



## **POLICY ISSUE** **(Information)**

December 18, 2025

SECY-25-0102

**FOR:** The Commissioners

**FROM:** Michael F. King  
Acting Executive Director for Operations

**SUBJECT:** STAFF'S STATEMENT IN SUPPORT OF THE UNCONTESTED  
HEARING FOR THE ISSUANCE OF A CONSTRUCTION PERMIT FOR  
THE USO KEMMERER POWER STATION, UNIT 1

**PURPOSE:**

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the US SFR Owner, LLC (USO), a wholly owned subsidiary of TerraPower, LLC (TerraPower), construction permit (CP) application for a reactor facility designated as Kemmerer Power Station, Unit 1 (KU1). This paper serves as the staff's primary pre-filed testimony for the uncontested (mandatory) hearing for the issuance of a CP to USO under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." This paper, with its references, also provides information to support the Commission's determination that the staff's review adequately supports the findings for issuance of a CP under 10 CFR Part 50. These findings are set forth in 10 CFR 50.35, "Issuance of construction permits"; 10 CFR 50.40, "Common standards"; 10 CFR 50.50, "Issuance of licenses and construction permits"; and 10 CFR 51.105, "Public hearings in proceedings for issuance of construction permits or early site permits; limited work authorizations."

In accordance with the internal Commission procedures, this paper focuses on nonroutine matters supporting the findings related to 10 CFR Part 50 and 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Nonroutine matters of particular importance are matters that relate to unique features of the facility or novel issues that arose as part of the review process.

This paper does not address any new commitments or resource implications.

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SUMMARY:

The staff's review of the KU1 CP application under 10 CFR Part 50 is complete. The staff documented the results of its safety review in the final safety evaluation (SE) completed in November 2025 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML25329A252). The staff documented the results of its environmental review in the final environmental impact statement (EIS), issued in October 2025 as NUREG-2268, "Environmental Impact Statement for the Construction Permit Application for Kemmerer Power Station Unit 1: Final Report" (ML25287A017). Drafts of the CP and Record of Decision are available (ML25324A371 and ML25324A373, respectively).

The staff issued the final SE and EIS for the KU1 application significantly ahead of the initial schedule communicated in its letter dated June 12, 2024 (ML24162A063).<sup>1</sup> This early completion reflects the NRC's continued commitment to safety, regulatory excellence, and timely decision-making.

The acceleration of the staff's safety review was enabled by continued application of enhanced licensing practices such as the effective use of a core team, extensive use of audits, and streamlined documentation of staff findings, in addition to streamlined internal processes and effective coordination with NRC staff management and the Advisory Committee on Reactor Safeguards (ACRS). Further, to support an expedited and risk-informed legal review, the staff identified the areas of the review that the staff believed posed the greatest risk and requested Office of the General Counsel (OGC) review of those aspects of the staff's review. Specifically, the staff provided some chapters and sections of chapters to OGC for review and advice, while a limited number were reviewed for a "no legal objection." The staff designated other chapters and sections of chapters as not requiring OGC review. Although not a license decision, a similar process was employed for the NuScale US460 Standard Design Approval review. OGC's focused involvement in the subject review contributed to the effort to expedite the overall review process and schedule without shortcutting any safety aspects. These efforts demonstrate the agency's ability to innovate within its regulatory framework and deliver more timely outcomes. The staff and OGC plan to continue this approach for future advanced reactor reviews.

The KU1 environmental review also marked a significant step forward in the continued modernization of NRC environmental reviews and documentation. The development of the EIS employed a novel, more accessible format that prioritized clarity and usability for both technical stakeholders and the public. At approximately one-third the length of a traditional NRC power reactor EIS, this new format reflects a deliberate effort to enhance transparency, improve public engagement, and streamline the review process, all while maintaining the NRC's high standards for regulatory rigor and in compliance with governing law.

These accomplishments exemplify the NRC's ability to embrace a culture of innovation within its regulatory framework while remaining committed to the principles of good regulation. The staff's performance on this review supports the agency's implementation of the Accelerating Deployment of Versatile, Advanced Nuclear for Clean Energy Act of 2024 (ADVANCE Act) and,

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<sup>1</sup> Consistent with the agency's OMB approved lapse plan, development of this SE continued during the lapse in appropriations from October 1 to November 13, 2025, which further demonstrates the NRC's commitment to safety, regulatory excellence, and timely decision-making.



although not within the scope of Executive Order 14300, “Ordering the Reform of the Nuclear Regulatory Commission,” dated May 23, 2025, also demonstrates the agency’s responsiveness to it and aligns with the NRC’s strategic vision for enabling the safe and secure use of advanced reactor technologies.

This paper focuses on nonroutine matters, such as unique features of KU1 or novel review issues. Lastly, this paper addresses the findings in 10 CFR 50.35, 10 CFR 50.40, 10 CFR 50.50, and 10 CFR 51.105 and provides, with its references, an adequate basis for the Commission to conclude that each of these findings can be made for the KU1 CP application.

## **BACKGROUND:**

### **I. Application History**

#### *Preapplication Activities by TerraPower*

TerraPower, before submitting the application on behalf of USO, engaged with the staff in extensive preapplication activities, which included topical reports (TRs), white papers, and a readiness assessment. This preapplication engagement provided an avenue for TerraPower to identify and resolve regulatory questions as it refined the preliminary design of the Sodium reactor and its plans for construction of KU1 and other future facilities. The engagement also allowed the NRC staff to gain sufficient knowledge of the new and novel technologies and approaches that TerraPower planned to employ. Some technical issues were addressed in parallel with the staff’s review of the CP application, with the staff reviewing 13 TerraPower TRs concurrently with the application.

The TRs, white papers, and the associated NRC staff SEs and feedback are available on the NRC website at <https://www.nrc.gov/reactors/new-reactors/advanced/who-were-working-with/pre-application-activities/sodium>. The staff reviewed and prepared an SE for each submitted TR, which included NRC staff-imposed limitations or conditions on its use. The TRs that were incorporated by reference in the preliminary safety analysis report (PSAR) are listed in table 1.4-2 of the PSAR. The staff’s safety review confirmed that the limitations or conditions for the TRs referenced in the PSAR were satisfied or could reasonably be left to the operating license (OL) application.

A readiness assessment was conducted for both the KU1 PSAR and the environmental report (ER). The staff issued the preapplication readiness assessment report in March 2024 (ML24060A227).

#### *Application, Ownership, and Location*

By letter dated March 28, 2024, TerraPower, on behalf of USO, submitted an application for a CP for KU1 that included all required components of a CP application (ML24088A059). On May 21, 2024, the NRC staff issued a letter accepting the KU1 CP application for detailed review (ML24135A109). On October 3, 2025, TerraPower, on behalf of USO, submitted an updated version (Revision 1) of the KU1 PSAR (ML25276A288). Portions of PSAR chapters 8 and 11 were superseded by a supplement dated November 19, 2025 (ML25323A489). Other supplements to the application are summarized in chapter 1 of the staff’s SE.

USO is a U.S.-based company created to serve as a vehicle for TerraPower’s U.S. Department of Energy Advanced Reactor Demonstration Project bid for the Sodium Demonstration Project.



