

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Pre-Application Licensing Report on the Development of a Mechanistic Source Term Methodology for the Kairos Power Fluoride-Cooled High-Temperature Reactor (KP-FHR) – Kairos Power, LLC

SECTION B. Project Description

Kairos Power, LLC, in collaboration with Brigham Young University (BYU), proposes to develop and document the methodological approach for establishing the mechanistic source term (MST) for the KP-FHR. This methodology directly supports implementation of the fundamental KP-FHR safety strategy which relies on fission product retention within the fuel and within the molten salt coolant with little or no reliance on other safety features and without the need for active safety systems. Laboratory experiments will be performed in Flibe to address knowledge gaps. The design-specific MST will be documented in a licensing report for NRC review and safety evaluation.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage / Chemical Waste Disposal / Hazardous Waste Disposal – Brigham Young University will be using small lab-scale quantities of chemicals representing the KP-FHR coolant (fluoride, lithium, beryllium). The BYU will be operating under BYU Environmental Safety and Health program and in compliance with applicable laws, regulations, and permits. The action would not create additional environmental impacts above those already permitted at the university.

SECTION D. Determine the Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.

Note: For Categorical Exclusions (CXs) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: B3.6 Siting, construction, modification, operation, and decommissioning of facilities for small-scale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of research and development activities aimed at evaluating fission product retention in molten salt coolant and preparation of a licensing report.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on 05/06/2019