

**Enclosure 4**

**Exemption Requests to Portions of 10 CFR 55.55(a) and 10 CFR 55.59(a)(1)  
(Non-Proprietary)**

## Exemption Request to Portions of 10 CFR 55.55(a) and 55.59(a)(1)

### 1 BACKGROUND

Kairos Power LLC (Kairos Power) requests an exemption from portions of 10 CFR 55.55(a) and 55.59(a)(1). The current regulation would require the operator licenses to be renewed every six years (10 CFR 55.55(a)) and would require the requalification program to have a periodicity of 24 months (10 CFR 55.59(a)(1)). The requested exemption would allow a non-power KP-FHR facility (Facility) to extend the operator license expiration to twelve years and extend the requalification program periodicity to 36 months.

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). In the Nuclear Waste Policy Act of 1982, as amended, Section 306, Congress directed the NRC to further promulgate regulations for training and qualification of operators (Reference 2). In response, the NRC amended Part 55 to clarify the requirements for issuing licenses to operators and to describe the process for submitting operator license applications (Reference 3).

The license expiration was extended from every two years to six years in the 1987 Part 55 amendment. This extension was amended to “lessen the paperwork burdens of facility licensees and the NRC” (Reference 3). The originally suggested extension was five years, however, the inconsistency between the odd number of five and the biennial (every two years) medical requirements extended the new license expiration to six years. This extension demonstrated that the periodicity of the operator license can be extended for administrative reasons and without undermining the adequacy of the program.

The requalification period was also established in the 1987 Part 55 amendment. The period was not to exceed a “maximum of every two years” and required the operators to take the “requalification test once a year” (Reference 3). This continuous program was to be approved by the NRC as part of each facility’s training program. The Facility’s operator training and testing program, which must be approved for use by the NRC, maintains the yearly requirement to administer the operating test (10 CFR 55.57(a)(2)). This extension still maintains similar requirements to the continuous program established in the 1987 rulemaking but extends the requalification periodicity for administrative flexibility which does not undermine the adequacy of the program.

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 55.55(a) requires that the operator license expires after six years:

*(a) Each operator license and senior operator license expires six years after the date of issuance, upon termination of employment with the facility licensee, or upon determination by the facility licensee that the licensed individual no longer needs to maintain a license.*

The regulations in 10 CFR 55.59 requires that the requalification program does not exceed 24 months:

- (1) Successfully complete a requalification program developed by the facility licensee that has been approved by the Commission. This program shall be conducted for a continuous period not to exceed 24 months in duration.*
- (2) Pass a comprehensive requalification written examination and an annual operating test.*

## **3 EXEMPTION SOUGHT**

Kairos Power requests NRC approval of an exemption from the following portions of 10 CFR 55.55(a) and 10 CFR 55.59(a)(1), specifically the timing requirements of both “six” years for the operator license expiration and “24” months for the requalification program.

As a result of these exemptions:

1. The Facility’s operator licenses expire 12 years after the date of issuance and may file a renewal application in accordance with 10 CFR 55.57.
2. The Facility conducts requalification cycles over the course of 36 months, with an annual operating test. A written examination will be provided once every requalification cycle, by the end of the 36-month period.

## **4 JUSTIFICATION FOR EXEMPTION**

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

*...[G]rant 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.*

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.*

Importantly, the AEA neither prescribes nor limits the periodicity of the operator license or the requalification program. 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

The periodicity lengths of both the operator license expiration and the requalification program were selected for the purpose of periodically verifying an operator's qualifications. This is achieved through completing a requalification cycle, administering operator examinations, and reaffirming an operator's qualifications on a renewal application. The requested exemption maintains the requalification program standards, the yearly operating test in accordance with 10 CFR 55.59(a)(2), and the submittal of a license renewal application. The requested exemption does not alter the NRC's authority to verify an operator's qualification nor the adequacy of the program. This provides assurance that the requested exemptions 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. While the requested exemption would allow purely administrative changes, these changes extend the length of time to formally certify the operator's qualification. The operator's formal qualifications are maintained, and they have a reduced significance because non-power KP-FHR facilities are self-reliant mitigation facilities. Hence, an operator license extension to twelve years and a requalification program extension of 36 months would not cause operational errors that endanger public health and safety as described in this exemption request.

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.

The current periodicity of the requalification program requires the Facility to document each operator's completion of the cycle every 24 months, including the administration and documentation of the written examination. While the written examination demonstrates knowledge of an operator, it does not demonstrate the proficiency of an operator like the yearly operating test. Extending the written examination period to 36 months does not alter the adequacy of the program, because the knowledge portions of the written examination is supplemented by continual class training throughout the

requalification program. Extending the period of time for the written examination provides the Facility relief from an unnecessary administrative burden and while maintaining an adequate level of safety.

The current periodicity of the operator license requires the Facility to submit a renewal application for each operator every six years. The requested exemption does not alter the NRC's authority for the issuing the licenses nor the adequacy of the requalification program to maintain operator proficiency. The requested exemption extends the license expiration to decrease the administrative burden for the Facility and the NRC.

In the ADVANCE Act of 2024, Title V "Improving Commission Efficiency," Congress mandates 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 provide the Facility relief from the administrative burden associated with a shorter periodicity of the requalification program and operator license expiration. This relief, which is authorized by law, would remove potential future barriers to 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(c). The requested exemption meets criteria (i)-(vi) in 10 CFR 51.22(c)(25) as further described below.

The requested exemption involves no significant hazards consideration (10 CFR 51.22(c)(25)(i)) because the exemption involves only a change in the periodicity of the operator license and requalification program, which is programmatic in nature, and does not introduce any new significant hazards that could impact the environment.

The requested exemption involves no significant changes in the types or significant increases in the amounts of any effluents that may be released offsite (10 CFR 51.22(c)(25)(ii)) because the exemption involves only a change in the periodicity of the operator license and requalification program, which is

programmatic in nature, and does not involve any changes in the types or increase in the amounts of any effluents that may be released offsite.

The requested exemption involves no significant increases in individual or cumulative public or occupational radiation exposure (10 CFR 51.22(c)(25)(iii)) because the exemption involves a change in the periodicity of the operator license and requalification program, which is programmatic in nature, and does not contribute to any significant increase in individual or cumulative public or occupational radiation exposures.

The requested exemption involves no significant construction impacts (10 CFR 51.22(c)(25)(iv)) because the exemption involves a change in the periodicity of the operator license and requalification program, which is programmatic in nature, and does not involve any construction impact.

The requested exemption involves no significant increase in the potential for or consequences from radiological accidents (10 CFR 51.22(c)(25)(v)) because the exemption involves a change in the periodicity of the operator license and requalification program, which is programmatic in nature, and does not impact the potential for consequences from radiological accidents.

The requested exemption involves the education, training, experience, qualification, requalification, or other employment suitability requirements (10 CFR 51.22(c)(25)(vi)(E)) because the exemption sought is specific to the periodicity of the operator license and requalification program. 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 55.55(a) and 55.59(a)(1) as noted above for non-power KP-FHR facility licenses.

## **7 REFERENCES**

1. Atomic Energy Act of 1954, as amended “Operators’ Licenses,” Section 107. April 4, 2024.
2. Nuclear Waste Policy Act of 1982, as amended, “Nuclear Regulatory Commission Training Authorization,” Section 306. March 2004.
3. Nuclear Regulatory Commission, “Operator licenses and Conforming Amendments,” Federal Register, Vol. 52, No. 57, 52 FR 9460. March 25, 1987.
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>