USO will own 100 percent of KU1, will be the NRC permit holder and responsible for the construction of KU1, and is a wholly owned subsidiary of TerraPower. The agreements and relationship between USO and TerraPower are described in a letter dated May 2, 2024 (ML24123A242). In a case of first impression, the NRC staff found that USO is technically qualified based upon the agreements and relationship between USO and TerraPower.

The KU1 facility is proposed to be located within Lincoln County, Wyoming, and the site is approximately 290 acres.

The publicly available portions of the application are available in ADAMS and on the NRC website at <https://www.nrc.gov/reading-rm/adams.html>. Portions of the application contain nonpublic information and have been withheld from public disclosure in accordance with 10 CFR 2.390, "Public inspections, exemptions, requests for withholding." The nonpublic version of the application is also available in ADAMS but is restricted to authorized users.

### *Overview of the Staff's Review*

The KU1 CP application review consisted of two concurrent reviews: (1) a safety review of the KU1 PSAR and (2) an environmental review of the KU1 ER. USO stated in enclosure 1 of the application that it expects to apply for a future Class 103 OL for a 40-year period. The staff reviewed the KU1 PSAR against applicable regulatory requirements using appropriate regulatory guidance and standards, as discussed below, to assess the sufficiency of the preliminary KU1 design information. USO is the first applicant to develop its PSAR using the Licensing Modernization Project (LMP) methodology described in Nuclear Energy Institute (NEI) 18-04, Revision 1, "Risk-Informed Performance-Based Technology Inclusive Guidance for Non-Light Water Reactor Licensing Basis Development," issued August 2019 (ML19241A472), as endorsed by the NRC staff in Regulatory Guide (RG) 1.233, Revision 0, "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," issued June 2020 (ML20091L698). The NRC staff considers the application of a fully risk-informed, performance-based (RIPB) licensing approach to be a novel aspect of the KU1 CP application and discusses this in more detail below. The use of an RIPB licensing approach had a significant influence on the staff's safety review approach as compared to prior CP reviews for non-light-water reactors (non-LWRs).

As part of the safety review, the staff evaluated the information on the KU1 structures, systems, and components (SSCs), giving special attention to design and operating characteristics, unusual or novel design features, and principal safety considerations. The staff evaluated the preliminary design of KU1 to ensure the sufficiency of principal design criteria (PDC), design bases, and information relative to materials of construction, general arrangements, and approximate dimensions, to provide assurance that the final design would conform to the design bases. The staff also evaluated SSCs to verify that they would adequately provide for the prevention of accidents and the mitigation of consequences of accidents. The staff performed the preliminary analysis and evaluation of the design and performance of the SSCs of KU1 with the objective of assessing the risk to public health and safety resulting from its operation.

To issue a CP, the NRC is required to consider the environmental impacts of the proposed action under the National Environmental Policy Act of 1969, as amended (NEPA). The NRC regulations that implement NEPA (10 CFR Part 51) identify the issuance of a CP for a nuclear power reactor as an action requiring an EIS (10 CFR 51.20, "Criteria for and identification of licensing and regulatory actions requiring environmental impact statements"). The applicant's



ER and the NRC staff's final EIS evaluated the potential environmental impacts of constructing, operating, and decommissioning KU1 and the KU1 site. The ER and the final EIS also evaluated the environmental impacts of reasonable alternatives to the proposed action. The alternatives considered were the no-action alternative and building KU1 at alternative sites. As part of its independent assessment of the information provided by USO, the staff contacted Federal, State, and local agencies, as well as federally recognized Indian Tribes. The staff invited these stakeholders and the public to provide information relevant to the environmental review during its scoping process and invited them to comment on the draft EIS, which was issued on June 18, 2025 (ML25154A651). The staff considered all comments received and additional information provided through the environmental audit (ML25273A038) in the preparation of the final EIS.

### *Advisory Committee on Reactor Safeguards*

To support the ACRS in conducting its independent review of novel issues and reporting to the Commission on the KU1 CP application, TerraPower<sup>2</sup> presented information on the application and the NRC staff presented the findings of certain portions of its SE to the cognizant ACRS subcommittee during meetings held October 8–9 and October 21–23, 2025. Following the full committee meeting on November 5, 2025, the ACRS issued a letter on November 16, 2025 (ML25311A150), thereby fulfilling the requirement under 10 CFR 50.58, "Hearings and report of the Advisory Committee on Reactor Safeguards," and section 182b. of the Atomic Energy Act of 1954, as amended (AEA), for ACRS review and reporting on CP applications for nuclear facilities. The ACRS conclusions and recommendations are discussed later in this paper.

## II. Outreach

### *Public Meetings*

Before the NRC docketed the CP application for KU1, the staff held a public outreach meeting in Kemmerer, Wyoming, on November 7, 2023 (ML23306A210), to discuss the safety and environmental reviews of the anticipated CP application, describe opportunities for public participation in the review process, and take questions from the public. On July 16, 2024 (ML24197A073), the staff held a scoping meeting in Kemmerer, Wyoming, to discuss the environmental scoping process and to give members of the public an opportunity to comment on environmental issues that the NRC should consider during its review of the application. After issuing the draft EIS in June 2025, the staff held a public meeting on July 22, 2025 (ML25202A108), in Kemmerer, Wyoming, to gather comments on the document.

### *Federal Register Notices*

The staff published *Federal Register* (FR) notices, as required, for key milestones of the licensing process as follows:

- On May 14, 2024, the agency published a notice of receipt and availability of the application (89 FR 42004).

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<sup>2</sup> The ACRS letter notes that the application was submitted by TerraPower on behalf of USO, but for simplicity refers to the applicant as TerraPower.



- On June 4, 2024, the staff published a notice docketing the application and the opportunity to request a hearing and petition for leave to intervene for the KU1 CP application (89 FR 47997).
- On June 12, 2024, the staff published a notice of intent to conduct a scoping process and prepare an EIS (89 FR 49917).
- On July 20, 2025, the staff published a notice of the availability of the draft EIS for public comment (90 FR 26333).
- On October 23, 2025, the staff published a notice of issuance of the final EIS (90 FR 48507).

### *Consultations*

In accordance with section 657 of the Energy Policy Act of 2005, the NRC completed a consultation with the U.S. Department of Homeland Security concerning the potential vulnerabilities to terrorist attack of the location of the proposed nuclear facility (ML25161A205). As part of its environmental review, and in accordance with NEPA and other applicable statutes, including the Endangered Species Act of 1973, as amended, and the National Historic Preservation Act of 1966, as amended (NHPA), the staff consulted with and obtained input from the appropriate Federal, State, and local agencies, as well as federally recognized Indian Tribes.

### *Adjudicatory Actions*

On June 4, 2024, the staff published in the FR (89 FR 47997) a notice of opportunity to request a hearing and petition for leave to intervene and an order imposing procedures for access to sensitive unclassified nonsafeguards information. No petitions for leave to intervene were filed following publication of this notice.

### III. Review Process and Methodology

To ensure quality, consistency, and completeness in the preparation of its final SE and final EIS, the staff primarily used the applicable processes and methodologies described in the following key documents:

- RG 1.233, Revision 0. This guidance endorses, with clarifications, NEI 18-04, Revision 1, which is the industry guidance on using a technology-inclusive RIPB methodology to inform the licensing basis and content of applications for non-LWRs.
- RG 1.253, Revision 0, "Guidance for a Technology-Inclusive Content-of-Application Methodology to Inform the Licensing Basis and Content of Applications for Licenses, Certifications, and Approvals for Non-Light-Water Reactors," issued March 2024 (ML23269A222). This guidance endorses, with clarifications and additions, NEI 21-07, Revision 1, "Technology Inclusive Guidance for Non-Light Water Reactors, Safety Analysis Report Content: For Applicants Using the NEI 18-04 Methodology," issued February 2022 (ML22060A190), which provides an acceptable method for developing portions of the safety analysis report content for applicants using NEI 18-04.



