

October 27, 2023

Docket No. 50-0611

Docket No. 50-0612

US Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: Kairos Power LLC  
Kairos Power Response to Hermes 2 General Audit Question 1.5-2

- References:
1. Letter, Kairos Power LLC to Document Control Desk, "Submittal of the Preliminary Safety Analysis Report for the Hermes 2 Kairos Power Fluoride Salt-Cooled, High Temperature Non-Power Reactor (Hermes 2), Revision 0," July 14, 2023 (ML23195A122)
  2. Audit Plan, Nuclear Regulatory Commission, "Kairos Power LLC – Plan for a General Audit of the Hermes 2 Construction Permit Application," October 3, 2023 (ML23268A446)
  3. Email, Nuclear Regulatory Commission, Samuel Cuadrado de Jesus to Darrell Gardner and Drew Peebles, "General and Accident Analysis Audit Reports-Hermes Construction Permit PSAR (Docket Number 05007513)," June 9, 2023 (ML23160A287)
  4. Email, Nuclear Regulatory Commission, Matthew Hiser to Drew Peebles and Darrell Gardner, "Hermes Audit Reports," April 25, 2023 (ML23115A480)

In July 2023, Kairos Power submitted a Preliminary Safety Analysis Report (PSAR) (Reference 1) as part of the Construction Permit Application (CPA) for the Hermes 2 test reactor. This letter transmits a response to NRC Question 1.5-2 from the Hermes 2 general audit (Reference 2) regarding the applicability of Hermes CPA audit reports to the Hermes 2 CPA. Kairos Power requests NRC review of the response in support of continued review of the Hermes 2 test reactor construction permit application.

Kairos Power reviewed the Hermes PSAR audit reports (References 3 and 4) to determine their applicability to the Hermes 2 CPA. Kairos Power's review of the audit reports included consideration of the Kairos Power internal documents provided for NRC audit, internal meeting note summaries of discussions between the NRC and Kairos, and Kairos Power notes regarding responses to audit questions. As part of this review effort, the prior Hermes audit responses were considered applicable to Hermes 2 if the general conclusion that was drawn from the response remained the same. For example, a response that committed to Hermes CPA changes was considered applicable to the Hermes 2 CPA if that content remained valid for the Hermes 2 design and was provided in the Hermes 2 CPA.

The documents that the NRC staff identified as audited and the summaries of discussions in each audit report were found to be applicable to the Hermes 2 CPA. Kairos Power considers the responses to audit questions in References 3 and 4 to be applicable to Hermes 2 with the exception of two questions in the General Audit, which require additional clarification:

**Kairos Power LLC**

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- Hermes General Audit Question 1.3.9-1 – The NRC staff conclusion in Reference 3 that the research and development activities identified in PSAR Chapter 1 will be completed by the completion of construction is applicable to Hermes 2; however, the anticipated date for completion of construction for Hermes 2 is December 2027 as described in Enclosure 1 of Reference 1.
- Hermes General Audit Question 9.6-2 – The NRC staff question for Hermes identified text that referred to tritium in the secondary coolant. Kairos subsequently removed this text from the Hermes CPA after the secondary coolant loop was removed from the design prior to completion of the Hermes CPA review. While removal of the text was appropriate for the Hermes design, the Hermes 2 design does include a secondary coolant loop; therefore the cited text is included in the Hermes 2 CPA.

If you have any questions or need any additional information, please contact Nicole Schlichting at [schlichting@kairospower.com](mailto:schlichting@kairospower.com) or (980) 215-9252, or Darrell Gardner at [gardner@kairospower.com](mailto:gardner@kairospower.com) or (704) 769-1226.

I declare under penalty of perjury that the foregoing is true and correct.  
Executed on October 27, 2023



Peter Hastings, PE  
Vice President, Regulatory Affairs and Quality

Enclosure:     None

cc:

William Jessup, Chief, NRR Advanced Reactor Licensing Branch  
Michael Orenak, Project Manager, NRR Advanced Reactor Licensing Branch  
Matthew Hiser, Project Manager, NRR Advanced Reactor Licensing Branch  
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