



March 28, 2024

TP-LIC-LET-0124
Project Number 99902100

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: Submittal of the Construction Permit Application for the Natrium Reactor Plant, Kemmerer Power Station Unit 1

TerraPower, LLC (TerraPower) hereby submits on behalf of US SFR Owner, LLC (USO), a wholly owned subsidiary of TerraPower, a construction permit application in accordance with Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR 50), "Domestic Licensing of Production and Utilization Facilities," to construct a Natrium™ Reactor Plant¹, Kemmerer Power Station Unit 1, in Lincoln County, Wyoming as part of participation in the U.S. Department of Energy's Advanced Reactor Demonstration Program. The Natrium Reactor Plant is an 840 megawatts thermal, pool-type, sodium-cooled fast reactor that contains a compact and simple safety envelope and a molten salt energy storage system.

This construction permit application for Kemmerer Power Station Unit 1 includes General and Financial Information, a Preliminary Safety Analysis Report, an Environmental Report, and Regulatory Exemptions. In addition, a Core Design and Thermal Hydraulic Technical Report, Major Accident Methodology Report, and Preliminary Emergency Planning Zone Determination Analysis Technical Report are enclosed to support the Preliminary Safety Analysis Report.

An enclosure transmitted herewith contains security-related information.
When separated from the sensitive information, this document is decontrolled.

¹ Natrium is a TerraPower and GE-Hitachi technology.



Enclosures 9, 10, 11, 12, 13, and 14 contain proprietary or security-related information and as such, it is requested that they be withheld from public disclosure in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." An affidavit certifying the basis for the request to withhold proprietary information from public disclosure is included as Enclosure 8.

Enclosure 12 also contains Export Controlled Information (ECI) which can be disclosed to Foreign Nationals only in accordance with the requirements of 15 CFR 730 and 10 CFR 810, as applicable. Proprietary, security-related, and ECI materials have been redacted from the versions provided in Enclosures 1, 2, 3, 5, 6, and 7; redacted information is identified using [[]]^{(a)(4)}, [[]]^{SRI}, or [[]]^{ECI}.

The preapplication interactions transmitted by letter dated June 8, 2021, "Regulatory Engagement Plan for the Natrium Reactor" (Agencywide Documents Access and Management Systems (ADAMS) Accession Number ML21159A221) and additional interactions identified during the preapplication phase are complete and meet the guidance contained in DANU-ISG-2022-01, "Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications - Roadmap," Appendix A, "Pre-Application Engagement Guidance" (ADAMS Accession Number ML23277A139). As noted in DANU-ISG-2022-01, preapplication interactions are equivalent to a staged licensing approach that allows early identification and resolution of technical and policy issues, optimizes both safety and environmental reviews, and allows the NRC staff to establish a shorter review schedule than the generic schedules. Based on the robust preapplication engagements, TerraPower requests a 24-month review schedule be considered for the construction permit application for Kemmerer Power Station Unit 1.

In addition, the NRC staff performed a preapplication readiness assessment of the construction permit application content from January 10, 2024, through February 22, 2024, as documented by letter dated March 19, 2024, "TerraPower, LLC – Preapplication Readiness Assessment Report for Kemmerer Power Station Unit 1 Preliminary Construction Permit Application" (ADAMS ML24060A227). The NRC staff did not identify any information gaps necessary to meet the information requirements for the Preliminary Safety Analysis Report in 10 CFR 50.34(a); however, TerraPower reviewed the general and specific observations provided in the Preapplication Readiness Assessment Report to inform the construction permit application for Kemmerer Power Station Unit 1.



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TerraPower understands that a filing fee and fees for the construction permit review are based on the full costs of the review, in accordance with 10 CFR 50.30(e). TerraPower requests that the fees be invoiced for payment.

Activities that are subject to other licenses will be embedded in the 10 CFR 50 licensed facility, including the ability to receive, possess, produce, use, and transfer special nuclear material, source material, and byproduct material. Further information is provided in Enclosure 1 and requests for additional licenses will be provided with a future application and request for an operating license under 10 CFR 50.34(b) or earlier, if needed, to support activities on the construction site.

TerraPower is in good faith negotiations with the Department of Energy to enter into a contract for the disposal of high-level waste and nuclear fuel under section 302(b) of the Nuclear Waste Policy Act of 1982, as amended. A letter documenting the good faith negotiations is available for review.

If you have questions or need additional information, please contact Ryan Sprengel at rsprengel@terrapower.com.

I declare under penalty of perjury that the foregoing is true and accurate.
Executed on March 28, 2024.

Sincerely,

A handwritten signature in cursive script that reads "George Wilson".

George Wilson
Vice President, Regulatory Affairs
TerraPower, LLC



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Enclosures:

1. General and Financial Information - Public
2. Preliminary Safety Analysis Report – Public
3. Environmental Report - Public
4. Regulatory Exemptions - Public
5. Core Design and Thermal Hydraulic Technical Report - Public
6. Major Accident Methodology Report - Public
7. Preliminary Emergency Planning Zone Determination Analysis Technical Report - Public
8. TerraPower, LLC Affidavit and Request for Withholding from Public Disclosure (10 CFR 2.390(a)(4)) - Public
9. General and Financial Information - Proprietary (Non-Public)
10. Preliminary Safety Analysis Report - Security-Related Information (Non-Public)
11. Environmental Report - Proprietary (Non-Public)
12. Core Design and Thermal Hydraulic Technical Report - Proprietary and Export Controlled Information (Non-Public)
13. Major Accident Methodology Report - Proprietary (Non-Public)
14. Preliminary Emergency Planning Zone Determination Analysis Technical Report - Proprietary (Non-Public)

cc: William Jessup, NRC
Mallecia Sutton, NRC
Nathan Howard, DOE
Jeff Ciocco, DOE
NRC, Region II
NRC, Region IV