

Enclosure 2
Exemption Request to Portions of 10 CFR 55.40(d)
(Non-Proprietary)

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1 BACKGROUND

Kairos Power LLC (Kairos Power) requests an exemption from certain requirements of 10 CFR 55.40(d). The current regulation would require the Nuclear Regulatory Commission (NRC or Commission) to prepare, proctor, and grade written examinations and operating tests for licensed operator applicants for non-power reactors. The requested exemption would allow the Hermes and Hermes 2 facilities (Facility), rather than the Commission, to prepare, proctor, and grade those examinations and tests.

The underlying purpose of this requirement is for the regulator to “establish uniform conditions” across all applicants for testing, consistent with the Atomic Energy Act of 1954, as amended (AEA) (Reference 1). The regulations in 10 CFR Part 55 were amended in 1999 to allow power reactor applicants the ability to prepare, proctor, and grade written examinations as well as prepare (but not proctor or grade) operating tests (Reference 2). In its statement of consideration for the final rule, the Commission did not include an allowance for non-power reactor licensees to prepare, proctor, or grade their own tests because “the nonpower reactor community does not have an accreditation process for training and qualification or the resources to prepare the examinations” (Reference 2).

During this same 1999 rule change, 10 CFR 55.40(b) did not include allowance for power reactors to proctor and grade their own operating tests because of the perceived lack of independence that scenario would create between the examiner and operator applicant (Reference 3). The NRC staff cited an article in the Washington Post regarding the public perception associated with independence (Reference 3). The NRC staff considered public perception that the staff would be “in a weaker position to judge the performance of the applicant” if the facility licensee were to proctor and grade the operating test to their “coworkers and friends” (Reference 3).

Both the generic resource considerations that prevented the Commission from granting non-power reactor licensees the same flexibility as power reactor licensees, and the generic independence considerations that weighed against permitting power reactor licensees to proctor or grade operating tests, are not necessarily applicable to the Facility. First, the uniformity of the operator training and testing program (i.e., prescriptive requirements for preparing, proctoring and grading) is confirmed by NRC approval of the operator training and testing program in lieu of private accreditation to maintain uniformity across non-power KP-FHRs. This approval would ensure an appropriate level of independence in the preparing, proctoring, and grading process for the Facility. Second, a Facility that has the resources to develop an NRC-approved program would have sufficient resources to establish a testing program with uniform conditions, unlike the research and test reactor licensees considered in the 1999 rulemaking.

KP-FHR technology has a simple, automated operating interface; and relies on passive safety design features that results in reduced reliance on operators when compared to the current operating LWR fleet. This reduced reliance on operators results in KP-FHRs being characterized as self-reliant mitigation facilities. While NRC staff have considered the concept of self-reliant mitigation facilities as part of their draft 10 CFR 53 rulemaking, Kairos Power defines this concept for KP-FHRs as:

1. KP-FHRs do not rely on operator actions to mitigate the consequences of postulated events to ensure that the dose at the site boundary meets regulatory limits.

2. The KP-FHR plant designed response to postulated events relies on safety features and characteristics that will perform their safety function independent of credible human errors of commission or omission and do not require manual human operation in response to equipment failures.
3. The KP-FHR design relies on functional containment, which includes multiple barriers, to prevent the release of radioactive material at risk for release. The primary functional containment barriers are the coating layers of the TRISO fuel, and the secondary functional containment barrier is the reactor coolant. The inherent design features that support the functional containment approach include a near-atmospheric operating pressure, a robust fuel form with radionuclide retention capabilities in transient conditions, and a primary coolant design with a high boiling point that is operated at near-atmospheric pressures preventing energetic releases. These design features do not rely on operator actions and will perform their safety function independent of credible commission or omission of operator actions.

2 REGULATORY REQUIREMENT

The regulation in 10 CFR 55.40(d) requires that the Commission prepares, proctors, and grades the written examinations and operating tests for all non-power reactors:

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.

3 EXEMPTION SOUGHT

Consistent with 10 CFR 55.11, Kairos Power requests NRC approval of an exemption from portions of 10 CFR 55.40(d), specifically the requirements of (1) the "Commission shall" prepare, proctor, and grade the written examinations and operating tests and (2) select portions of "the criteria in NUREG-1478."

As a result of this exemption:

1. The Facility will prepare, proctor, and grade both the written examinations required by 10 CFR 55.41 and 10 CFR 55.43 and the operating test required by 10 CFR 55.45.
2. The Facility will prepare, proctor, and grade written examinations and operating tests using an NRC-approved operator training and testing program. The NRC approval of the operator training and testing program ensures that the program is consistent with the principles of NUREG-1478 for the administration of the written examinations and operating tests.

4 JUSTIFICATION FOR EXEMPTION

The exemption requirements for operator licenses under 10 CFR 55 regulations are specified in 10 CFR 55.11 and allow the NRC to:

...[G]rant such exemptions from the requirements of the regulations in this part as it determines are [A.] authorized by law and [B.] will not endanger life or property and [C.] are otherwise in the public interest.

