




Kairos Power

HALEU WORKSHOP

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Kairos Power's mission is to enable the world's transition to clean energy, with the ultimate goal of dramatically improving people's quality of life while protecting the environment.

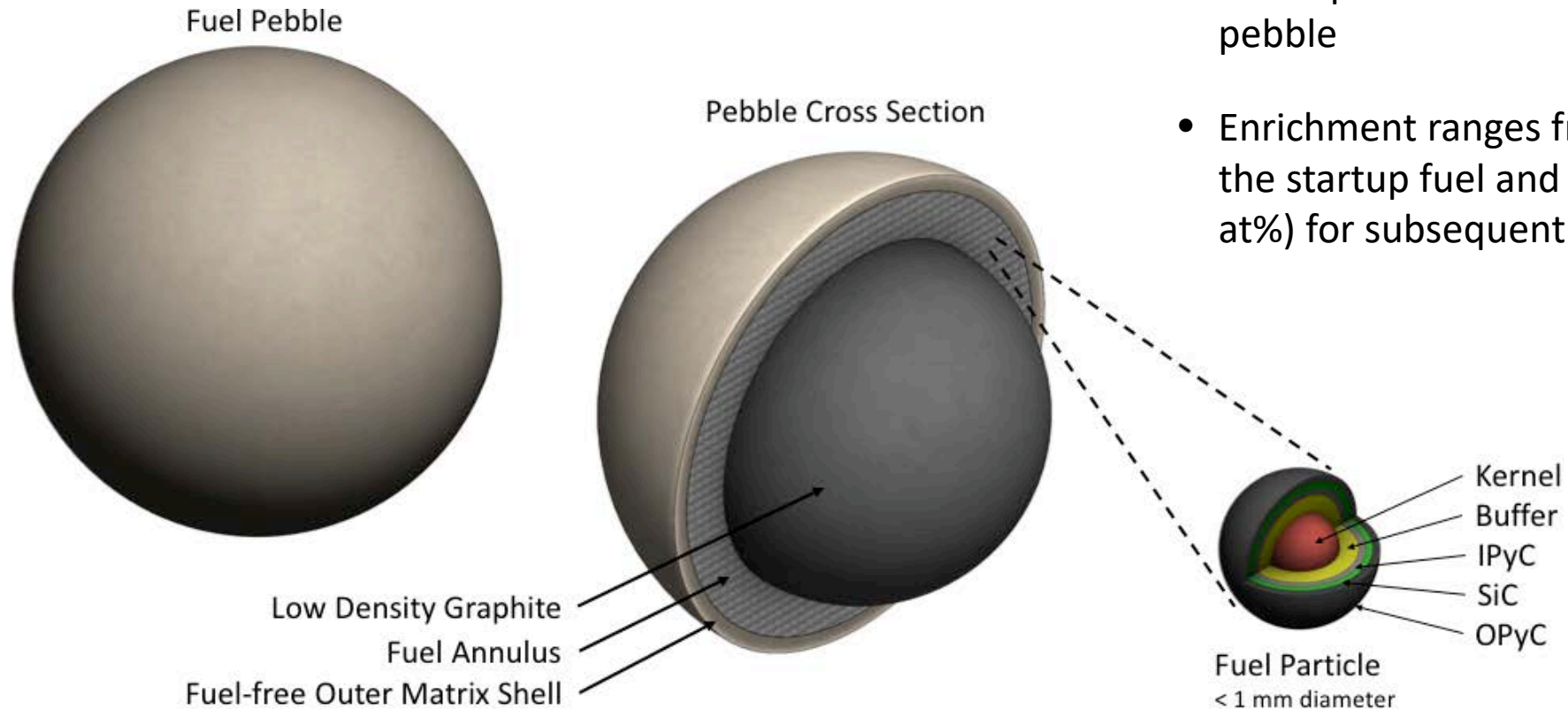
Overview of Kairos Power

- Nuclear energy engineering and design company *singularly focused* on the commercialization of the fluoride salt-cooled high temperature reactor (FHR)
 - Founded in 2016
 - Based in the San Francisco Bay Area
 - Current Staffing
 - 141 Employees (*and growing*)
 - 90% Engineering Staff
- Private funding secured for major design, licensing, and technology development programs
- Schedule driven by US demonstration by 2030 (*or earlier*) and rapid deployment ramp in 2030s

Kairos Power Headquarters



TRISO Annular Fuel Pebble Design for KP-FHR



- Fuel pebble consists of ~ 16,000 UCO TRISO particles with ~ 6 g uranium per pebble
- Enrichment ranges from 10 – 15 wt% for the startup fuel and 19.55 wt% (19.75 at%) for subsequent fuel

