



## **NUCLEAR REGULATORY COMMISSION**

**[Docket Nos. 50-611 and 50-612; NRC-2023-0138]**

### **Kairos Power, LLC; Hermes 2; Draft Environmental Assessment and Draft Finding of No Significant Impact**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Notice of availability and request for comment.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is issuing for public comment a draft environmental assessment (EA) and draft finding of no significant impact (FONSI) for proposed issuance of construction permits (CP) to Kairos Power, LLC (Kairos). The CPs would authorize the construction of two non-power test reactors termed Hermes 2, adjacent to the Hermes test reactor (Hermes), on a 185-acre site located in Oak Ridge, Tennessee. Kairos was issued a CP for Hermes, Construction Permit No. CPTR-6, on December 14, 2023. The Hermes 2 test reactors would demonstrate additional key elements of the Kairos Power Fluoride Salt-Cooled, High Temperature Reactor technology for possible future commercial deployment. The technology is an advanced nuclear reactor technology that leverages TRI-structural ISotropic (TRISO) particle fuel in pebble form combined with a low-pressure fluoride salt coolant. The NRC has prepared a draft EA and draft FONSI that consider the environmental impacts associated with issuing the CPs.

**DATES:** Submit comments by **[INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practicable to do so, but the NRC is able to ensure consideration only for comments received before this date.

**ADDRESSES:** You may submit comments by using any of the following methods; however, the NRC encourages electronic comment submission through the **Federal rulemaking website:**

- **Federal rulemaking website:** Go to <https://regulations.gov> and search for Docket ID NRC-2023-0138. Address questions about Docket IDs in Regulations.gov to Stacy Schumann; telephone: 301-415-0624; email: [Stacy.Schumann@nrc.gov](mailto:Stacy.Schumann@nrc.gov). For technical questions, contact the individual listed in the “**FOR FURTHER INFORMATION CONTACT**” section of this document.

- **Email:** Comments may be submitted to the NRC electronically using the email address: [Kairos-Hermes2Environmental@nrc.gov](mailto:Kairos-Hermes2Environmental@nrc.gov).

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing Staff.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the **SUPPLEMENTARY INFORMATION** section of this document.

**FOR FURTHER INFORMATION CONTACT:** Peyton Doub, telephone: 301-415-6703, email: [Peyton.Doub@nrc.gov](mailto:Peyton.Doub@nrc.gov) and Mary Richmond, telephone: 301-415-7218, email: [Mary.Richmond@nrc.gov](mailto:Mary.Richmond@nrc.gov). Both are staff of the Office of Nuclear Material Safety and Safeguards at the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

## **SUPPLEMENTARY INFORMATION:**

### **I. Obtaining Information and Submitting Comments**

#### **A. Obtaining Information**

Please refer to Docket ID NRC-2023-0138 when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- **Federal Rulemaking Website:** Go to <https://regulations.gov> and search for Docket ID NRC-2023-0138.

- **NRC’s Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/adams.html>. To begin the

search, select “Begin Web-based ADAMS Search.” For problems with ADAMS, please contact the NRC’s Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov). For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the “Availability of Documents” section.

- **NRC’s PDR:** The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

- **NRC’s Public Project Website:** The draft EA and draft FONSI can be accessed online at the Hermes 2—Kairos project specific web page at <https://www.nrc.gov/reactors/non-power/new-facility-licensing/hermes2-kairos.html>.

#### A. Submitting Comments

The NRC encourages electronic comment submission through any of the methods outlined in **ADDRESSES** section of this document. Please include Docket ID **NRC-2023-0138** in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

## II. Introduction

On July 14, 2023, Kairos submitted, pursuant to part 50 of title 10 of the *Code of Federal Regulations* (10 CFR), “Domestic Licensing of Production and Utilization Facilities,” an application for CPs for the Hermes 2 test reactor facility (a “testing facility” as defined in 10 CFR 50.2), that would consist of two fluoride salt-cooled test reactor units at the East Tennessee Technology Park in Oak Ridge, Tennessee. A notice of receipt and availability of the application was published in the *Federal Register* on August 4, 2023 (88 FR 51876). The Hermes 2 site, adjacent to the Hermes test reactor, is situated in the Heritage Center Industrial Park of the East Tennessee Technology Park that was established by the City of Oak Ridge on land formerly owned by the U.S. Department of Energy (DOE) for the Oak Ridge Gaseous Diffusion Plant (ORGD). The site was occupied by DOE Buildings K-31 and K-33, both of which were part of the ORGD.

