

April 3, 2024

Project No. 99902069

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

Subject: Kairos Power LLC
Core Design and Analysis Methodology for the Kairos Power Fluoride Salt-Cooled
High Temperature Reactor

References: 1. Letter, Kairos Power LLC to Document Control Desk, "Presentation Materials for Kairos Power Pre-Submittal Meeting on the Criticality Safety Analysis Methodology for the Hermes Non-Power Reactor and the KP-FHR Core Design Methodology Topical Report," February 15, 2024 (ML24046A143)

This letter submits the subject topical report, which provides the core design methodology for the Kairos Power Fluoride Salt-Cooled, High Temperature Reactor (KP-FHR). This topical report is provided for NRC review and approval and is expected to be referenced by future KP-FHR non-power and power reactor operating license applications.

On February 20, 2024, Kairos Power met with NRC staff to discuss the materials in Reference 1. Kairos considered feedback provided by the NRC staff during the meeting and implemented changes where appropriate. Kairos Power respectfully requests NRC acceptance review of the topical report to be completed and a review schedule provided within 60 days of the receipt of the letter. Kairos Power respectfully requests a review schedule supporting approval of the topical report within 12 months after acceptance.

Portions of the topical report are considered proprietary, and Kairos Power requests those portions be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390. Enclosure 1 provides the proprietary version of the topical report and Enclosure 2 provides the non-proprietary topical report. An affidavit supporting the withholding request is provided in Enclosure 3. Additionally, the information indicated as proprietary has also been determined to contain Export Controlled Information. This information must be protected from disclosure pursuant to the requirements of 10 CFR 810.

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

Sincerely,



Peter Hastings, PE
Vice President, Regulatory Affairs and Quality

Kairos Power LLC
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Enclosures:

- 1) KP-FHR Core Design and Analysis Methodology Topical Report (Proprietary)
- 2) KP-FHR Core Design and Analysis Methodology Topical Report (Non-Proprietary)
- 3) Kairos Power LLC Affidavit Supporting Request for Withholding from Public Disclosure (10 CFR 2.390)

xc (w/enclosure):

William Jessup, Chief, NRR Advanced Reactor Licensing Branch
Cayetano Santos, Project Manager, NRR Advanced Reactor Licensing Branch
Matthew Hiser, Project Manager, NRR Advanced Reactor Licensing Branch
Michael Orenak, Project Manager, NRR Advanced Reactor Licensing Branch
Edward Helvenston, Project Manager, NRR Advanced Reactor Licensing Branch
Brian Bettes, Project Manager, NRR Advanced Reactor Licensing Branch

Enclosure 3

**Kairos Power LLC Affidavit and Request for
Withholding from Public Disclosure (10 CFR 2.390)**

I, Peter Hastings, hereby state:

1. I am Vice President, Regulatory Affairs and Quality, at Kairos Power LLC ("Kairos"), and as such I have been authorized by Kairos to review information sought to be withheld from public disclosure in connection with the development, testing, licensing, and deployment of the Kairos reactor and its associated structures, systems, and components, and to apply for its withholding from public disclosure on behalf of Kairos.
2. The information sought to be withheld, in its entirety, is contained in Kairos' Enclosure 1 to this letter.
3. I am making this request for withholding, and executing this affidavit in support thereof, pursuant to the provisions of 10 CFR 2.390(b)(1).
4. I have personal knowledge of the criteria and procedures utilized by Kairos in designating information as a trade secret, privileged, or as confidential commercial or financial information. Some examples of information Kairos considers proprietary and eligible for withholding under §2.390(a)(4) include:
 - a. Information which discloses process, method, or apparatus, including supporting data and analyses, where prevention of its use by Kairos competitors without license or contract from Kairos constitutes a competitive economic advantage over other companies in the industry;
 - b. Information, which if used by a competitor, would reduce his expenditure of resources or improve his competitive position in design, manufacture, shipment, installation, assurance of quality;
 - c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of Kairos, its customers, its partners, or its suppliers;
 - d. Information which reveals aspects of past, present, or future Kairos or customer funded development plans or programs, of potential commercial value to Kairos;
 - e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection; and/or
 - f. Information obtained through Kairos actions which could reveal additional insights into reactor system development, testing, qualification processes, and/or regulatory proceedings, and which are not otherwise readily obtainable by a competitor.
5. Kairos' information contained in Enclosure 1 to this letter contains details of Kairos' core design methodology for a Kairos Power fluoride salt-cooled high-temperature reactor. These details could provide a competitor with a commercial advantage if the information were to be revealed publicly.

6. Pursuant to the provisions of §2.390(b)(4), the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld:
- a. The information sought to be withheld from public disclosure is owned and has been held in confidence by Kairos.
 - b. The information is of a type customarily held in confidence by Kairos and not customarily disclosed to the public. Kairos has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Kairos policy and provide the rational basis required.
 - c. The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR 2.390, it is to be received in confidence by the Commission.
 - d. This information is not readily available in public sources.
 - e. Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Kairos, because it would enhance the ability of competitors to provide similar products and services by reducing their expenditure of resources using similar project methods, equipment, testing approach, contractors, or licensing approaches. This information is the result of considerable expense to Kairos and has great value in that it will assist Kairos in providing products and services to new, expanding markets not currently served by the company.
 - f. The information could reveal or could be used to infer price information, cost information, budget levels, or commercial strategies of Kairos.
 - g. Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Kairos of a competitive advantage.
 - h. Unrestricted disclosure would jeopardize the position of Kairos in the world market, and thereby give a market advantage to the competition in those countries.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: April 3, 2024

A handwritten signature in black ink, appearing to read "Peter Hastings", is written over a horizontal line.

Peter Hastings
Vice President, Regulatory Affairs and Quality