KP-FHR Fuel Fabrication Requirements

- KP-1 commercial reactor fuel requirements:
 - KP-1 reactor fuel core load requires ~ 300,000 pebbles with each pebble containing ~ 6 gU / pebble
 - Average residence of each pebble is ~ 500 days, so effectively a full fuel load is required every 16 months
 - Equilibrium fuel cycle operates on 19.75 at% fuel
- Fuel fabrication facility requirements:
 - SNM quantity Category II site license
 - Review of site license must be completed in a timely fashion to enable deployment of advanced reactor fuel. Advanced reactor technology can only be deployed if HALEU fuel is available for operation.

KP-FHR Commercial Fuel Shipping Requirements

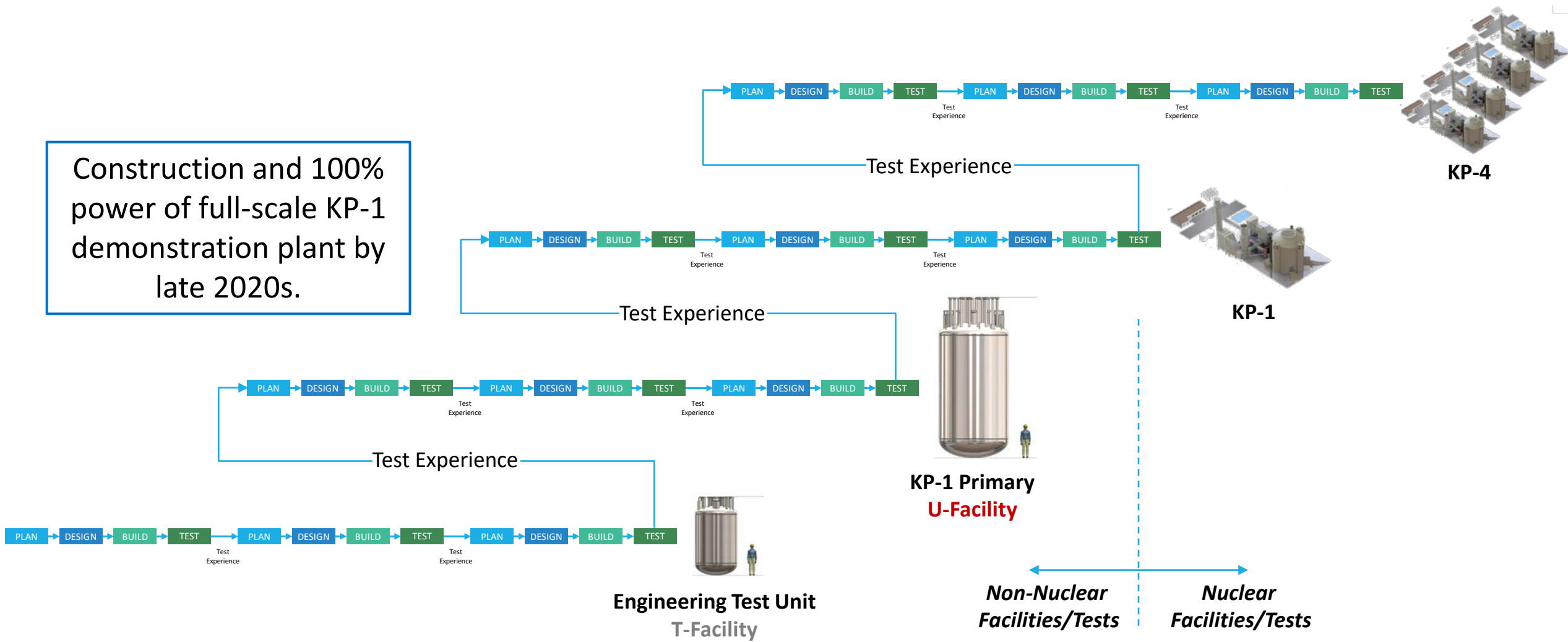
- Container required for the transport of HALEU oxide powder to the TRISO fuel fabrication facility
 - Container to be received at a SNM quantity Category II facility
- TRISO fuel fabrication facility to produce the the annular fuel pebble form, and other TRISO fuel products
 - KP-FHR annular fuel pebble diameter is 4 cm
 - Fresh fuel transport requires Type A container capable of maximizing the number of fresh fuel pebbles for shipment

