

February 18, 2022

Docket No. 50-7513

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

Subject: Kairos Power LLC  
Transmittal of Kairos Power CPA Changes

- References:
1. Letter, Kairos Power LLC to Document Control Desk, "Submittal of the Preliminary Safety Analysis Report for the Kairos Power Fluoride Salt-Cooled, High Temperature Non-Power Reactor (Hermes)," September 29, 2021 (ML21272A376)
  2. Letter, Kairos Power LLC to Document Control Desk, "Submittal of the Environmental Report for the Kairos Power Fluoride Salt-Cooled, High Temperature Non-Power Reactor (Hermes)," October 31, 2021 (ML21306A131)
  3. Kairos Power LLC to Document Control Desk, "Metallic Materials Qualification for the Kairos Power Fluoride Salt-Cooled High Temperature Reactor," KP-TR-013, Revision 0, June 30, 2020 (ML20182A800)
  4. Kairos Power LLC to Document Control Desk, " Graphite Material Qualification for the Kairos Power Fluoride Salt-Cooled High-Temperature Reactor," KP-TR-014, Revision 1, July 8, 2021 (ML21190A220)

In September and October 2021, Kairos Power submitted a Construction Permit Application (CPA) for the Hermes non-power reactor, including a Preliminary Safety Analysis Report (PSAR) (Reference 1) and an Environmental Report (ER) (Reference 2). Subsequent to the submittal of these documents, Kairos Power made a decision to eliminate the intermediate nitrate salt coolant loop and remove primary system heat directly through an air heat rejection subsystem. This change has a negligible impact on the conclusions of the CPA but has a minor effect on content in several chapters of the PSAR, the ER, and the Postulated Event Analysis Methodology Technical Report (KP-TR-018, which was also submitted in Reference 1).

Changes to the pages of the PSAR, ER, and Technical Report affected by this decision are provided in Enclosures 1, 2, and 3, respectively. A small number of minor changes unrelated to the revised heat removal strategy are also included in these enclosures. Kairos Power requests NRC review of these changes as part of continued review of the Hermes CPA.

This change also impacts two topical reports referenced in the CPA that are currently under review by NRC staff, KP-TR-013 (Reference 3) and KP-TR-014 (Reference 4). Kairos Power will provide updates to these reports as part of changes to these documents that are occurring as part of the review process.

**Kairos Power LLC**

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If you have any questions or need any additional information, please contact Drew Peebles at [peebles@kairospower.com](mailto:peebles@kairospower.com) or at (704) 275-5388 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 February 18, 2022



Peter Hastings, PE

Vice President, Regulatory Affairs and Quality

Enclosures:

- 1) Changes to the PSAR
- 2) Changes to the ER
- 3) Changes to the Postulated Event Technical Report

xc (w/enclosure):

William Kennedy, Acting Chief, NRR, Advanced Reactor Licensing Branch  
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**Enclosure 1**  
**Changes to the PSAR**  
**(Non-Proprietary)**

**Enclosure 2**  
**Changes to the ER**  
**(Non-Proprietary)**

**Enclosure 3**

**Changes to the Postulated Event Technical Report  
(Non-Proprietary)**