



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
WASHINGTON, D.C. 20555-0001

June 9, 2021

**KAIROS POWER, LLC – HERMES TEST REACTOR POSTULATED EVENTS AUDIT PLAN  
(CAC/EPID NO. 000431/99902069/L-2018-LRM-0071)**

**APPLICANT INFORMATION**

**Applicant:** Kairos Power LLC

**Applicant Address:** 707 W. Tower Ave, Alameda, CA 94501

**Plant Name(s) and Unit(s):** Kairos – Hermes Test Reactor

**Project No(s).:** 99902069

**Background:**

Kairos Power LLC (Kairos) began pre-application discussions with the U.S. Nuclear Regulatory Commission (NRC) staff on their Kairos Power Fluoride-Salt-Cooled, High-Temperature Reactor (KP-FHR) in October 2018. In December of 2020, Kairos announced that the Hermes test reactor would be used to support future development of the KP-FHR. Over the past several years, Kairos has submitted several topical and technical reports that apply to both the Hermes as well as the full-scale KP-FHR reactor. As discussed in meetings held on January 27, 2021 and March 3, 2021, Kairos plans to submit a Hermes Part 50 construction permit (CP) and corresponding preliminary safety evaluation (PSAR). A key reference in the preliminary safety evaluation will be the Transient Methodology technical report which will provide the specific internal events and associated analysis methodology for the Hermes design. It is expected that Kairos will submit this report at the same time they submit their PSAR. The contents of the Transient Methodology report are expected to align with that given in NUREG-1537, Chapter 13 including any design specific events. The events to be evaluated in the report should be derived from a systemic approach to event identification which the staff is requesting to audit.

**Purpose:**

The purpose of this audit is for the NRC staff to gain a better understanding of Kairos's systematic event identification process and the resulting proposed postulated events to be evaluated in the Transient Methodology technical report. Also, the staff would like to enhance its understanding of how defense-in-depth against potential radiological releases is incorporated into the Hermes test reactor design and corresponding analyses including the Maximum Hypothetical Accident. Therefore, the staff is requesting access to internal documents associated with event identification and the resulting events analyzed as part of the Transient Methodology technical report. In addition, the staff is requesting any relevant documents associated with the Hermes reactor design defense-in-depth evaluation or considerations.

### **Regulatory Audit Basis:**

The bases for the audit are the regulations of Title 10 of the *Code of Federal Regulations*, 50.34(a)(1)(ii)(D) and 50.34(a)(4).

### **Regulatory Audit Scope**

This audit will focus on information provided by Kairos on the online reference portal.

### **Information and Other Material Necessary for the Regulatory Audit**

Documents associated with event identification, analysis methodology, and defense-in-depth considerations associated with the Hermes test reactor.

### **Team Assignments**

Jeff Schmidt	Sr. Reactor Systems Engineer, NRR/DANU/UART, Audit Lead responsible for audit summary report preparation
Boyce Travis	Technical staff, NRR/DANU/UART
Jason Schaperow	Technical staff, NRR/DANU/UART
Michelle Hart	Technical staff, NRR/DANU/UART (as needed)
Alexander Chereskin	Technical staff, NRR/DANU/UART (as needed)
Stewart Magruder	Project Manager, NRR/DANU/UARL, responsible for audit logistics
Ed Helvenston	Project Manager, NRR/DANU/UNPL

Additional audit team members may be added as needed.

### **Logistics**

Entrance Meeting	June 9, 2021
Exit Meeting	July 30, 2021, or earlier, Time TBD

Audit meetings take place in a virtual format, using Microsoft Teams, or via other, similar platform. Audit meetings will be scheduled on an as needed basis after the entrance meeting and once the NRC staff has had the opportunity to review any documents placed in the online reference portal. The audit duration is anticipated to be approximately 6 weeks with activities occurring intermittently during that period.

### **Special Requests**

None.

### **Deliverables**

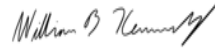
At the completion of the audit, the audit team will issue an audit summary within 90 days after the exit meeting but will strive for a shorter duration. The audit summary will be declared and entered as an official agency record in the NRC's Agencywide Documents Access and Management System (ADAMS) and be made available for public viewing through the publicly available records component of ADAMS.

### **References**

Title 10 of the *Code of Federal Regulations*.

If necessary, any issues related to the conduct of the audit should be communicated to Stewart Magruder (NRC) at 301-348-5766 or by email at [stewart.magruder@nrc.gov](mailto:stewart.magruder@nrc.gov).

Date: June 9, 2021



Signed by Kennedy, William  
on 06/09/21

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William Kennedy, Acting Chief  
Advanced Reactor Licensing Branch  
Division of Advanced Reactors and Non-Power  
Production and Utilization Facilities  
Office of Nuclear Reactor Regulation

**SUBJECT: KAIROS POWER LLC – HERMES TEST REACTOR POSTULATED  
EVENTSAUDIT PLAN (CAC/EPID NO. 000431/99902069/L-2018-LRM-0071)  
DATED JUNE 9, 2021**

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**ADAMS Accession No.: ML21147A547 Audit Plan**

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OFFICE	NRR/DANU/UART/BC	NRR/DANU/UARL/BC	
NAME	MHayes	WKennedy	
DATE	06/09/2021	06/09/2021	

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