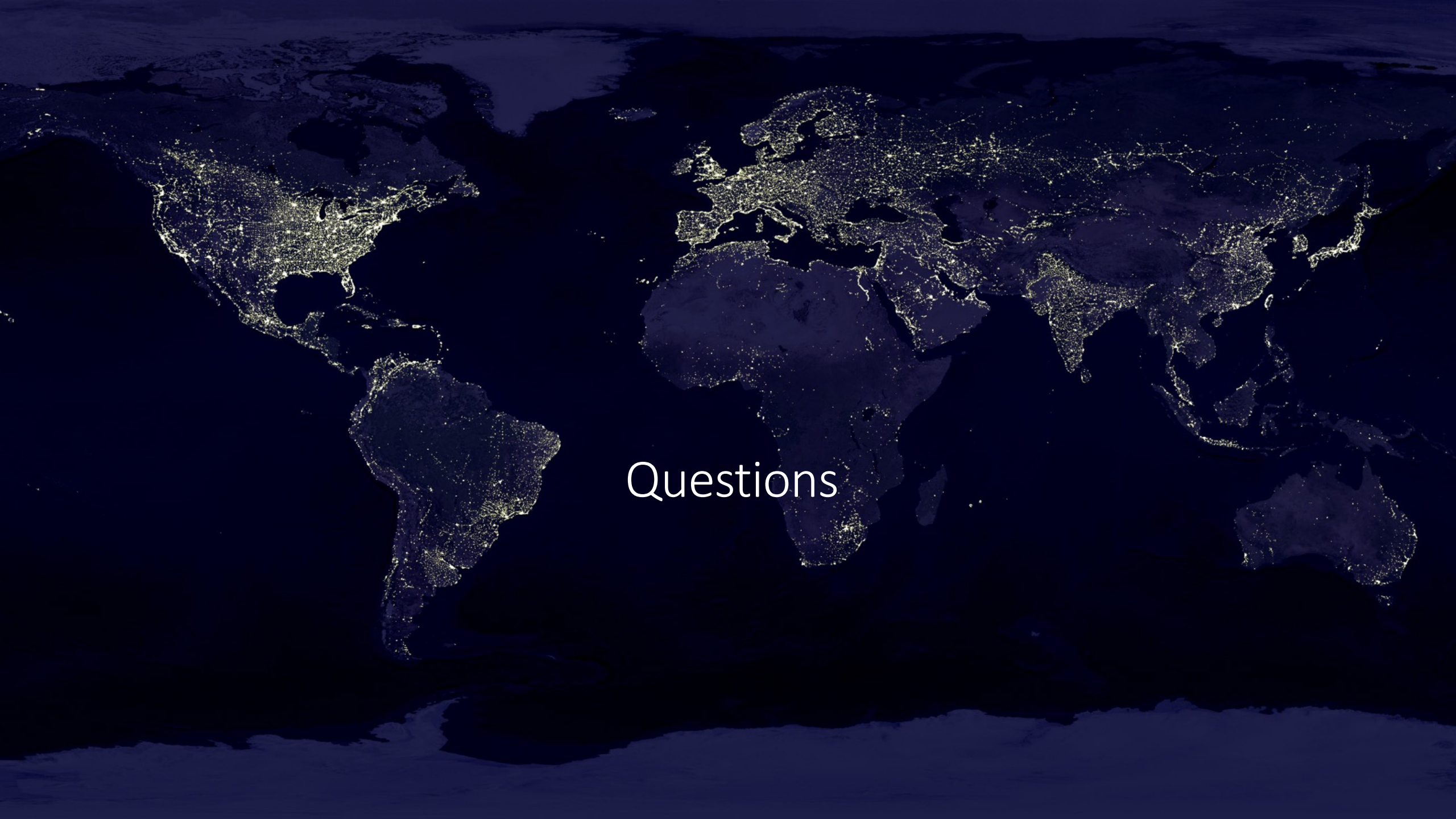
KP-FHR Development Strategy

- Kairos anticipates a need for ~ 200 kg HALEU product @ 14% enrichment in early 2024 to support TRISO fuel fabrication
- HALEU fuel product needed in oxide form, preferably U_3O_8
- Development of both KP-FHR reactor technology and fuel fabrication requires clarity in criticality rules for Category II licensed facilities
 - The pebble handling system and related system components require significant effort to address criticality requirements
 - Similarly, fuel fabrication system components involve batch processing where batch size is determined by criticality limits

Kairos Power Iterative Process Reduces Nuclear Development Risk

Construction and 100% power of full-scale KP-1 demonstration plant by late 2020s.





Questions