



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

January 3, 2024

MEMORANDUM TO: William T. Jessup, Chief
Advanced Reactor Licensing Branch 1
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

FROM: Roel A. Brusselmans, Project Manager /RA/
Advanced Reactor Licensing Branch 1
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF THE JUNE 29, 2023, PARTIALLY CLOSED
PUBLIC MEETING WITH TERRAPOWER, LLC, TO DISCUSS
REACTOR STABILITY FOR THE NATRIUM DESIGN (EPID NO.
L-2021-LRM-0071)

Meeting Information:

Applicant: TerraPower, LLC (TerraPower)

Project No.: 99902100

Public Meeting Notice Agencywide Documents Access and Management System (ADAMS)
Accession No.: ML23180A063

Applicant Presentation Slides: ML23171B156

Meeting Attendees: See the enclosure for a list of meeting attendees

CONTACT: Roel A. Brusselmans, NRR/DANU
(301) 415-0829

Meeting Summary:

On June 29, 2023, the U.S. Nuclear Regulatory Commission (NRC) staff held a partially closed public meeting with TerraPower to provide the NRC staff with an overview of reactor stability for the Natrium design. This meeting was held in anticipation of a forthcoming topical report from TerraPower regarding the same subject. Participants included representatives from TerraPower, General Electric Hitachi, Duke Energy, and members of the general public. The NRC staff conducted the meeting in accordance with NRC Management Directive 3.5, "Attendance at NRC Staff-Sponsored Meetings" (ML21180A271).

The NRC staff began the meeting with an introduction and explained that a portion of the meeting would be closed to the public to discuss proprietary information. During the public portion of the meeting, TerraPower gave an overview of the Natrium design including a discussion of project goals, plant overview, and graphics explaining the design. The TerraPower team also explained the concept of reactor stability as it applies to sodium fast reactors, the Natrium stability methodology including the relevant principal design criteria, and a discussion of the Nyquist stability criterion which was utilized in TerraPower's analysis for the Natrium design. Important phenomena with respect to reactor stability for the analysis were also discussed. TerraPower staff also discussed different reactor sites and designs that provided benchmarking data. Lastly, the TerraPower team explained conclusions from their analysis for the Natrium design showing that significant margin to unstable reactor behavior exists at rated conditions (100% power, 100% flow) and beginning of core life. This conclusion included consideration of input uncertainties and model uncertainties.

During the closed portion of the meeting, TerraPower provided additional details and provided further discussion of its reactor stability analysis methodology for the Natrium design. TerraPower representatives and the NRC staff discussed the next steps for future interactions regarding the Natrium reactor design.

No regulatory decisions were made as a result of this meeting.

Enclosure: List of Meeting Attendees

cc: TerraPower Natrium via GovDelivery

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 DATED: JANUARY 3, 2024.

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NRR-001

OFFICE	NRR/DANU/UAL1:PM	NRR/DANU/UAL1:PM	NRR/DANU/UAL1:LA	NRR/DANU/UAL1:BC
NAME	RBrusselmans	MSutton	DGreene	WJessup
DATE	10/20/2023	10/26/2023	11/2/2023	12/22/2023
OFFICE	NRR/DANU/UAL1:PM			
NAME	RBrusselmans			
DATE	1/3/2024			

OFFICIAL RECORD COPY

List of Meeting Attendees

SUMMARY OF THE JUNE 29, 2023, PARTIALLY CLOSED PUBLIC MEETING WITH TERRAPOWER, LLC, TO DISCUSS REACTOR STABILITY FOR THE NATRIUM DESIGN (EPID NO. L-2021-LRM-0071).

June 29, 2023

Name	Organization
Mallecia Sutton	U.S. Nuclear Regulatory Commission (NRC)
Courtney Banks	NRC
Roel Brusselmans	NRC
Andrew Proffitt	NRC
Peter Yarsky	NRC
Alex Siwy	NRC
Candace de Messieres	NRC
Andrew Bielen	NRC
Diana Woodyatt	NRC
Reed Anzalone	NRC
Ryan Sprengel	TerraPower, LLC (TerraPower)
Mike Montecalvo	TerraPower
Matthew Presson	TerraPower
Marc Hotchkiss	TerraPower
Shane Scanlon	TerraPower
Caroline Tilton	TerraPower
Josh Richard	General Electric (GE) Hitachi
Tim Enfinger	GE Hitachi
Preston Decker-Fisk	GE Hitachi
Maria Pfeffer	GE Hitachi
Scott Pfeffer	GE Hitachi
Norman Kunkel	Duke Energy