The NRC staff determined that Kairos submitted the application in accordance with 10 CFR 2.101(a)(5), and a notice of the acceptability of docketing of Kairos's CP application was published in the *Federal Register* on September 15, 2023 (88 FR 63632). The docket numbers established for this application are 50-611 and 50-612 for Units 1 and 2, respectively. A notice of opportunity to request a hearing and petition for leave to intervene (88 FR 81439) was published in the *Federal Register* on November 22, 2023.

Section 104 of the Atomic Energy Act of 1954, as amended, and its implementing regulations authorize the NRC to issue CPs for testing facilities. 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 (NEPA). The NRC’s environmental protection regulations that implement NEPA in 10 CFR part 51 identify actions for which the NRC prepares an environmental impact statement (EIS). CPs for test reactors are an action identified as requiring an EIS.

However, based on a review of the environmental report (ER) submitted as part of the CP application for Hermes 2 and the results of the EIS recently issued for the Hermes test reactor, the NRC staff concluded that it would be prudent to first prepare a draft environmental assessment (EA) to determine whether preparation of an EIS would be necessary or whether a finding of no significant impact (FONSI) could be issued for the Hermes 2 CP based on factors unique to the Hermes 2 CP application. These factors include: (1) the similar design of Hermes 2 and Hermes, (2) the proposed siting of Hermes 2 within a few hundred feet of Hermes, (3) the industrial nature and heavy prior disturbance of the site, (4) the recent thorough NEPA review performed by the staff as published in its final EIS for Hermes, and (5) the staff's final EIS for Hermes covering the same site as Hermes 2 and documenting all impacts as SMALL.

The NRC staff has prepared a draft EA and draft FONSI documenting its environmental review of the Hermes 2 CP application. Based on the environmental review, the NRC staff has made a preliminary determination that the proposed action would not significantly affect the quality of the human environment. Therefore, the NRC staff has made a preliminary determination that it will not prepare an EIS and that a draft FONSI appears warranted.

The staff will consider comments received on the draft EA and draft FONSI over a 30-day public comment period from Federal, State, local, and Tribal officials, and members of the public. After consideration of these public comments, the NRC staff will make a final determination as to whether preparation of an EIS is necessary or whether a FONSI can be issued for the Hermes 2 CP application. However, exemptions from certain regulations in 10 CFR part 51 would be necessary to issue a final EA and final FONSI to support issuance of the Hermes 2 CPs. In accordance with 10 CFR 51.6, the NRC may grant exemptions from the requirements of 10 CFR part 51 if it determines that the exemptions are authorized by law and are otherwise in the public interest.

### **III. Summary of Draft Environmental Assessment**

#### *Description of the Proposed Action and Need*

The proposed action is for the NRC to issue CPs to Kairos authorizing construction of the two proposed Hermes 2 reactors. The NRC issuance of CPs would constitute authorization for Kairos to proceed with the construction of the Hermes 2 reactors, two fluoride salt-cooled test reactor units, at the East Tennessee Technology Park in Oak Ridge, Tennessee.

The issuance of a CP is a separate licensing action from the issuance of an operating license (OL). If the NRC issues CPs for Hermes 2 and Kairos were to seek NRC approval to operate Hermes 2, then Kairos would have to submit a separate application for OLs pursuant to the NRC's regulations, and Kairos would have to obtain NRC approval before it could operate the Hermes 2 test reactors. The NRC staff would review any application for an OL for Hermes 2 for new and significant information related to the environmental impacts of operating and decommissioning Hermes 2 that might alter the staff's conclusions made in the EA for the CP application.

The need for Hermes 2 is to demonstrate key elements of the Kairos Power Fluoride Salt-Cooled, High Temperature Reactor technology for possible future commercial deployment. The technology is an advanced nuclear reactor technology that leverages TRI-structural ISOtropic particle fuel in pebble form combined with a low-pressure fluoride salt coolant. Hermes 2 would support Kairos's reactor development program, which relies on learning and risk reduction by narrowing the design space through progressive test cycles. Construction and operation of Hermes 2 also would provide validation and qualification data to support potential future commercial reactors using the Kairos Power Fluoride Salt-Cooled, High Temperature Reactor technology.