- RG 1.247, for trial use, “Acceptability of Probabilistic Risk Assessment Results for Non-Light-Water Reactor Risk-Informed Activities,” issued March 2022 (ML21235A008). This guidance outlines an acceptable method for evaluating whether a design-specific or plant-specific probabilistic risk assessment (PRA) provides sufficient confidence in its results to support its use in regulatory decision-making for non-LWRs.
- Interim Staff Guidance (ISG) DANU-ISG-2022-01, “Review of Risk-Informed, Technology-Inclusive Advanced Reactor Applications—Roadmap,” issued March 2024 (ML23277A139). This guidance facilitates the preparation of non-LWR applications using the NEI 18-04 process for developing the licensing basis for CPs under 10 CFR Part 50. The ISG also provides guidance to staff for reviewing such applications.
- NUREG-1555, “Standard Review Plans for Environmental Reviews for Nuclear Power Plants,” issued October 1999 (ML17060A994), together with Supplement 1, “Operating License Renewal,” Revision 1, issued June 2013 (ML13106A246), and Revision 2, issued August 2024 (ML23201A227). This guidance includes standard review plans that the staff uses when conducting environmental reviews of applications related to nuclear power plants, in accordance with NEPA and the NRC’s NEPA implementing regulations in 10 CFR Part 51.

#### IV. Advisory Committee on Reactor Safeguards Review

In its letter dated November 16, 2025, the ACRS concluded that its review supports issuance of the KU1 CP. The ACRS review focused on areas of the application identified as unique, novel, or noteworthy, including (1) control of heat generation, (2) control of heat removal, (3) retention of radionuclides, and (4) the adequacy of the overall safety case. The ACRS concluded that these areas were addressed sufficiently for the CP stage. However, consistent with the staff’s conclusions documented in the SE, the Committee noted that several complex and novel aspects will require further technical justification during the OL review.

The ACRS provided the following key conclusions and recommendations:

- (1) **Design Safety Features:** The Sodium sodium-cooled fast reactor (SFR) incorporates several inherent and engineered safety features that distinguish it from conventional LWRs, including low operating pressure, high thermal inertia, passive safety systems, two independent passive decay heat removal systems, diverse scram mechanisms, and enhanced separation between sodium and steam systems. These features support extended coping times without reliance on operator action or offsite power.
- (2) **Use of LMP Methodology:** The KU1 CP application is the first power reactor application to implement the LMP methodology. The ACRS considered the applicant’s implementation of this methodology to be acceptable for the CP stage and consistent with Commission policy on RIPB regulation for advanced reactors.
- (3) **Staff Safety Conclusion:** The NRC staff concluded that the facility can be constructed consistent with relevant regulations and the design bases outlined in the PSAR, and that detailed design and analysis will be completed before the OL application review. The ACRS agreed with the NRC staff’s assessment.
- (4) **Considerations for OL Review:** The “letter report identifies several areas that warrant special attention during review of the OL application, including implementation of the



functional containment approach, the system response to reactivity accidents, validation of the passive cooling design, completion of design features to prevent or mitigate sodium fires, seismic design, integration of the completed PRA and defense-in-depth assessments, evaluation of uncertainties, and quantification of safety margins.”

- (5) Recommendation: The ACRS concluded that its review supported the issuance of the CP for KU1.

## DISCUSSION:

### I. Excluded Matters

This paper does not discuss matters that will be addressed as part of a 10 CFR Part 50 OL application review. Under 10 CFR 50.35(b), a CP does not constitute Commission approval of the safety of any design feature or specification unless the applicant specifically requests such approval and such approval is included in the CP. Because USO did not request such approval, the staff did not make any findings on the safety of any 10 CFR Part 50 design feature or specification. The staff will evaluate the final design and specifications of KU1 as described in a final safety analysis report (FSAR) submitted as part of a 10 CFR Part 50 OL application, should USO apply for an OL.

### II. Exemptions from NRC Regulations

USO requested four exemptions from NRC regulations for the KU1 CP application. The staff granted three of these exemptions. The staff identified one exemption as applicable at the OL stage and therefore did not grant it in support of the CP. Additionally, the staff granted one exemption to USO on its own initiative.

The three exemptions requested by USO and granted by the staff are as follows:

- high-assay low-enriched uranium (HALEU) fuel (10 CFR 50.68, “Criticality accident requirements”)
- emergency core cooling system (ECCS) analysis (10 CFR 50.34(a)(4) and 10 CFR 50.34(b)(4))
- financial qualifications (10 CFR 50.33(f) and 10 CFR Part 50, Appendix C, “A Guide for the Financial Data and Related Information Required to Establish Financial Qualifications for Construction Permits and Combined Licenses”)

The staff evaluation of the HALEU and ECCS exemptions is provided in appendix B to the staff’s SE. The staff evaluation of the financial qualifications exemption is found in chapter 14 of the staff’s SE.

USO also requested an exemption from 10 CFR 50.65(b) to change the scope of the maintenance rule monitoring program to encompass SSCs identified as safety related (SR) or referred to as nonsafety related with special treatment (NSRST) following the process in NEI 18-04. The staff identified that since 10 CFR 50.65, “Requirements for monitoring the effectiveness of maintenance at nuclear power plants,” is applicable at the OL stage, it was not



necessary to grant this exemption in support of the CP. Should USO apply for an OL and include a similar exemption request in that application, the staff would consider such an exemption at that time.

The staff identified the need for a fourth additional exemption to enable the applicant to use the safety classification process described in NEI 18-04. Specifically, the staff initiated an exemption from certain substantive provisions applicable to CP applicants in 10 CFR Part 26, "Fitness for Duty Programs"; 10 CFR Part 50; and 10 CFR Part 73, "Physical Protection of Plants and Materials," to allow USO to apply the definition of SR SSCs from NEI 18-04. After issuing the final EIS, the NRC staff identified that this exemption required environmental analysis. The staff addresses this in the record of decision, where it concludes that consideration of this exemption would not affect the conclusions of the final EIS and that the environmental impacts of the exemption would continue to be encompassed by the analysis therein. The staff's safety evaluation of this exemption is provided in appendix B to the staff's SE.

### III. Nonroutine Matters, Unique Site Features, or Novel Issues

#### ***Safety Matters***

##### *First non-LWR power reactor construction permit in over 50 years*

If approved, the KU1 CP would be the first CP issued under 10 CFR Part 50 for a non-light-water commercial power reactor in over 50 years. Although the NRC recently issued CPs for non-LWR test reactors (i.e., Kairos Power's Hermes and Hermes 2, and Abilene Christian University's Molten Salt Research Reactor), these were nonpower facilities. Those reviews provided the NRC staff with valuable experience in applying 10 CFR Part 50 regulations to non-LWRs. However, many 10 CFR Part 50 requirements do not apply to nonpower reactor facilities but do specifically apply to power reactors such as KU1. In addition, certain requirements in 10 CFR Part 50 for power reactors are specific to LWRs (e.g., 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors"). Therefore, the NRC staff's review of the KU1 CP application considered a number of 10 CFR Part 50 requirements for power reactors that have not been addressed for a non-LWR in several decades. The NRC staff also plans to issue four exemptions, as discussed previously. As in the recent non-LWR nonpower reactor CP reviews, design-specific PDCs were established for KU1 in lieu of the general design criteria in Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50.

