

**TERRAPOWER, LLC – TOPICAL REPORT NAT-21522
"NATRIUM GENERIC DUAL UNIT TOPICAL REPORT," REVISION 0 AUDIT PLAN (EPID
NO: L-2026-TOP-0010)**

Applicant: TerraPower, LLC

Applicant Address: 15800 Northup Way, Bellevue, WA 98008

Plant Name: Natrium

Project No.: 99902100

Background:

By letter dated March 12, 2026, TerraPower, LLC (TerraPower) submitted topical report (TR) NAT-21522 Revision 0, "Natrium Generic Dual Unit Topical Report" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML26072A301) to the U.S. Nuclear Regulatory Commission (NRC) staff. The TR describes a dual unit Natrium reactor, the Natrium Generic Dual Unit (NGDU) design; explains how it maintains an independent nuclear island (NI) and energy island (EI) substantially similar to the single unit Natrium design described in NATD-LIC-RPRT-0001-A (ML24011A321); and addresses principal design criterion (PDC) 5, "Sharing of structures, systems, and components" from NATD-LIC-RPRT-0002-A (ML24283A066). On April 21, 2026, the NRC staff found that the material presented in the TR provides technical information in sufficient detail to enable the NRC staff to conduct a detailed technical review (ML26078A128).

TerraPower requested the NRC staff's review and approval that the NI-EI independence established in NATD-LIC-RPRT-0001-A is applicable to the NGDU design, that the NGDU design conforms with PDC 5 and requires no additional PDC, and that the TR is acceptable for use in future applications utilizing the NGDU design. The applicant's overall licensing methodology follows the technology-inclusive, risk-informed, and performance-based approach outlined in Revision 0 of Regulatory Guide (RG) 1.233 "Guidance for a Technology-Inclusive, Risk-Informed, and Performance-Based Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light Water Reactors," Revision 0 (ML20091L698).

Purpose:

The purpose of the audit is for the NRC staff to gain a more detailed understanding of TerraPower's NGDU design and how the licensing basis methodology will support or demonstrate compliance with applicable NRC regulations. A secondary purpose of the audit is to identify any information that will require docketing to support the NRC staff's safety evaluation.

Regulatory Audit Basis:

The basis for the audit includes:

- Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50.10, "General Design Criteria for Nuclear Power Plants."

- 10 CFR Part 50.34, “Contents of Applications; Technical Contents.”
- 10 CFR Part 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants.”
- 10 CFR Part 50, Appendix A, “General Design Criteria for Nuclear Power Plants.”
- 10 CFR Part 50, Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants.”
- 10 CFR Part 55, “Operators' Licenses.”
- PDC 5, “Sharing of structures, systems, and components.”

Information and Other Material Necessary for the Regulatory Audit:

TerraPower should be prepared to provide documents, reports, calculations, computer code verification, and other material, as applicable, supporting the analyses documented in the TR. The NRC staff may request that TerraPower make these materials available in an electronic reading room. Initial information requests and discussion items are identified in the enclosed table. Additional requests will be provided during the remainder of the audit.

Team Assignments

Alec Neller	Nuclear Engineer, Audit Lead
Reed Anzalone	Senior Nuclear Engineer, Audit Lead
Mallecia Sutton	Senior Project Manager, Audit Manager
Deion Atkinson	Project Manager

Logistics

Entrance Meeting	TBD
Exit Meeting	TBD

The regulatory audit will follow the guidance in the Office of Nuclear Reactor Regulation Office Instruction LIC-111, "Regulatory Audits," Revision 2 (ML24309A281). Audit meetings will take place in a virtual format, using Microsoft Teams or another similar platform. Audit meetings will be scheduled on an as-needed basis after the entrance meeting and after the NRC staff has the opportunity to review any documents placed in the electronic reading room.

The use of the electronic reading room is acceptable provided that TerraPower establishes measures to limit access to specific NRC staff (e.g., based on the NRC staff's e-mail addresses or the use of passwords which will only be assigned to the NRC staff directly involved in the audit on a need-to-know basis), and to make the documents read-only (i.e., to prevent the NRC staff from saving, copying, downloading, or printing any documents). The conditions associated with the electronic reading room must be maintained throughout the audit process. The NRC staff who should initially be granted access to the portal are those listed in the "Team Members" section above. As needed, the NRC project manager may provide TerraPower with the names of additional NRC staff members who are added to the audit team and should be granted access.

The NRC staff requests that TerraPower ensure that their technical staff are available to answer questions during the audit.

Deliverables

At the completion of the audit, the audit team will issue an audit summary within 90 days after the exit meeting but will strive for a shorter duration. The audit summary will be declared and entered as an official agency record in ADAMS and be made available for public viewing through the publicly available records component of ADAMS.

If you have questions about this audit, please contact me at 301-415-0673 or via email at Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Mallecia Sutton, Senior Project Manager
Advanced Reactors Licensing Branch 1
Division of Advanced Reactors and Non-Power
Production and Utilization Facilities
Office of Nuclear Reactor Regulation

Docket No.: 99902100

cc: TerraPower Natrium via GovDelivery

SUBJECT: TERRAPOWDER, LLC – TOPICAL REPORT NAT-21522 "NATRIUM GENERIC DUAL UNIT TOPICAL REPORT," REVISION 0 AUDIT PLAN (EPID NO: L-2026-TOP-0010) DATED: JULY 06, 2026

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Audit Questions for NAT-21522, “Natrium Generic Dual Unit Topical Report,” Revision 0

AUDIT QUESTION	
1	TR section 5.2.1, “Shared SSCs Located in a Single Unit or NCB,” states that safety-related (SR) structures, systems, and components (SSCs) are located in separate rooms within the nuclear island control building (NCB) substructure. Provide additional clarification on how the NCB substructure prevents accident conditions in one unit (e.g., electrical fires) from propagating to rooms housing SR SSCs for the other unit.
2	TR section 4.2.7, “Shared Electrical Systems,” states that sharing of the NI uninterruptible AC power supply system and the NI DC power supply system is dependent on whether the loads associated with a specific SSC are shared between units. Please provide additional detail on how these electrical SSCs are shared between units.
3	TR section 4.2.6, “Shared Instrumentation and Controls (I&C) Systems,” states that the only I&C SSCs shared between units are those providing indications supporting post-accident monitoring and those providing indications in the control room. TR Section 5.2.1 states that the radiation monitoring system (RMS) is shared between units in a manner that ensures a failure in one unit does not affect signals required to perform non-safety-related with special treatment (NSRST) functions in the other. Please provide additional detail on how the RMS is shared between units (e.g., whether only detectors in shared spaces such as the fuel handling building are shared, or whether additional integration exists).
4	TR section 5.2.1 states that the gaseous radwaste processing system (RWG) is shared between units and that such sharing does not affect its ability to perform NSRST functions. Provide additional clarification on how the RWG is shared and why this shared configuration does not impact the SSC’s NSRST functions.
5	TR section 6.3, “Key Aspects of NI and EI Independence,” discusses EI connections (e.g., salt tank interconnects, potential shared steam generation interfaces) that are under consideration for the dual-unit design. Provide additional detail on whether these cross-connections would affect the frequency or consequence classification of licensing basis events associated with EI failures (e.g., loss of salt flow, high salt temperature, increased salt flow, low salt temperature, and low or high salt pressure).