



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

April 17, 2025

George Wilson  
Vice President, Regulatory Affairs  
TerraPower, LLC  
15800 Northup Way  
Bellevue, WA 98008

SUBJECT: TERRAPOWER, LLC – FINAL SAFETY EVALUATION OF NAT-9390, “DESIGN BASIS ACCIDENT METHODOLOGY FOR IN-VESSEL EVENTS WITHOUT RADIOLOGICAL RELEASE,” REVISION 2 (EPID NO. L-2023-TOP-0050)

Dear George Wilson:

By letter dated September 29, 2023, TerraPower, LLC, (TerraPower) submitted Topical Report (TR) TP-LIC-RPT-0004, “Design Basis Accident Methodology for In-Vessel Events without Radiological Release,” Revision 0 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML23272A260), which summarizes the approach taken to satisfy the guidance outlined in Regulatory Guide (RG) 1.203, “Evaluation Model Development and Assessment Process (EMDAP),” for in-vessel design basis accident (DBA) events without radiological release in the Sodium reactor. On October 31, 2023, the U.S. Nuclear Regulatory Commission (NRC) staff determined that the TR provided sufficient information for the NRC staff to begin its detailed technical review (ML23303A168).

On March 5, 2024, the NRC staff transmitted an audit plan to TerraPower (ML24064A195) and subsequently conducted an audit of materials related to the TR from March 25, 2024, to June 27, 2024. The NRC staff issued the audit summary dated November 27, 2024 (ML24255A017). On October 11, 2024, TerraPower submitted a revision of the TR (ML24295A202), which was renumbered from TP-LIC-RPT-0004 to NAT-9390, to clarify portions of the TR as discussed in the audit summary.

The enclosed final Safety Evaluation (SE) is being provided to TerraPower, because the NRC staff has found NAT-9390, Revision 2, acceptable for referencing in licensing actions to the extent specified and under the limitations and conditions delineated in the TR and the SE. The final SE defines the basis for the NRC staff’s acceptance of the TR.

The NRC staff requests that TerraPower submit to NRC staff an approved version of this TR within 3 months of receipt of this letter. The approved version should incorporate this letter and the enclosed SE after the title page. The approved version should include a “-A” (designating approved) following the TR identification symbol.

G. Wilson

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If you have any questions, please contact Roel Brusselmans at (301) 415-0829 or via email at [Roel.Brusselmans@nrc.gov](mailto:Roel.Brusselmans@nrc.gov).

Sincerely,

*/RA/*

Joshua Borromeo, Chief  
Advanced Reactor Licensing Branch 1  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

Project No.: 99902100

Enclosure:  
As stated

cc: TerraPower Natrium via GovDelivery

SUBJECT: TERRAPOWER, LLC – FINAL SAFETY EVALUATION FOR NATRIUM TOPICAL  
REPORT NAT-9390, “DESIGN BASIS ACCIDENT METHODOLOGY FOR IN-VESSEL  
EVENTS WITHOUT RADIOLOGICAL RELEASE,” REVISION 2 (EPID L-2023-TOP-  
0050) DATED: APRIL 17, 2025

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**ADAMS Accession Nos.:****Pkg: ML25106A038****Letter: ML25106A040****Public Enclosure: ML25106A043****Non-Public Enclosure (Proprietary - ECI): ML25106A042**

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