##### *Unique aspects of a sodium fast reactor*

KU1 is a pool-type SFR using metallic uranium-zirconium alloy fuel. Compared to LWRs, KU1 operates at very low pressure (near atmospheric in the primary system) and higher temperature. As a result of lower pressure system design, hazards from high-energy component failures are minimal. Therefore, coolant boundary components are primarily designed to address high-temperature effects such as material creep and can be thinner than LWR coolant boundary components. KU1 is designed for fully passive decay heat removal by establishing natural circulation within the primary system and rejecting heat through either the intermediate air cooling system or the reactor air cooling system. An important hazard in an SFR compared to LWRs is the potential for sodium reactions with air, water, or concrete, which can cause fires

and, in the case of activated primary sodium, release radionuclides. For this reason, KU1 systems containing sodium use an inert cover gas to control system pressure and prevent sodium fire, and the reactor vessel is surrounded by a guard vessel in case of reactor vessel leakage.

KU1 has similarities to several reactors that have operated previously. As a pool-type reactor, it is most similar to the Experimental Breeder Reactor II (EBR-II). Overall, the staff found that while most of KU1's key features have been demonstrated individually through prior operating experience, no single facility encompasses all of them. The staff's review was informed by SFR operating and licensing experience on key topics, including fuel design, events that could result in fuel damage, decay heat removal system design, and sodium-water reactions.

The KU1 design includes several important design features to reduce the probability of significant fuel damage. These features include the use of HALEU fuel with a softer neutron spectrum and other favorable neutronics characteristics, multiple mechanical primary coolant pumps to reduce the likelihood of a loss of forced coolant circulation and ensure transition to natural circulation for long-term core cooling, a highly reliable scram system to ensure reactor shutdown when needed, and a seismic isolation system to reduce seismic loading on the core. As a result of these design features and the inherent properties of sodium, transients that could lead to substantial fuel melt or even coolant boiling are at a low enough frequency that they are not included in the licensing basis under the RIPB methodology being used for the KU1 design. In addition, the KU1 design includes a diverse decay heat removal pathway through the intermediate air cooling system, by means of a set of air-cooled heat exchangers on the intermediate heat transport system loops, which provides important defense in depth not seen in prior SFR designs. The intermediate air cooling system is enabled in part by the use of a molten-salt secondary system, which, compared to previous designs, greatly reduces the risk of sodium-water reactions in the intermediate loop and provides separation between the reactor and the power conversion system.

In general, because of the robustness of the reactor design and safety features discussed above, the greatest areas of uncertainty and potential for failure are outside the primary system. Three particular hazards the staff reviewed for the CP are fuel handling events, sodium fire, and sodium-salt reactions. The KU1 design involves the transition of fuel from storage in sodium to water, which creates a potential for excessive sodium-water reactions that could lead to radionuclide releases if not controlled. Prior SFR experience has also shown that sodium fires can occur when sodium leaks and comes in contact with air. To mitigate the potential for sodium fires, the KU1 preliminary design includes prevention and mitigation features in many areas of the plant as well as a strong emphasis on leak detection. Finally, as discussed previously, the KU1 design includes a unique interface between sodium in the intermediate heat transport system and molten salt going to an energy island.<sup>3</sup> This boundary is safety significant, and USO plans to preclude the possibility of substantial sodium-salt reactions in the design of the sodium-salt heat exchangers (SHXs). The sodium-salt reaction and SHX design is identified as a research and development (R&D) item in the PSAR, and the staff proposes to include a condition in the CP to receive updates on R&D activities. For each of these unique hazards in

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<sup>3</sup> The KU1 energy island is the portion of the facility that contains power conversion equipment such as steam generators and turbines. Heat is supplied to the energy island through the molten salt system and stored in tanks to use for power generation. The energy island only contains equipment classified as nonsafety-related with no special treatment (NST) and is physically separated from the nuclear island. Because of this, the design of the energy island was only reviewed at a summary level by the staff in the CP application review. On September 9, 2024 (ML24253A023), TerraPower submitted an exemption request on behalf of USO related to the construction of the KU1 energy island. The staff issued the requested exemption on May 7, 2025 (ML25119A333).



the KU1 design, the NRC staff SE concludes that the information in the PSAR related to these hazards is sufficient, consistent with the applicable guidance, and meets the regulatory requirements for the issuance of a CP in accordance with 10 CFR 50.35 and 10 CFR 50.40.

*First implementation of a fully risk-informed, performance-based licensing basis*

The KU1 CP application marks the first use of a fully RIPB licensing basis for a power reactor reviewed by the NRC. This represents a major milestone in the NRC's transition to risk-informed regulation. The NRC staff is already applying lessons learned from the KU1 review to other ongoing RIPB application reviews and will continue to do so in future licensing efforts. As described earlier, the KU1 application used the LMP methodology from NEI 18-04 as endorsed in RG 1.233. The LMP methodology defines RIPB and technology-inclusive processes for defining the licensing basis, including event selection, safety classification of SSCs, and evaluation of defense-in-depth adequacy. Events are categorized by the frequency of occurrence, and LMP uses a frequency-consequence target curve to assess events, SSCs, and programmatic controls.

In its review, the staff used DANU-ISG-2022-01, which provides guidance for new non-LWR applications following the LMP methodology. DANU-ISG-2022-01 references RG 1.233 and RG 1.253 as well as other key guidance documents (e.g., NRC RGs and ISGs, endorsed consensus codes and standards), and it provides detailed guidance on applicability of regulations for non-LWRs and considerations for review of CP applications. As with prior non-LWR reviews, the staff also used its technical and engineering judgment to determine the acceptability of various novel design and technical topics consistent with the relevant guidance and requirements for a CP based on a preliminary design.

This first use of the RIPB LMP framework introduced several new aspects to the review, including the assurance of an adequate PRA for a preliminary design, a new safety classification category, and treatment of SSCs not typically modeled in a PRA. The CP PRA was based on preliminary design information and covered internal events at power and in low-power or shutdown conditions, which is consistent with RG 1.253. One particular insight from the CP PRA is the importance of fuel handling events, which represent the greatest risk for radionuclide release. The final PRA at the OL stage will address a broader suite of hazards, including seismic, internal fire, internal flooding, and high winds, that are not addressed in the CP PRA. In the absence of a completed seismic PRA (SPRA), the staff focused on evaluating the seismic classification process and design treatments based on potential consequences. This included assessing the impact of multiple failures from a seismic event and estimating unmitigated dose consequences. As a result of the seismic review, USO updated the seismic classification process and seismic treatments for NSRST SSCs and sodium-containing piping in Revision 1 of the PSAR to help ensure that performance targets would be met at the OL stage when the SPRA is available. The NRC staff determined in section 3.1 of the SE that the PRA is acceptable for supporting the preliminary KU1 safety analysis using the LMP process at the CP stage.

