

Enclosure 1

**Kairos Power Response to NRC Question Q17
(Non-Proprietary)**

Question Number: 2-3-22 Q17

Preliminary safety analysis report (PSAR) Chapter 14 describes a limiting condition for operation (LCO) technical specification (specifically, LCO 3.4, Engineering Safety Features – Reactor Vessel Integrity) that will be developed for the Hermes operating license to provide a limit on the reactor vessel system temperature. However, PSAR Chapter 7 does not appear to include a description of a temperature monitoring device to determine compliance with this LCO. Will this device be an input to the reactor protection system or an indicating alarm to the operators to take action should the temperature exceed a certain value? How many channels will be available? Will this LCO be based on the coolant temperature sensor or vessel temperature sensors?

Kairos Power Response:

There will be a temperature monitoring device, as described in Section 7.3.1, that will be a safety-related input to the reactor protection system (RPS) for automatic actuation by the RPS should the temperature exceed limits. This device would be the input for reactor vessel integrity monitoring and is referred to as the core outlet temperature.

There are no credited operator actions in the safety analysis (see Section 7.4.3.1). The signal from the temperature monitoring device will also provide information to the operators through a data diode to inform preventative actions that operators might want to take on the non-safety related plant control system (See Section 7.2.1 and 7.3.1). The temperature monitoring device that informs the LCO mentioned in Chapter 14 is the core outlet temperature mentioned in the previous paragraph.

As described in Section 7.1.1 and Section 7.5.3, the PSAR commits to implementing Institute of Electrical and Electronics Engineers (IEEE) Standard 603 and will include redundant channels. However, the number of channels will be informed by the safety analysis, so that information will be provided in the final safety analysis report (FSAR). Likewise, although it is most likely that the specific type of temperature monitoring device will be a coolant temperature sensor, rather than a vessel temperature sensor, the specific type and location of the sensor will be informed by the final design and will be provided in the FSAR.

Impact on Licensing Document:

This response has no impact on the content of the Hermes Non-Power Preliminary Safety Analysis Report.

References:

none