- A. The requested exemption is authorized by law

The Atomic Energy Act of 1954, as amended, requires the Commission to:

- a. prescribe uniform conditions for licensing individuals as operators of any of the various classes of production and utilization facilities licensed in this Act;*
- b. determine the qualifications of such individuals;*
- c. issue licenses to such individuals in such form as the Commission may prescribe; and*
- d. suspend such licenses for violations of any provision of this Act or any rule or regulation issued thereunder whenever the Commission deems such action desirable.*

The requested exemption would not affect the NRC's authority to prescribe uniform testing conditions because NRC approves the operator testing and training program that the Facility examiners will use to evaluate the approved operator applicants.

The requested exemption would not affect the NRC's authority to determine operator qualifications because NRC approves the operator testing and training program that determine the qualifications and NRC will review and approve operator license applications submitted by the Facility.

The requested exemption would not affect the NRC's authority to review and issue licenses.

Importantly, the AEA neither prescribes nor limits the entity responsible for preparing, proctoring, and grading operator license examinations. Rather, the AEA leaves that choice to the discretion of the Commission. Therefore, the requested exemption is authorized by law.

B. The requested exemption will not endanger life or property

As a self-reliant mitigation facility, a KP-FHR relies on passive safety features that are independent of operator interactions (including acts of commission or omission) to mitigate the consequences of postulated events. With the reduced reliance on operators, a change in the entity responsible for administering the operating examinations would not endanger life or property.

An operator training and testing program, reviewed and approved by the NRC, will supply the necessary level of uniformity and independence for the self-administration of operating examinations. Additionally, the requested exemption would not affect the NRC's authority to approve and issue operator licenses. The requested exemption would not materially affect the assurance that the operator applicants are capable of operating the Facility. Therefore, this requested exemption would not endanger life or property.

C. The requested exemption is in the public interest

Non-power KP-FHRs are a key part in the iterative development and deployment of KP-FHR technology. The commercialization of KP-FHR technology will deliver a clean, affordable, and safe energy solution. Kairos Power has an aggressive commercialization timeline to deploy KP-FHRs. Since the requirements in 10 CFR 55.40(d) do not allow non-power reactors to self-administer operator licensing examinations, the Facility would need to rely on the availability of the NRC Research and Test Reactor division and its resources to schedule and administer the operator licensing examinations. Benchmarking discussions with other non-power reactors concluded that in many cases, it is a burden to schedule examinations for non-power reactors due to the availability of NRC Research and Test Reactor division proctors. In the

ADVANCE Act of 2024, Title V “Improving Commission Efficiency,” Congress mandated the Commission to update the mission statement to include:

...that licensing and regulation of the civilian use of radioactive materials and nuclear energy be conducted in a manner that is efficient and does not unnecessarily limit – (1) the civilian use of radioactive materials and deployment of nuclear energy; or (2) the benefits of civilian use of radioactive materials and nuclear energy technology to society (Reference 4).

In response to Congress, the NRC updated their mission statement to “enable” the deployment nuclear technology:

The NRC protects public health and safety and advances the nation’s common defense and security by enabling the safe and secure use and deployment of civilian nuclear energy technologies and radioactive materials through efficient and reliable licensing, oversight, and regulation for the benefit of society and the environment (Reference 5).

Recent Executive Orders reiterate NRC’s mandate to carry out its mission statement while also considering the benefits of nuclear innovation (Reference 6). Congress, the NRC, and the Executive Branch recognize the importance of efficiently deploying advanced nuclear solutions. The requested exemption would allow the Facility the ability to self-administer non-power reactor operator licensing examinations, providing relief from the limited NRC resources dedicated to non-power operator licensees. This relief, which is authorized by law, would remove potential future scheduling barriers and enable the deployment of KP-FHR technology on an aggressive timeline without endangering life or property. Therefore, the requested exemption is in the public interest.

5 ENVIRONMENTAL CONSIDERATIONS

The exemption request meets the criteria for a categorical exclusion from environmental consideration. The list of categorical exclusions is in 10 CFR 51.22(a) through (e). The requested exemption meets criterion 10 CFR 51.22(a)(2) as further described below.

The requested exemption involves the education, training, experience, qualification, requalification, or other employment suitability requirements (10 CFR 51.22(a)(2)) because the exemption sought is specific to the administration of the operating tests and written examinations for the licensing of reactor operators. Therefore, the requested exemption meets the criteria for categorical exclusion.

6 CONCLUSION

On the basis of the information presented, Kairos Power requests that the NRC grant an exemption from 10 CFR 55.40(d) as noted above for the Hermes and Hermes 2 facility licenses.

7 REFERENCES

1. Atomic Energy Act of 1954, as amended, “Operators’ Licenses,” Section 107. April 4, 2024.
2. Nuclear Regulatory Commission, “Initial Licensed Operator Examination Requirements,” Federal Register, Vol. 64, No. 78, 64 FR 19868. April 1999.
3. SECY-96-206, “Rulemaking Plan for Amendments to 10 CFR Part 55 to Change Licensed Operator Examination Requirements,” Nuclear Regulatory Commission. September 25, 1996 (ML20134C900).

4. Division B - ADVANCE Act of 2024, Title V, "Improving Commission Efficiency," Section 501.
5. Nuclear Regulatory Commission, "NRC Approves Updated Mission Statement," Office of Public Affairs, No. 25-005. January 24, 2025.
6. Executive Order. "Ordering the Reform of the Nuclear Regulatory Commission, 14300, 2025" Federal Register Vol 90, No. 102 (May 23, 2025): 22587.
<https://www.govinfo.gov/content/pkg/FR-2025-05-29/pdf/2025-09798.pdf>