Another novel area of the review under LMP is a new category of SSCs referred to as non-safety-related with special treatment (NSRST). These SSCs are safety significant but not classified as SR under LMP. NSRST SSCs represent an intermediate category of SSCs between SR and non-SR. Generally, NSRST SSCs in KU1 will be designed and constructed to industrial codes and standards with additional design, construction, and programmatic special treatments provided to increase assurance that they will perform their safety functions under design-basis conditions. The staff reviewed the preliminary design of NSRST SSCs to confirm

that sufficient information was provided on design requirements, as well as applicable design and construction codes and standards, to ensure safety. The staff determined that the information in the CP application related to NSRST SSCs is sufficient, consistent with the applicable guidance, and meets the regulatory requirements for the issuance of a CP in accordance with 10 CFR 50.35 and 10 CFR 50.40.

Finally, the implementation of a fully RIPB approach involves the application of PRA to SSCs not typically modeled in a PRA. In operating reactors, PRA generally focuses on modeling active functions such as valves closing or opening or pumps starting or tripping off, with minimal modeling or consideration of passive components. However, in a fully RIPB design with primarily passive safety features, the PRA must consider passive component reliability (e.g., leakage, rupture, structural collapse). Relative to the traditional scope of PRA, the experience and technical basis for modeling passive component reliability in a PRA is more limited. KU1 is implementing the first reliability and integrity management (RIM) program to develop its approach to inservice inspection and monitoring and ensure passive component reliability consistent with the assumptions in the PRA. The staff reviewed the preliminary design information related to the RIM program and passive component reliability with a focus on assessing whether the approach provides a technically sound foundation to support the final design. The NRC staff determined that the information in the PSAR related to SSCs not typically modeled in a PRA is sufficient, consistent with the applicable guidance, and meets the regulatory requirements for the issuance of a CP in accordance with 10 CFR 50.35 and 10 CFR 50.40.

#### *Novel use of functional containment*

The KU1 design is the first commercial power reactor to use a functional containment strategy consistent with SECY-18-0096, "Functional Containment Performance Criteria for Non-Light-Water-Reactors," dated September 28, 2018 (ML18114A546), in which one or more barriers effectively retain radionuclides to limit transport of radioactive material to the environment. The staff has reviewed functional containment approaches for other recent preliminary designs for non-LWR nonpower reactors. In the approach described in SECY-18-0096, functional containment performance criteria are developed to address each barrier's role in mitigating releases to meet plant-level performance criteria (i.e., regulatory dose requirements). The NRC staff identified that the LMP methodology provides the necessary information to develop the functional containment performance criteria. Under the LMP process, mechanistic source term and radiological consequence analyses are used to determine offsite doses for licensing-basis events and thus evaluate the adequacy of functional containment barriers. Functional containment performance criteria are then used to inform reliability and capability targets, which are intended to ensure successful completion of PRA safety functions, including radionuclide retention.

The KU1 design uses a series of barriers to ensure functional containment for various radionuclide sources. For the reactor core, barriers include the fuel cladding, the primary coolant boundary, and a portion of the reactor building substructure above the reactor head known as the head access area. For potential releases from fuel handling and other ex-vessel radionuclide sources, there are other barriers credited for functional containment, such as transfer casks, storage tanks, process cells, ventilation systems, and building structures, depending on the event. The staff notes that the functional containment barriers generally include one or more SR barriers but also include credit for NSRST and NST barriers, consistent with the RIPB LMP methodology.



An important consideration in the staff's review of the KU1 functional containment is the low-pressure system design and absence of credible events leading to pressurization, which limits the driving force for radionuclide release compared to LWRs. The staff reviewed the preliminary mechanistic source term and radiological consequence analyses to evaluate the adequacy of the functional containment barriers and how they are credited for radionuclide retention based on reliability and capability targets to ensure successful completion of PRA safety functions. The NRC staff determined that the preliminary design information related to functional containment is consistent with the approach described in SECY-18-0096 and SRM-SECY-18-0096, dated December 4, 2018 (ML18338A502), and that it is consistent with the applicable guidance and meets the regulatory requirements for the issuance of a CP in accordance with 10 CFR 50.35 and 10 CFR 50.40.

### ***Environmental Matters***

The NRC staff issued the final EIS, NUREG-2268, in October 2025. The NHPA section 106 evaluation therein determined that the proposed undertaking would have no adverse effect on historic properties. The reason for this change from the initial determination of adverse effects on historic properties is outlined here.

### **Cultural resources**

On June 12, 2024, the NRC staff initiated an NHPA section 106 consultation with the Wyoming State Historic Preservation Office (WY SHPO) (ML24114A090). On September 17, 2024, the staff and applicant representatives met with the WY SHPO to discuss mitigation methods for potential adverse effects on historic sites 48LN740 and 48LN8940. On February 4, 2025, the staff notified the WY SHPO that it had determined that issuing the KU1 CP would result in adverse effects on historic properties, specifically, sites 48LN740 and 48LN8940, based on a Class III cultural resources report (ML25049A292) and consistent with 36 CFR 800.5, "Assessment of adverse effects." On February 12, 2025, the WY SHPO concurred that sites 48LN740 and 48LN8940 would be adversely affected by the undertaking as planned (ML25044A095) and recommended that the NRC staff develop a memorandum of agreement specifying the terms under which the adverse effects to the historic properties would be mitigated.

In early March 2025, TerraPower, on behalf of USO, notified the NRC of its intent to conduct additional archaeological testing to reinvestigate the site extent and eligibility and to determine whether adverse effects could be avoided at sites 48LN740 and 48LN8940 (ML25064A005). By letter dated March 24, 2025 (ML25073A136), the NRC requested WY SHPO concurrence on TerraPower's archaeological testing plan to further investigate sites 48LN740 and 48LN8940. The WY SHPO exchanged information with the NRC staff until agreement was reached before testing began. Additional archaeological testing was conducted at the KU1 site from April 28, 2025, to May 1, 2025, by TerraPower's cultural resources contractor, Tetra Tech, Inc., in accordance with "A Cultural Resource Testing Plan for Sites 48LN740 and 48LN8940 as part of TerraPower, LLC's Sodium Demonstration Project, Lincoln County, Wyoming," issued April 2025 (ML25195A006).

The purpose of the additional archaeological testing was to (1) determine the elements of sites 48LN740 and 48LN8940 that contribute to the sites' eligibility for inclusion in the National Register of Historic Places, (2) determine whether the current planned construction of KU1 would adversely affect those elements, and (3) if so, either make changes to the planned

construction to avoid those elements or develop the methodology to mitigate the potential adverse effects.

The resulting report, "Cultural Resource Testing Results for Sites 48LN470 and 48LN8940 as part of TerraPower, LLC's Natrium Demonstration Project, Lincoln County, Wyoming" (hereafter, the Testing Report), was sent to the WY SHPO and the NRC on July 1, 2025 (ML25182A007). Pursuant to 10 CFR 2.390, the testing report was withheld from public disclosure and may not be made publicly available. A publicly available version of this report, with sensitive archaeological resource information redacted, can be found at ML25195A007.

