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**Subject: Comment on “Environmental Assessment and Finding of No Significant Impact for the Construction Permits for the Kairos Hermes 2 Test Reactors,” Draft Report [Docket ID NRC-2023-0138]**

On April 4, 2024, the NRC published a *Federal Register Notice*<sup>1</sup> to solicit comments on the NRC staff’s draft Environmental Assessment (EA) of the environmental and other impacts of the Hermes 2 construction permit application. We commend the NRC for preparing an EA in lieu of a more labor-intensive Environmental Impact Statement (EIS) for this Federal action. The efficiencies gained by this approach are likely substantial. We also respectfully submit this comment letter pursuant to the solicitation.

The NRC’s draft EA acknowledges the purpose and need for the Hermes 2 reactor is to demonstrate the technology for possible future commercial deployment.<sup>2</sup> Hermes 2 advances Kairos Power’s objective to demonstrate fluoride salt-cooled, high temperature reactor (KP-FHR) technology. This represents a logical progression of the first Hermes demonstration reactor, for which Kairos Power received a construction permit in December 2023. Construction and operation of Hermes 2 will similarly provide experience to support potential future commercial reactors using this technology. We support these objectives and the vision that inspires them in hopes that commercial deployment of this technology becomes a viable, near-term reality.

The NRC staff concluded that the potential direct, indirect, and cumulative environmental impacts from Hermes 2 would not be significant and therefore has determined that a preliminary Finding of No Significant Impact is warranted. We support this finding.

**AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS**

In determining the cumulative environmental impacts associated with the construction, operation, and decommissioning of Hermes 2, the NRC staff evaluated a combination of past, present, and reasonably foreseeable actions or projects along with the potential effects of the Hermes 2 facility and concluded that the impacts would be small (presented in draft EA Table 5-1). ANS supports the NRC’s characterization of these impact levels as small.

<sup>1</sup> <https://www.federalregister.gov/documents/2024/04/26/2024-08964/kairos-power-llc-hermes-2-draft-environmental-assessment-and-draft-finding-of-no-significant-impact>

<sup>2</sup> <https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML24103A002>

## ALTERNATIVES

The draft has also considered the environmental impacts associated with two alternatives to construction, operation, and decommissioning of Hermes 2 at the proposed site in Oak Ridge, Tennessee:

- the no-action alternative
- Site alternatives, specifically construction, operation, and decommissioning of Hermes 2 at a site in Eagle Rock, Idaho (i.e., the Eagle Rock alternative)

Under the “no-action” alternative, the NRC assessed the environmental impacts of not issuing a construction permits to construct the proposed Hermes 2 test reactor, noting:

*The applicant could still build Hermes but would not have the ability to test elements of the Hermes 2 design absent from the Hermes design, such as the intermediate cooling loop. While forgoing the opportunities provided by Hermes 2 might not necessarily preclude future development of reactors using the KP-FHR technologies, it could slow or impede safe and efficient development of the technology.<sup>3</sup>*

While these detrimental outcomes of the “no-action” alternative are worth mentioning, others warrant consideration as well. The “no-action” alternative is not environmentally benign. When NRC issued its environmental Draft EIS for the initial Kairos Hermes test reactor, ANS and others submitted comments on the characterization of the “no-action” alternative.<sup>4</sup> Those same comments warrant reflection and consideration here.

Like the Hermes Draft and Final EISs, the Hermes 2 Draft EA fails to consider pressing concerns about the public's general welfare. Timely deployment of the advanced reactor designs will be necessary if the United States is to meet its aggressive decarbonization targets. In addition to clean electricity generation, advanced reactors like the KP-FHR will be essential for large scale replacement of greenhouse gas-emitting fossil fuels in many industrial applications. Failure to issue a timely construction permit for Hermes 2 would have a chilling effect on the deployment of all advanced nuclear energy systems, thereby jeopardizing the nation's ability to limit the extent of harmful climate impacts. This substantial impact to the local, national, and global community should be duly considered in all environmental reviews undertaken by the NRC and reflected in their decision-making records, including the final EA for the Hermes 2 test reactor.

Since we submitted comments on the Hermes draft EIS, the Fiscal Responsibility Act (FRA) was passed. This legislation calls for a revision to the National Environmental Policy Act (NEPA). Title III – Permitting Reform, Sec. 321. BUILDER ACT, includes the following provision:

*(a)(3)(B)(iii) a reasonable range of alternatives to the proposed agency action, including an analysis of any **negative environmental impacts of not implementing the proposed agency action** [emphasis added] in the case of a*

<sup>3</sup> <https://www.nrc.gov/docs/ML2410/ML24103A002.pdf>, p. 4-1, lines 38-42

<sup>4</sup> <https://www.nrc.gov/docs/ML2321/ML23214A269.pdf>, pp. G-8 to G-11

*no action alternative, that are technically and economically feasible, and meet the purpose and need of the proposal...<sup>5</sup>*

The final EA for Hermes 2 should include a description and characterization of the negative environmental impacts of the “no-action” alternative, consistent with the FRA.

In the Hermes 2 draft EA, the NRC staff also considered other possible alternative sites, and layouts of proposed facilities within sites, modification of existing facilities instead of building new facilities, alternative technologies, and alternative transportation methods. The staff determined no other reasonable alternative sites warranted detailed consideration. We support this determination.

In summary, we greatly appreciate this opportunity to comment on the draft EA, and we commend the NRC staff for taking steps toward more efficient and equally effective environmental reviews (consistent with broad discretion afforded under NEPA). Demonstration at the front end of the licensing process is vital to deployment of new reactor technologies for commercial use at scale. We look forward to working closely with the NRC staff, the nuclear industry, and other stakeholders in support of future demonstration and commercial projects.

Sincerely,

Kenneth S. Petersen

Craig H. Piercy



President  
American Nuclear Society

Executive Director / CEO  
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<sup>5</sup> <https://www.congress.gov/118/plaws/publ5/PLAW-118publ5.pdf>, 137 STAT. 38