



April 7, 2025

TP-LIC-LET-0417  
Docket Number 50-613

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

**Subject:** Supplement to Exemption Request and Application of Topical Report  
NATD-LIC.RPRT-0001-A for Construction of the Natrium Energy Island at Kemmerer  
Unit 1

**Reference:** 1. TerraPower, LLC, TP-LIC-LET-0345, "Exemption Request Associated with  
Construction of the Natrium Energy Island", September 9, 2024, ML24253A023  
  
2. TerraPower, LLC, TP-LIC-LET-0382, "Exemption Request and Application of  
Topical Report NATD-LIC0RPRT-0001-A for Construction of the Natrium Energy  
Island at Kemmerer Unit 1", February 28, 2025, ML25059A093

TerraPower, LLC (TerraPower), on behalf of US SFR Owner, LLC (USO), a wholly owned subsidiary of TerraPower, submitted an exemption request from certain requirements of 10 CFR 50.10(a) and 10 CFR 51.4 as they apply to the Natrium<sup>®</sup> Energy Island (EI)<sup>1</sup>(Reference 1). In response to audit discussions with the U.S. Nuclear Regulatory Commission (NRC) staff, TerraPower superseded the request in Reference 1 with the request in Reference 2.

This letter supplements the exemption request in Reference 2. Enclosure 1 provides additional information related to special circumstances for 10 CFR 50.12(a) and an explanation of structures, systems, and components located within the restricted area as defined by 10 CFR 20.1003.

This letter makes no new or revised regulatory commitments

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<sup>1</sup> Natrium is a TerraPower and GE-Hitachi technology.



If you have any questions regarding this submittal, please contact Nick Kellenberger at [nkellenberger@terrapower.com](mailto:nkellenberger@terrapower.com) or Ian Gifford at [igifford@terrapower.com](mailto:igifford@terrapower.com).

Sincerely,

*George Wilson*

George Wilson  
Senior Vice President, Regulatory Affairs  
TerraPower, LLC

Enclosure 1: Supplement to Exemption Request Associated with Construction of the Natrium Energy Island

cc: Mallecia Sutton, NRC  
Joshua Borromeo, NRC  
Nathan Howard, DOE  
Jeff Ciocco, DOE

**ENCLOSURE 1**

**Supplement to Exemption Request Associated with Construction of the Natrium Energy Island**

## Supplement to Energy Island Construction Exemption Request

### Additional Criteria of 10 CFR 50.12(a)

Special circumstances are present per 10 CFR 50.12(a)(2)(iii) in that compliance with 10 CFR 50.10(a)(1)(iv) and 10 CFR 51.4 definition of construction (1)(i)(D) would result in undue hardship and costs that are significantly in excess of those contemplated when the regulation was adopted. The adopted version 10 CFR 50.10(a)(1)(iv) and 10 CFR 51.4 definition of construction (1)(i)(D) specifically included structures, systems, and components (SSCs) whose failure could cause a reactor scram or actuation of a safety-related system within the definition of construction. The rule requires either a construction permit or limited work authorization to construct an SSC meeting this requirement. As discussed in Reference 1, and evaluated by NRC in Reference 2, the Natrium reactor design incorporates several features that support independence of the Nuclear Island (NI) and Energy Island (EI). Independence is supported by EI SSCs classified as non-safety-related with no special treatment (NST) not having a reasonable nexus to radiological health and safety or security. This independence is the basis for this exemption and construction of the EI prior to receiving the construction permit for Kemmerer Unit 1. The approach, having independence between an NI and EI, and the opportunity it presents for alternative approaches to construction of nuclear power production facilities, was not considered when 10 CFR 50.10(a)(1)(iv) and 10 CFR 51.4 definition of construction (1)(i)(D) were adopted.

Without an exemption, construction of EI SSCs within the scope of the exemption will not be authorized until after the construction permit is issued. Substantial schedule delays for the Natrium Demonstration Project, as supported by a public-private partnership with the Department of Energy (DOE) Advanced Reactor Demonstration Program (ARDP), would be incurred. This delay will not serve the underlying purpose of the rule because EI SSCs classified as NST do not have a reasonable nexus to nuclear safety or security. The cost of any delay of the commercial operation of Kemmerer Unit 1 would depend upon a number of uncertain factors but is expected to be substantial. The added costs and construction delays would not be in the public interest, as the benefits, such as the need for power and reduced carbon emissions as described in the Kemmerer Unit 1 construction permit application Environmental Report (Reference 3), would not be realized. Delay in the start of construction of the EI SSCs within the scope of the exemption to the projected date for issuance of the construction permit will result in substantial costs due to delays in construction and commercial operation.

### Relation of SSCs to the Restricted Area

The restricted area is defined in 10 CFR 20.1003, Definitions, as:

*Restricted area means an area, access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials. Restricted area does not include areas used as residential quarters, but separate rooms in a residential building may be set apart as a restricted area.*

The EI SSCs within the scope of the exemption request submitted as Reference 4 are all contained within the restricted area of Kemmerer Unit 1.

## References

1. TerraPower, "Regulatory Management of Natrium Nuclear Island and Energy Island Design Interfaces," Topical Report NATD-LIC-RPRT-0001, Revision 0, October 3, 2023, ML22277A824.
2. U.S. NRC, "TerraPower, LLC – Final Safety Evaluation of Topical Report NATD-LIC-RPRT-0001, 'Regulatory Management Of Natrium Nuclear Island And Energy Island Design Interfaces,'" (EPID: L-2022-TOP-0045), Revision 0, October 4, 2023, ML23257A258.
3. TerraPower, LLC on behalf of US SFR Owner, LLC, "Submittal of the Construction Permit Application for the Natrium Reactor Plant, Kemmerer Power Station, Unit 1," March 28, 2024, ML24088A060.
4. TerraPower, LLC, TP-LIC-LET-0382, "Exemption Request and Application of Topical Report NATD-LIC0RPRT-0001-A for Construction of the Natrium Energy Island at Kemmerer Unit 1", February 28, 2025, ML25059A093