Given the additional archaeological testing and survey at sites 48LN740 and 48LN8940, the NRC staff determined that the proposed issuance of a CP for KU1 would have no adverse effect on the historic properties present at the KU1 site. The NRC staff made this revised determination based on the following considerations:

- the results of the additional archaeological testing as documented in the Testing Report
- USO's plan to modify the parking lot construction to avoid and buffer (with physical barriers) the contributing portions of site 48LN740
- USO's plan to move the utility corridor to avoid the contributing portions of site 48LN8940
- USO's commitment to integrate the avoidance and management of site 48LN740 into its overall environmental management policies for the facility

Consistent with 36 CFR 800.2(c)(2)(ii) and 36 CFR 800.8(c)(1), the NRC staff ensured that Indian Tribes that might attach religious and cultural significance to historic properties in the area of potential effects were afforded the opportunity to identify their concerns; provide advice on the identification and evaluation of historic properties, including those of traditional religious and cultural importance; and participate in the resolution of any adverse effects on such properties. In addition to sharing this same information with the consulting Indian Tribes, the NRC staff also held closed virtual meetings for Indian Tribes on August 6, 2025, and August 12, 2025.

The Tribes consulted generally indicated agreement with the findings. The WY SHPO concurred that the undertaking would not adversely affect sites 48LN740 and 48LN8940 by letter dated August 6, 2025 (ML25219A012), and consultations were subsequently closed. The NRC's flexibility late in the licensing process resulted in a more environmentally sound outcome and was well received by the Tribes and the WY SHPO.

#### IV. Construction Permit Findings

10 CFR 50.35(a) When an applicant has not supplied initially all of the technical information required to complete the application and support the issuance of a construction permit which approves all proposed design features, the Commission may issue a construction permit if the Commission finds that:

- (1) The applicant has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components



incorporated therein for the protection of the health and safety of the public.

The KU1 PSAR presents the proposed design of the facility, including the principal architectural and engineering criteria for the design (reflected by the PDC), features and components incorporated to protect public health and safety, the design bases of these features and components, and certain programmatic and administrative controls.

The staff evaluated the preliminary design to ensure the sufficiency of PDC, design bases, and information relative to materials of construction, general arrangement, and approximate dimensions. As part of its review of the preliminary design, the staff evaluated descriptions and discussions of the nuclear facility's SSCs, giving special attention to design and operating characteristics, unusual or novel design features, and principal safety considerations. Based on its evaluation, the staff concludes that the preliminary design is sufficient to provide assurance that the final design will conform to the design bases. In addition, the staff reviewed the identification and justification for the selection of variables, conditions, or other items that are probable subjects of technical specifications for KU1.

In safety areas for which the staff found that the information submitted initially was incomplete or insufficient to reach a conclusion, the staff conducted an audit. TerraPower, on behalf of USO, supplemented the PSAR and provided clarifications through timely responses to the staff's questions during audit meetings and in docketed correspondence. The staff documented the results of the audit in an audit report dated November 21, 2025 (ML25302A443).

The staff finds that the preliminary design and analysis of the KU1 facility are sufficient because they (1) provide assurance that the final design will conform to the design bases, (2) include an adequate margin of safety, (3) demonstrate that SSCs adequately provide for the prevention of accidents and the mitigation of consequences of accidents, and (4) meet all applicable regulatory requirements and acceptance criteria included or referenced. Notably, releases of radioactive material and waste from operation of the facility are expected to remain below the limits in Subpart D, "Radiation Dose Limits for Individual Members of the Public," to 10 CFR Part 20, "Standards for Protection Against Radiation." This supports the staff's conclusion that issuance of the CP will not be inimical to the common defense and security or to public health and safety. As discussed in chapter 1 of the staff's SE, the staff made its inimicality finding after determining that USO met all applicable regulations and acceptance criteria.

Based on its review, the staff concludes that USO has described the proposed design of the facility, including, but not limited to, the principal architectural and engineering criteria for the design, and has identified the major features or components incorporated therein for the protection of public health and safety in accordance with 10 CFR 50.35(a)(1). Thus, the staff concludes that USO has met the applicable standards and requirements of the AEA and the Commission's regulations.

#### 10 CFR 50.35(a)

- (2) Such further technical or design information as may be required to complete the safety analysis, and which can reasonably be left for later consideration, will be supplied in the final safety analysis report.

The staff evaluated the sufficiency of the preliminary design of the KU1 facility based on the USO design methodology and the applicant's ability to provide reasonable assurance that the

final design will conform to the design bases. Hence, the staff's evaluation of the KU1 preliminary design does not constitute approval of the safety of any design feature or specification. Such approval, if granted, would occur only after the staff completes an evaluation of the final design of the KU1 facility, as described in an FSAR submitted as part of an OL application.

Throughout the PSAR, and as confirmed in responses to audit questions, USO described the items for which an FSAR would provide further technical or design information.

Based on its review of the application, the staff concludes that USO has demonstrated that further technical or design information can reasonably be left for later consideration in the FSAR in accordance with 10 CFR 50.35(a)(2). Thus, the staff concludes that USO has met the applicable standards and requirements of the AEA and the Commission's regulations.

10 CFR 50.35(a)

- (3) Safety features or components, if any, which require research and development have been described by the applicant and the applicant has identified, and there will be conducted, a research and development program reasonably designed to resolve any safety questions associated with such features or components.

As described in KU1 PSAR chapter 13.0, USO identified several R&D activities:

1. Reactor Air Cooling Heat Transfer Performance
2. In-Vessel Fuel Handling System In-Vessel Transfer Machine Grapple Finger Operation
3. Intermediate Heat Transfer (IHT) SHX Interaction
4. Core Restraint System Compressive Assembly
5. Verification and Validation Testing
6. In-Service Structural Materials Performance
7. Coatings Development, Application, and Qualification

In support of these activities, USO has described the affected SSCs and the remaining work to be performed. The staff evaluated these R&D activities in chapter 13 of its SE.

Based on its review of the KU1 CP application, the staff concludes that USO has described safety features and components that require R&D in accordance with 10 CFR 50.35(a)(3). Furthermore, USO has demonstrated that it will conduct an R&D program reasonably designed to resolve any safety questions.

Based on its review, the staff proposes that the CP should include six conditions, including three related to R&D activities. First, although the USO application addresses geotechnical evaluations, additional information is needed to confirm that the bedrock does not show fracturing or other geologic conditions that could affect the KU1 facility. Accordingly, as described in section 2.6 of the staff's SE, the staff proposes to include a condition in the CP requiring USO to perform detailed geologic mapping of excavations for SR engineered structures and reporting on the excavations. A similar condition has been included in other recent CPs. Second, a critical aspect of the LMP process is the integrated decision-making process to evaluate the safety analysis and risk assessment of the final KU1 design as



evaluated in section 4.3 of the staff's SE. The NRC staff proposes to include a condition in the CP that USO notify the NRC when an integrated decision-making process panel has convened, so that the NRC has the opportunity to examine the supporting documentation.

Because currently key positions within the USO organization are serving the same role within TerraPower and are not clearly delineated in the PSAR, the NRC staff also proposes to include a condition requiring USO, before the start of construction, to clearly establish and document within the PSAR person(s) responsible for overseeing the execution of the Quality Assurance Program Description (QAPD). The person(s) and organizations performing quality assurance functions shall have sufficient authority and organizational freedom to make decisions related to QAPD implementation, sufficiently independent of cost or schedule considerations, including responsibility for overseeing and ensuring the implementation of audit findings. The person(s) shall not be assigned responsibilities that would challenge the function of assuring that an appropriate quality assurance program is established and effectively executed. The staff is including this condition to support its finding that USO meets the requirements of Criterion I, "Organization," to Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50.

