

KP-NRC-2409-005

Enclosure

**Presentation Slides for the September 27, 2024 Pre-submittal Meeting Regarding Kairos Power's
Operator Training and Testing Program for KP-FHR Test Reactors Topical Report
(Non-Proprietary)**




Kairos Power

Operator Training and Testing Program for
KP-FHR Test Reactor Topical Report

NRC PRE-SUBMITTAL MEETING

SEPTEMBER 27TH, 2024



Kairos Power's mission is to enable the world's transition to clean energy, with the ultimate goal of dramatically improving people's quality of life while protecting the environment.

In order to achieve this mission, we must prioritize our efforts to focus on a clean energy technology that is *affordable* and *safe*.

Purpose

- The purpose of this meeting is to obtain NRC feedback on Kairos Power's operator training and testing strategy prior to submitting the Hermes OLA.
- The Kairos Power operator training and testing program will be described in a topical report and require an exemption from 10 CFR 55.40(d).

Operator Training and Testing Regulations

- The operator training and testing program is subject to the rules in 10 CFR 55, “Operators’ Licenses.”
 - This includes Medical Requirements (Subpart C), Applications (Subpart D), Written Examinations and Operating Tests (Subpart E), and License (Subpart F).
 - The regulations in 10 CFR 55.46 outline the requirements for a Commission-approved simulator.
- The topical report will demonstrate how the testing and training program meets the requirements in 10 CFR 55, but requires an exemption from portions of 10 CFR 55.40(d) to self-administer the operating examinations.
 - 10 CFR 55.40(d) states “The Commission shall use the criteria in NUREG–1478, "Operator Licensing Examiner Standards for Research and Test Reactors," for all test and research reactors to prepare, proctor, and grade the written examinations required by §§ 55.41 and 55.43 and the operating tests required by § 55.45 for non-power reactor facility licensees.”

Exemption Request

- Kairos Power will request NRC approval of an exemption from portions of 10 CFR 55.40(d) for KP-FHR non-power reactors. These portions include:
 - (1) The “Commission shall” prepare, proctor, and grade the written examinations and operating tests.
 - Kairos Power will prepare, proctor, and grade both the written examination required by 10 CFR 55.41 and 10 CFR 55.43 and the operating test required by 10 CFR 55.45 for non-power test reactors licensed and operated by Kairos Power.
 - (2) Select portions of “the criteria in NUREG-1478.”
 - The Kairos Power Operator Training and Testing Program applies the principles of NUREG-1478 for the administration of the written examinations and operating tests.
 - The only departures from the guidance in NUREG-1478 is to transfer responsibilities performed by the NRC chief examiner to the facility license’s qualified examiner(s).
 - Specifically, the responsibility to prepare, proctor and grade the written examinations and operating tests

Exemption Request (continued)

- Background
 - Underlying purpose of the rule
 - 1999 Rule Change
- The exemption request will meet 10 CFR 55.11
 - “The Commission may, upon application by an interested person, or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are **authorized by law** and **will not endanger life or property** and are otherwise **in the public interest.**”
- Justification for Exemption
 - Authorized by law
 - Does not endanger life or property
 - Public interest
- Environmental Considerations

Topical Report Outline

- Introduction
- Initial Operator Training and Testing Program
 - Initial candidate selection, training, medical examination, license application, and testing processes
 - New facility Operator Licensing Plan
- Operator Training Requalification Program
 - Continued training, medical examination, and renewal applications
 - Change in Operator License Status
- Simulator Facility
 - Simulator description, examination integrity, performance testing, and configuration management
- Appendix A – Departures
 - NUREG-1478, Rev. 2, “Operator Licensing and Examiner Standards for Research and Test Reactors.”
 - ANSI/ANS – 3.5 -2018 “Nuclear Power Plant Simulators for Use in Operator Training and Examination.”

Topical Report - Introduction

- Design Features
 - Design Background
 - Key Design Features of the KP-FHR
- Regulatory Information
 - Facility applicants under 10 CFR 50 must include an operator requalification program, in compliance with 10 CFR 55, Operators' Licenses.
 - Non-power KP-FHRs require an exemption from 10 CFR 55.40(d) to allow use of the operator training and testing programs in this report.
- Regulatory Ask
 - Kairos Power is requesting NRC review and approval of the operator training and testing programs in the report for use by non-power KP-FHRs, in accordance with 10 CFR 55.
 - Kairos Power is also requesting review and approval of a Commission-approved simulator facility for use by non-power KP-FHRs, in accordance with 10 CFR 55.

Topical Report - Initial Licensed Operator Training and Testing Program

- Responsibilities
- Initial License Candidate Selection
- Initial Training
- Medical Examination and Fitness for Duty
- Initial Licensing Application
- Initial License Examination
- New Facility Operator Licensing Plan
- Records

Topical Report - Licensed Operator Requalification Program

- Responsibilities
- Continued Training and Requalification
- Medical Examination and Fitness for Duty
- Change in Operator License Status
- Licensed Operator Renewal Application
- Records

Topical Report - Simulation Facility

- Description of Simulator
- Simulator Performance Testing
- Simulator Examination Integrity
- Simulator Configuration Management

Appendix A. Table A-1 Departures from NUREG-1478

- Examiner Standard | Applicability | Justification | Topical Report Reference Section
- Applicability Assignments
 - N/A – the examiner standard is not applicable to the Kairos Power training and testing program
 - e.g., the “Purpose” sections of the Examiner Standards provides extraneous information already covered in the topical report.
 - Partial – Portions of the examiner standard are applicable to the Kairos Power training and testing program
 - e.g., ES-201N Assignment of Examiner, is specific to NRC staff assignment as examiners. Kairos Power partially uses the relevant selection processes for internal examiner assignment.
 - Full - the examiner standard is fully applicable to the Kairos Power training and testing program
 - This includes items that are fully applicable to Kairos Power but are not Kairos Power activities (i.e., NRC internal process, such as review of license applications).

Appendix A. Table A-2 Departures from ANS/ANSI 3.5-2018

- Criteria Number | Applicability | Justification
- Applicability Assignments
 - N/A – the examiner standard is not applicable to the Kairos Power training and testing program
 - e.g., LWR technology specific testing criteria.
 - Partial – Portions of the examiner standard are applicable to the Kairos Power training and testing program
 - e.g., Criteria 4.4.1 Steady-state testing has some applicable general guidelines but also specific PWR and BWR criteria.
 - Full - the examiner standard is fully applicable to the Kairos Power training and testing program

Next Steps

- Kairos Power plans to submit the topical report and the exemption request for NRC review late Q4 2024.
 - Kairos Power will have another pre-submittal meeting with the staff prior to submitting.
- Kairos Power requests the staff provide any feedback on the strategy outlined within the next week.