



December 6th, 2022
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: DRAFT NUREG-2263 “Environmental Impact Statement for the Construction Permit for the Kairos Hermes Test Reactor”, Docket ID: NRC-2021-0193-0012 (SEPT. 9, 2022)

Dear U.S. Nuclear Regulatory Commission Staff:

The Nuclear Innovation Alliance (NIA) would like to thank the U.S. Nuclear Regulatory Commission (NRC) for allowing the NIA to provide comments on the Draft Environmental Impact Statement (Draft EIS) prepared for the Construction Permit (CP) for the “Kairos Hermes Test Reactor” (Hermes). The NIA agrees with the NRC staff’s recommendation that “unless safety issues mandate otherwise”, the NRC issue the CP application to Kairos Power to construct and demonstrate a prototype, molten salt cooled, TRISO fueled, nonpower reactor at the East Tennessee Technology Park site in Oak Ridge, Tennessee. The Hermes Reduced-Scale Test Reactor is based on Kairos Power’s commercial-scale Kairos Power Fluoride Salt-Cooled High Temperature Reactor KP-FHR that leverages TRI-structural ISOtropic fuel (TRISO) in pebble form and is cooled by low-pressure fluoride salt coolant.

In December 2020, the U.S. Department of Energy (DOE) announced Kairos Power as a “Risk Reduction” award winner under the Advanced Reactor Demonstration Program (ARDP). According to the DOE, ARDP is designed to help domestic private industry demonstrate advanced nuclear reactors in the United States. This collaborative effort between the U.S. DOE Office of Nuclear Energy (DOE-NE) and private industry can help the United States meet national and global climate and energy policy objectives by taking leadership in advanced technology sources that are clean, firm, and can operate safely.

Under ARDP, Kairos will demonstrate the Hermes Reduced-Scale Test Reactor. The Hermes reactor will provide Kairos Power and the NRC the opportunity to test technologies, design features, and safety functions related to the KP-FHR. Hermes will have cross-cutting benefits including demonstrating the feasibility of using and managing TRISO fuel in pebble form and the management of molten fluoride-lithium-beryllium (FLiBe) salt cooled systems. Successful deployment and operation of a molten salt cooled, pebble bed reactor could demonstrate how advanced nuclear technologies can help decarbonize communities and industries that lack clean, firm, and sustainable power sources.

The Draft EIS prepared by the NRC found that Kairos Power’s Hermes Test Reactor would have very limited impacts to the environment. Specifically, the NRC staff concluded that the design would result in “SMALL” environmental impacts across all studied resources areas. The Draft EIS also highlighted the protective characteristics of TRISO fuel pebbles including the ability to mitigate significant radioactive effluent release in an accident scenario. Further, the Draft EIS determined that Hermes Test Reactor would result in minimal to no expected cumulative impacts related to land use, air quality, or water resources in Oak Ridge, Tennessee, despite conservative assumptions. Having reviewed the Draft EIS, NIA agrees that the careful analysis conducted by NRC supports these high-level conclusions. The NRC’s findings provide important substantive insights into the environmental impacts of the Hermes reactor. The NRC review also provides

process insights that will benefit environmental reviews of subsequent advanced reactors. The NRC's commitment to scoping and performing environmental reviews commensurate with the potential impacts of the licensed activity is critical to ensuring effective and efficient regulation of advanced reactors.

NIA appreciates Kairos Power's and the NRC's diligence in preparing and performing a full EIS for the Construction Permit for the Kairos Hermes Test Reactor. The NIA awaits the Final Environmental Impact Statement from the Nuclear Regulatory Commission. If you have any questions, please contact me at vibarrajr@nuclearinnovationalliance.org.

Sincerely,

Victor Ibarra, Jr.
Analyst
Nuclear Innovation Alliance