The remaining three proposed CP conditions are associated with R&D activities and are discussed in detail in sections 13.1.1.4 and 13.1.1.7 of the staff's SE. USO identified an R&D item associated with potential interactions between sodium and salt in the IHT SHXs to improve the understanding of sodium-salt reactions and identify how the SHX design should be modified to prevent and mitigate such reactions. Because of the R&D activities and the conceptual stage of the SHX design provided in the CP application, the NRC staff proposes including a condition in the CP requiring USO to submit annual reports detailing progress, results, and plans related to this R&D effort. Additionally, USO identified an R&D item associated with ensuring adequate inservice structural materials performance for safety-significant SSCs included in the RIM program. Given the ongoing R&D work to ensure inservice materials performance through the RIM program, the staff proposes to include two conditions in the CP associated with this R&D item. The first proposed condition requires USO to submit annual reports covering the latest results and plans for R&D for inservice materials performance through the RIM program. The second proposed condition is tied specifically to the degradation mechanism assessment (DMA) for environmental compatibility of safety-significant SSCs. The condition requires USO to submit a report with a complete DMA for the RIM program by the end of calendar year 2026.

The draft CP includes these six conditions, which are also listed in appendix A to the staff's SE. These conditions are confirmatory in nature, since they do not require evaluation by the staff for the staff to make its findings with respect to the issuance of the CP.

Thus, the staff concludes that USO meets the applicable standards and requirements of the AEA and the Commission's regulations.

#### 10 CFR 50.35(a)

- (4) On the basis of the foregoing, there is reasonable assurance that,
  - (i) such safety questions will be satisfactorily resolved at or before the latest date stated in the application for completion of construction of the proposed facility.

According to a letter dated December 9, 2025 (ML25343A199), the latest projected date for completion of construction is expected to be February 28, 2031. PSAR chapter 13 states that each of the identified R&D activities is expected to be completed before the completion of construction.

Based on its review of the KU1 CP application, the staff concludes that there is reasonable assurance that USO will satisfactorily resolve the safety questions at or before the latest date for the completion of construction of the nuclear facility. Thus, the staff concludes that the applicable standards and requirements of the AEA and the Commission's regulations have been met.

10 CFR 50.35(a)

- (4) On the basis of the foregoing, there is reasonable assurance that...
  - (ii) taking into consideration the site criteria contained in Part 100 of this chapter, the proposed facility can be constructed and operated at the proposed location without undue risk to the health and safety of the public.

The staff evaluated the facility's site-specific conditions considering the site criteria in 10 CFR Part 100, "Reactor Site Criteria," to verify that issuance of the CP will not be inimical to the common defense and security or to public health and safety. Chapter 2 of the staff's SE evaluated the geography and demography of the site; nearby industrial, transportation, and military facilities; site meteorology; site hydrology; and site geology, seismology, and geotechnical engineering, to ensure that issuance of the CP will not be inimical to public health and safety. The staff also evaluated SSCs and equipment designed to ensure safe operation, performance, and shutdown when subjected to extreme weather, floods, seismic events, missiles (including aircraft impacts), chemical and radiological releases, and loss of offsite power.

As discussed in chapter 3 of its SE, the staff's review confirmed that radiological consequences of potential accidents will be consistent with the criteria in 10 CFR 50.34(a)(1) and 10 CFR Part 100. Thus, the staff concludes that the issuance of the CP will not be inimical to public health and safety.

The staff's review of the USO preliminary emergency planning information concluded that the preliminary emergency plan meets the requirements in 10 CFR 50.34(a)(10)(ii) and is consistent with the performance-based framework emergency preparedness requirements of 10 CFR 50.160(b)(1). Therefore, as discussed in section 11.3 of the staff's SE, the preliminary plan is acceptable and supports the staff's conclusion that issuance of the CP will not be inimical to the common defense and security or to public health and safety.

Based on its review of the application, as discussed in this paper and in the referenced documents, the staff concludes that there is reasonable assurance that the proposed facility can be constructed and operated at the proposed location without undue risk to public health and safety. The staff also concludes that the provisions of the AEA and the Commission's regulations have been met. In some cases, the staff's finding required the inclusion of conditions in the CP, specifically the six conditions previously discussed. The draft CP lists these six conditions.

10 CFR 51.105(a) In addition to complying with applicable requirements of § 51.104, in a proceeding for the issuance of a construction permit or early site permit for a nuclear power reactor, testing facility, fuel reprocessing plant or isotopic enrichment plant, the presiding officer will:

- (1) Determine whether the requirements of Sections 102(2) (A), (C), and (E) of NEPA and the regulations in this subpart [Subpart A, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," of 10 CFR Part 51] have been met.

The staff reviewed the KU1 CP application and evaluated it against the applicable regulations in 10 CFR Parts 50, 51, and 100. The staff performed this evaluation using DANU-ISG-2022-01, which provides guidance for the staff review of new non-LWR applications following the LMP methodology. As appropriate, the staff used additional guidance (e.g., NRC RGs, Institute of Electrical and Electronics Engineers standards, and American National Standards Institute / American Nuclear Society standards) in its review of the KU1 CP application.

In accordance with NEPA section 102(2)(A) (42 U.S.C. § 4332(2)(A)), the staff prepared the final EIS based on its independent assessment of the information provided by the applicant and information developed independently by the staff, including through consultation with local, State, and other Federal agencies and federally recognized Indian Tribes. The staff's technical analysis used a systematic, interdisciplinary approach to integrate information from many fields, including the natural and social sciences. Additionally, in accordance with NEPA section 102(2)(E) (42 U.S.C. § 4332(2)(E)), the staff's analysis made use of reliable data and resources.

In accordance with NEPA sections 102(2)(C)(i-v) (42 U.S.C. § 4332(2)(C)(i-v)), the final EIS for the KU1 CP addresses (1) the reasonably foreseeable environmental effects of the proposed action, (2) any reasonably foreseeable unavoidable adverse environmental effects, (3) a reasonable range of alternatives to the proposed action that are technically and economically feasible and meet the purpose and need of the proposed action, as well as the no-action alternative, (4) the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, and (5) any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

Section 3.7 and appendices B and C of the final EIS serve as the administrative record of the NRC's compliance with and consultation under NHPA section 106. They reference correspondence and publicly available summaries related to the staff's interactions with the Advisory Council on Historic Preservation, the WY SHPO, and federally recognized Indian Tribes during the environmental review. The staff engaged in government-to-government consultations with federally recognized Indian Tribes. The final EIS provides documentation of the status of the consultations and the process used for consultation closure; therefore, the staff concludes that it has fulfilled the requirements of NEPA section 102(2)(C), in part, by engaging in consultation with and obtaining comments from other Federal, State, and local agencies with jurisdiction by law or special expertise. The staff also filed both the draft and final EIS with the U.S. Environmental Protection Agency, furnished them to commenting agencies, and made them available to the public.

