From: Michael Orenak
To: Darrell Gardner; Drew Peebles
Cc: Matthew Hiser; Edward Helvenston; William Jessup; Candace de Messieres
Bcc: Pravin Sawant
Subject: Hermes 2 Audit Questions 1.3-1 and 1.3-2
Date: Tuesday, October 31, 2023 1:15:00 PM

Darrell and Drew,

Below is the second set of audit questions for the Hermes 2 General Audit. The NRC staff would like to have a discussion regarding these questions when Kairos is ready. The NRC staff would like to have the discussion before any written responses are submitted.

PSAR Chapter	Request Number	Request/Question
1.3, "General Description of the Facility"	1.3-1	The proposed operating life for the Hermes 2 test reactor facility is 11 years, as compared to the 4-year operating life proposed for the Hermes 1 test reactor facility; this increased operating life could affect the safety functions of the Hermes 2 structures, systems, and components (SSCs). Upon review of the Hermes 2 preliminary safety analysis report (PSAR), the NRC staff identified limited information regarding analyses or other evaluations that were performed to account for or justify the longer operating life, as compared to the Hermes 1 test reactor facility. The NRC staff is seeking to understand Kairos's approach to account for the increased operational life and would like to discuss this topic with the Kairos staff. Additionally, the NRC staff requests that Kairos provide a list of any new design changes, analyses, evaluations, or additional data collection (e.g., experiments, testing) that were performed or are currently planned to support the longer operating life for the Hermes 2 facility. The NRC staff expects that this list would focus primarily on analyses or evaluations performed or planned to justify the longer operating life for the safety-related SSCs listed in Hermes 2 PSAR Table 3.6-1.
13.1, "Initiating Events and Scenarios"	13.1-1	Key design changes for the Hermes 2 test reactor facility, as compared to the Hermes 1 test reactor facility, include the use of an intermediate heat transport system (IHTS) and a shared power generation system (PGS). However, the PSAR and associated technical report KP-TR-022-P, "Hermes 2

		Postulated Event Methodology," do not discuss any new calculations or analysis results that include modeling of the IHTS (with associated SSCs such as intermediate heat exchanger and superheater), the PGS, or interactions between the two units. If such calculations or related analyses have been performed, please make them available in the electronic reading room for the audit. If Kairos has not performed such calculations or analyses because it has separately determined that the Hermes 1 events remain bounding, please make available for audit any justifications or analyses to support the conclusion that events evaluated for the Hermes 1 test reactor facility remain bounding for the Hermes 2 test reactor facility.

If you have any questions or need clarifications on the questions before the discussion, please do not hesitate to contact me. This email will be added to ADAMS and will be made public.

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