#### *Environmental Impacts of the Proposed Action*

In the draft EA, the NRC staff assessed the potential direct and indirect environmental impacts from the proposed action associated with the following relevant resource areas: land use and visual resources; air quality and noise; hydrogeology and water resources; ecological resources; historic and cultural resources; socioeconomics and environmental justice; human health; nonradiological waste management; uranium

fuel cycle and radiological waste management; transportation of radioactive material; and postulated accidents. The NRC staff also considered the cumulative impacts from past, present, and reasonably foreseeable future actions when combined with the proposed action.

The NRC staff determined that the environmental impacts of the proposed action would be SMALL for each potentially affected environmental resource, meaning that the environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. In addition, the NRC staff determined that the projected effects of climate change would not alter any of the impact determinations described in the EA. Furthermore, the NRC staff found that there would be no significant negative cumulative impact to any resource area from the proposed action when added to other past, present, and reasonably foreseeable future actions.

#### *Environmental Impacts of the Alternatives to the Proposed Action*

The NRC staff identified a range of reasonable alternatives to the proposed action and the environmental impacts of the alternatives as appropriate. The NRC staff determined that there are no alternatives that meet the need for the proposed action and that are environmentally preferable to the proposed action.

#### **IV. Draft Finding of No Significant Impact**

The proposed action before the NRC is whether to issue CPs (one for each unit) to Kairos to authorize construction of the two proposed reactors (units) making up the Hermes 2 project. The NRC has conducted an environmental review of a request for NRC issuance of CPs for the Hermes 2 project and prepared an EA. This draft FONSI incorporates by reference the EA summarized in Section II of this notice and referenced in Section V of this notice. On the basis of the EA, and its determination that the environmental impacts would be SMALL for each potentially affected resource area, the NRC staff has preliminarily determined that the proposed action would not have a significant effect on the quality of the human environment. Accordingly, the NRC staff

has made a preliminary determination that preparation of an EIS is not required for the proposed action and that a FONSI is appears warranted.

This finding and the related environmental documents referenced throughout the EA are available for public inspection as discussed in the EA and Section I of this notice. The NRC's staff's determination is tentative. Before making a final determination, the NRC staff also will consider comments received on the draft EA and draft FONSI over a 30-day public comment period from Federal, State, local, and Tribal officials, and members of the public. Once NRC makes a final determination, it will publish the final EA and final FONSI or proceed to prepare an EIS.

#### **V. Availability of Documents**

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

<b>Document Description</b>	<b>ADAMS Accession No./Federal Register Notice (FRN)</b>
Environmental Assessment and Finding of No Significant Impact for the Construction Permits for the Kairos Hermes 2 Test Reactors, Draft Report for Comment, dated April 2024.	ML24103A002
Letter to NRC from Kairos, Responses to Requests for Confirmatory Information for the Environmental Report, dated March 4, 2024.	ML24065A100 (Package)
Letters to NRC from Kairos, Responses to General Audit Questions, dated October 27, 2023.	ML23300A141 (Package) and ML23300A144
FRN: Kairos Power LLC Hermes 2- Construction Permit Application; Opportunity to Request a Hearing and Petition for Leave to Intervene, dated November 22, 2023.	88 FR 81439
FRN: Acceptance for docketing of the Kairos Power LLC Hermes 2 Test Reactor Construction Permit, dated September 15, 2023.	88 FR 63632
FRN: Receipt and Availability. Hermes 2 Receipt of Application, August 4, 2023.	88 FR 51876
Letter to NRC from Kairos, Submittal of the Construction Permit Application for the Hermes 2 Kairos Power Fluoride Salt-Cooled, High Temperature Non-Power Reactor, dated July 14, 2023.	ML23195A121 (Package)
Kairos Power LLC - Construction Permit for Hermes Test Reactor, dated December 14, 2023.	ML23338A258
NUREG-2263, Environmental Impact Statement for the Construction Permit for the Kairos Hermes Test Reactor, Final Report, dated August 2023.	ML23214A269

Dated: April 22, 2024.

For the Nuclear Regulatory Commission.

**Daniel Barnhurst,**

*Chief,*

*Environmental Project Management Branch 3,*

*Division of Rulemaking, Environmental, and Financial Support,*

*Office of Nuclear Material Safety, and Safeguards.*

[FR Doc. 2024-08964 Filed: 4/25/2024 8:45 am; Publication Date: 4/26/2024]