Consistent with NEPA and the NRC's regulations that implement NEPA (10 CFR Part 51), the final EIS evaluated the potential environmental impacts of constructing, operating, and



decommissioning KU1 at the KU1 site and the environmental impacts of a reasonable range of alternatives to the proposed action, which was determined to consist of the no-action alternative and building KU1 at two alternative sites. The staff determined that the direct, indirect, and cumulative impacts from constructing, operating, and decommissioning KU1 at the KU1 site would be small for all resource areas except for socioeconomic, historic and cultural resources, and terrestrial ecological resources. Under the no-action alternative, none of the environmental effects associated with the NRC's authorization of the construction of KU1 would occur; however, the proposed site would remain available for other government or private industrial development projects, and many of the environmental impacts resulting from land disturbance and building new industrial facilities on the site might still occur at some time in the future. Additionally, the no-action alternative does not satisfy the purpose and need of the proposed action. For the two alternative sites, the impacts for many resource areas would be similar to those of the proposed action. Specifically, construction at either alternative site would require the disturbance of soils containing surface and subsurface archaeological resources and would generate several types of taxes benefiting the socioeconomic profile of the area; thus, it would have a moderate to large impact to those resource areas. In addition, construction at one of the alternative sites would require filling a wetland and relocating an intermittent stream, thereby potentially affecting water and aquatic resources and causing a moderate to large impact to those resource areas. After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff recommended that the NRC issue the requested KU1 CP unless safety issues mandate otherwise.

For the reasons given above, the staff concludes that its review meets the NRC's requirements in 10 CFR Part 51, Subpart A. The staff concludes that the environmental findings in the final EIS constitute the "hard look" required by NEPA and have reasonable support in logic and fact.

#### 10 CFR 51.105(a)(2)

- (2) Independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken.

Section 4.3 of the final EIS provides the summary of the cost-benefit assessment, and table 4-1 compares the environmental impacts to each resource area for the proposed action, the no-action alternative, and the two alternative sites. Based on this analysis, the staff concluded that there are no environmentally preferable alternatives to the proposed action that meet the purpose and need for the proposed action and that constructing, operating, and decommissioning KU1 would have accrued benefits that would outweigh the economic, environmental, and social costs, regardless of whether the project is sited at the KU1 site or at one of the two alternative sites.

#### 10 CFR 51.105(a)(3)

- (3) Determine, after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, whether the construction permit... should be issued, denied, or appropriately conditioned to protect environmental values.

Section 6.4 of the final EIS states that after weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff recommends that the NRC issue the requested CP to USO unless safety issues mandate otherwise. This recommendation is based on (1) the KU1 ER submitted as part of the CP application, information gathered during the environmental audit, and responses to requests for clarifying information, (2) the staff's consultation with Federal, State, and local agencies and federally recognized Indian Tribes, (3) the staff's independent review, (4) the staff's consideration of public scoping comments related to the environmental review, (5) the staff's consideration of public comments on the draft EIS, and (6) the assessments summarized in the final EIS, including the potential mitigation measures identified.

10 CFR 51.105(a) (4)

- (4) Determine, in an uncontested proceeding, whether the NEPA review conducted by the NRC staff has been adequate.

The staff conducted an independent evaluation of the application; made use of reliable data and resources; and conducted a systematic interdisciplinary review of the potential impacts of the proposed action on the human environment and of reasonable alternatives to the proposed action. Before developing the draft EIS, the staff issued a notice of intent and invited the public to provide any information relevant to the environmental review. The staff also provided opportunities for governmental and general public participation during the public meeting on the draft EIS.

The staff considered the purpose and need for the proposed action, the environment that could be affected by the action, and the impacts of the proposed action, including mitigation that could reduce impacts. The final EIS considered the no-action alternative and alternative sites. The final EIS compared the impacts of the alternatives to those of the proposed action. The staff considered any adverse environmental effects that could not be avoided should the proposed action be implemented, the relationship between local short-term uses of the human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the proposed action.

The staff filed the draft EIS with the U.S. Environmental Protection Agency for its review consistent with the requirements of section 309 of the Clean Air Act (42 U.S.C. § 7609). The staff considered all comments received on the draft EIS and, in appendix H to the final EIS, described the manner in which comments were dispositioned.

On these bases, the staff concludes that, for the purpose of issuing the CP, it conducted a thorough and complete environmental review that was sufficient to meet the requirements of NEPA and the NRC's regulations and was adequate to inform the Commission's action on the KU1 CP application.

CONCLUSION:

Based on the findings of its review in accordance with 10 CFR 50.35(a) and 10 CFR 51.105, the staff concludes that there is sufficient information for the Commission to issue the subject CP to

USO, as guided by the following considerations described in 10 CFR 50.40 and 10 CFR 50.50, and as described in chapter 1 of the staff's SE for the KU1 application:

1. There is reasonable assurance (1) that the construction of KU1 will not endanger public health and safety, and (2) that construction activities can be conducted in compliance with the Commission's regulations.
2. USO is technically qualified to engage in the design and construction of its proposed facility in accordance with the Commission's regulations.
3. USO is financially qualified to engage in the construction of its proposed facility in accordance with the Commission's regulations.
4. The issuance of a permit for the construction of the facility would not be inimical to the common defense and security or to public health and safety.
5. After weighing the environmental, economic, technical, and other benefits of the proposed action against environmental and other costs and considering reasonable alternatives, the staff concludes that the issuance of the CP, subject to the conditions for protection of the environment set forth therein, is in accordance with Subpart A of 10 CFR Part 51, and all applicable requirements have been satisfied.
6. The application meets the standards and requirements of the AEA and the Commission's regulations, and notifications, if any, to other agencies or bodies have been duly made.

COORDINATION:

The Office of the General Counsel provided advice as outlined above on the review and has no legal objection to this paper.



Michael F. King  
Acting Executive Director  
for Operations

Enclosures:

1. Construction Permit for the USO  
Kemmerer Power Station, Unit 1 (non public)
2. Record of Decision for Construction Permit  
Application for the Proposed USO Kemmerer  
Power Station, Unit 1 (non public)
3. Issuance of Construction Permit for  
USO Kemmerer Power Station Unit 1 (non public)



SUBJECT: STAFF'S STATEMENT IN SUPPORT OF THE UNCONTESTED HEARING FOR  
ISSUANCE OF A CONSTRUCTION PERMIT FOR THE USO KEMMERER POWER  
STATION UNIT 1 DATED: December 18, 2025

**ADAMS Accession Nos.: Pkg: ML25324A368, SECY: ML25324A372, Encl 1:  
ML25324A371, Encl 2: ML25324A373, Encl 3: ML25324A374**

<b>OFFICE</b>	NRR/DANU/UAL1/ PM*	NMSS/REFS/EPMB3/PM	QTE*	NRR/DANU/UAL1/LA*
<b>NAME</b>	MSutton	PVokoun	KAzariah-Kribbs	DGreene
<b>DATE</b>	12/15/2025	12/15/2025	12/15/2025	10/27/2025
<b>OFFICE</b>	NMSS/REFS/ERN RB/BC	NRR/DANU/UAL1/BC*	NRR/DANU/UTB 2/BC*	OGC*
<b>NAME</b>	DBarnhurst	JBorromeo	CDeMessieres	Mary Spencer
<b>DATE</b>	12/15/2025	12/15/2025	12/15/2025	12/16/2025
<b>OFFICE</b>	NRR/DANU/D*	NMSS/REFS/D*	NRR/D*	EDO*
<b>NAME</b>	JGreives	KSavoy	JBowen	MKing
<b>DATE</b>	12/16/2025	12/16/2025	12/17/2025	12/18/25

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