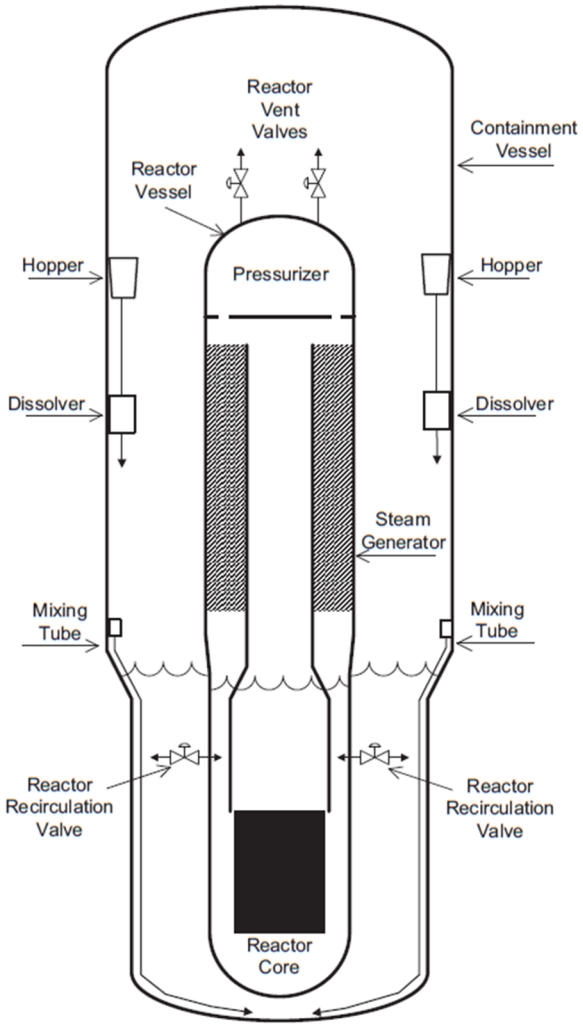
General Design Features – ECCS – Decay Heat Removal

- Two passive systems remove decay heat into the UHS
  - decay heat removal system (DHRS) - safety-related
  - **emergency core cooling system (ECCS) - safety-related**

- ECCS as described in US460 SDAA FSAR Section 1.2 and Section 6.3
  - US460 SDAA FSAR Figure 1.2-7



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End of Open Session

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Acronyms

AC	alternating current
DBE	design basis event
DC	direct current
DHRS	decay heat removal system
ECCS	emergency core cooling system
FSAR	final safety analysis report
FWIV	feedwater isolation valve
MSIV	main steam isolation valve
PZR	pressurizer
RCS	reactor coolant system
SDA	Standard Design Approval
SDAA	Standard Design Approval Application
SFP	spent fuel pool
UHS	ultimate heat sink

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