Kairos Power

KP-NRC-2202-006

February 3, 2022

Docket No. 50-7513

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

Subject: Kairos Power LLC
Transmittal of Responses to NRC Questions 2.3-1 and 2.3-2 on the Hermes Preliminary Safety Analysis Report

This letter transmits the resopnses to NRC Questions 2.3-1 and 2.3-2 on the Hermes Preliminary Safety Analysis Report received on January 10, 2022. The responses include data files that are provided on the enclosed CD-ROM.

The data on the enclosed CD-ROM is considered proprietary, and Kairos Power requests that the data be withheld from public disclosure in its entirety in accordance with the provisions of 10 CFR 2.390. Enclosure 1 provides the non-proprietary portion of the responses and Enclosure 2 provides the CD-ROM containing proprietary data. 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 Drew Peebles at peebles@kairospower.com or (704) 275-5388, or Darrell Gardner at gardner@kairospower.com or (704) 769-1226.

I declare under penalty of perjury that the foregoing is true and correct. Executed on February 3, 2022.

Peter Hastings, PE
Vice President, Regulatory Affairs and Quality

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NRR

Enclosures:

1) Responses to NRC Questions 2.3-1 and 2.3-2 on the Hermes Preliminary Safety Analysis Report (Non-Proprietary)
2) CD-ROM with Data Referenced in Responses (Proprietary)
3) Affidavit Supporting Request for Withholding from Public Disclosure (10 CFR 2.390)

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xc (w/enclosure):

William Kennedy, Chief, Advanced Reactor and Licensing Branch
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Enclosure 1

Responses to NRC Questions 2.3-1 and 2.3-2 on the Hermes Preliminary Safety Analysis Report

(Non-Proprietary)

Kairos Power

Question Number: 2.3-1
Please submit the representative hourly meteorological data referenced in Section 2.3.3 so that it can be docketed along with the application. This should be provided in a text file in Regulatory Guide 1.23 format by email, optical disk or other mode. Please coordinate with a project manager on the mode used.

Kairos Power Response:
As stated in Section 2.3.3 of the Hermes Preliminary Safety Analysis Report, meteorological data was sourced from the Oak Ridge Reservation Tower L and is available online at https://metweb.ornl.gov/page5.htm. Regulatory Guide 1.23 is not directly applicable to non-power reactors, so not all meteorological parameters specified in the regulatory guide were used to generate input to the dispersion calculation. The meteorological parameters provided with this response include:

- Wind speed in mph at lower measurement level (15m) and upper measurement level (30m)
- Wind direction in degrees at lower measurement level (15m) and upper measurement level (30m)
- Temperature difference of the upper and lower measurement levels in °C

Consistent with guidance in Regulatory Guide 1.23, the meteorological data enclosed with this response is provided in ASCII text data files. However, only the meteorology data used to produce inputs for ARCON96 is provided, as described above (that source information is publicly available via the online link indicated above; the selection of data for input is part of the proprietary content in Enclosure 2). The data provided are in the units used in ARCON96, and may deviate from the units listed in RG 1.23 (e.g., wind speed is provided in mph instead of m/s). Other information not used (e.g., ambient temperature, atmospheric moisture, etc.) are provided as 99999.

Impact on Licensing Document:

This response has no impact on the content of the Hermes Preliminary Safety Analysis Report.

Kairos Power

Question Number: 2.3-2
In Section 2.3.4 Kairos states that the short-term dispersion modelling uses ARCON96 with the atmospheric dispersion methodology as outlined in the KP-FHR mechanistic source term topical report. NRC staff requests that Kairos provide the site-specific inputs and assumptions used to run the ARCON96 model and provide the ARCON96 input and output files.

Kairos Power Response:
As stated in Section 2.3.4 of the Hermes Preliminary Safety Analysis Report (PSAR), the short-term dispersion modeling uses the methodology outlined in the KP-FHR Mechanistic Source Term Methodology Topical Report (Reference 1), which details the assumptions applied to the inputs used in ARCON96. The site-specific inputs are provided in the ARCON96 input files enclosed with this response. The ARCON96 output files are also enclosed with this response.

After the submittal of the Hermes PSAR, an error was identified in the formatting of the ARCON96 met data input. There needs to be 2 blank spaces after the stability class input in the met data input. Only one blank space was used in the Hermes ARCON96 met data input. Another error was also identified where the met data files were not listed in chronological order in the ARCON96 run specification file. A condition report was filed as part of the Kairos Power Corrective Action Program. A review of the condition concluded that the effect on the ultimate figure of merit (dose consequence) is expected to be negligible. As a result of the corrective action, the dispersion calculation will be updated in a future revision of the calculation but is not concluded to materially affect the Hermes PSAR.

Impact on Licensing Document:

This response has no impact on the content of the Hermes Preliminary Safety Analysis Report.

References:

1. Kairos Power, LLC, "KP-FHR Mechanistic Source Term Methodology," KP-TR-012-P, Revision 1.

Enclosure 2

CD-ROM with Data Referenced in Responses

(Proprietary)

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 2 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 2 to this letter contains details of Kairos' input and output data used in site-specific dispersion calculations 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.

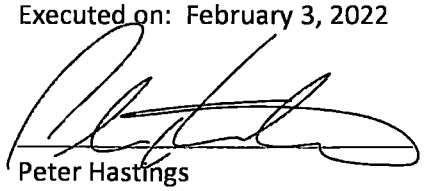
   f. The information could reveal or could be used to infer price information, cost information, budget levels, or commercial strategies of Kairos.

   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: February 3, 2022



Peter Hastings
Vice President, Regulatory Affairs and Quality