




Kairos Power

PROGRESS UPDATE

OCTOBER 2022



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.

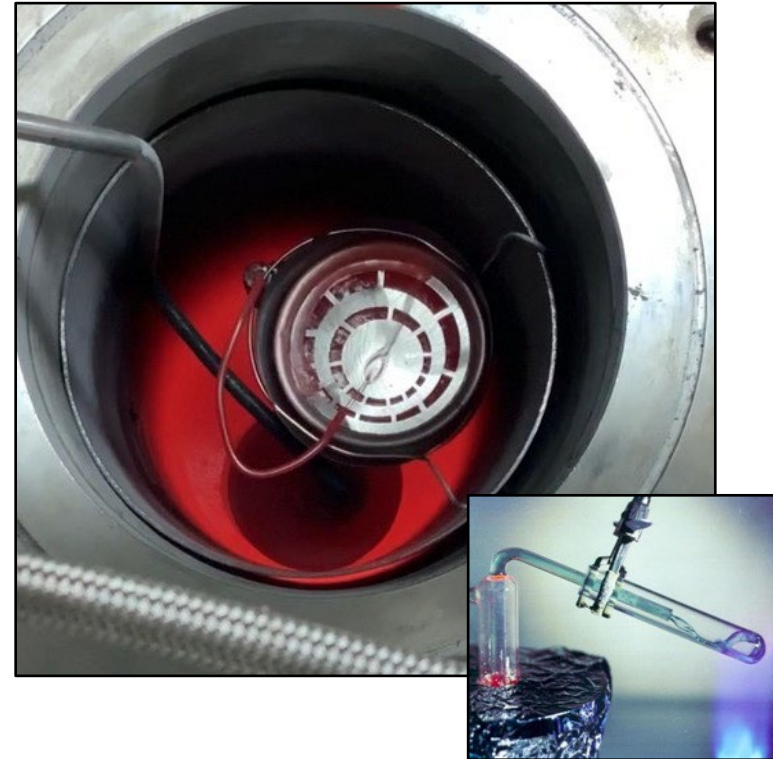
In order to achieve this mission, we must prioritize our efforts to focus on a clean energy technology that is *affordable* and *safe*.

Fluoride Salt-Cooled High-Temperature Reactor Technology Basis

Coated Particle Fuel
TRISO



Liquid Fluoride Salt Coolant
Flibe (2LiF-BeF₂)



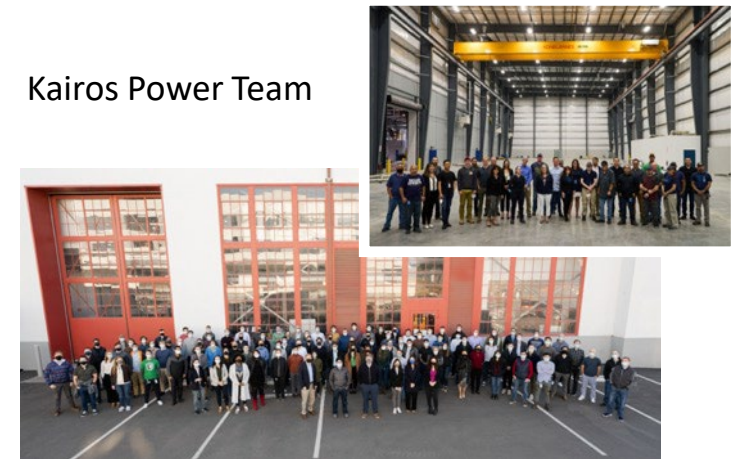
Overview of Kairos Power

- Nuclear energy engineering, design, and manufacturing company *singularly focused* on the commercialization of the fluoride salt-cooled high-temperature reactor (FHR)
 - Founded in 2016
 - 293 Employees (~90% Engineering Staff)
- Novel approach to nuclear development, highly informed by the success of SpaceX, that includes iterative hardware demonstrations and in-house manufacturing to achieve disruptive cost reduction and provide true cost certainty
- Schedule driven by US demonstration by 2030 (*or earlier*) and rapid deployment ramp in 2030s
- Cost targets set to be competitive with natural gas in the US electricity market

Kairos Power Headquarters



Kairos Power Team



Kairos Power Locations



HQ / R-Lab / S-Lab
Alameda, CA



T-Facility / Engineering Test Unit
Production Development Facility
Albuquerque, NM




Molten Salt Purification Plant
Elmore, OH

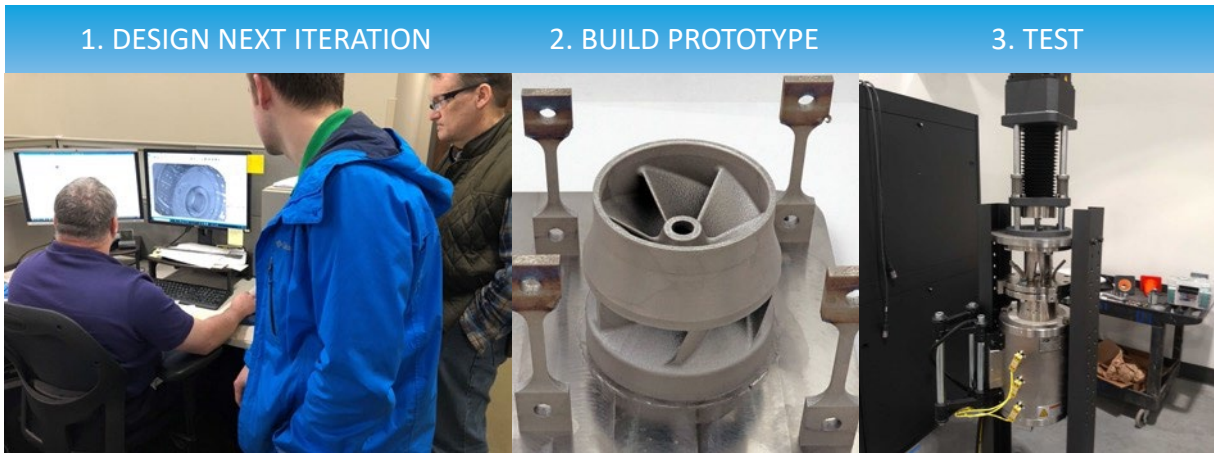
Hermes Reactor
Oak Ridge, TN



Licensing Office
Charlotte, NC

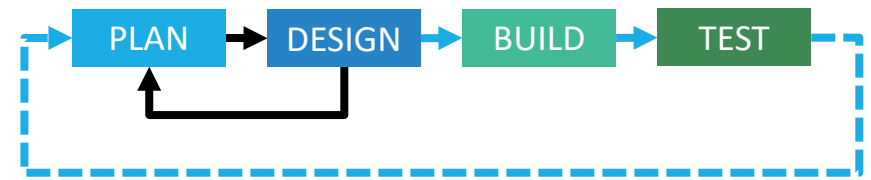
-  Kairos Power Facilities
 - **RAPID Lab**
 - **Salt Lab**
 - **Testing Facility**

Kairos Power Nuclear **Development** Paradigm Shift



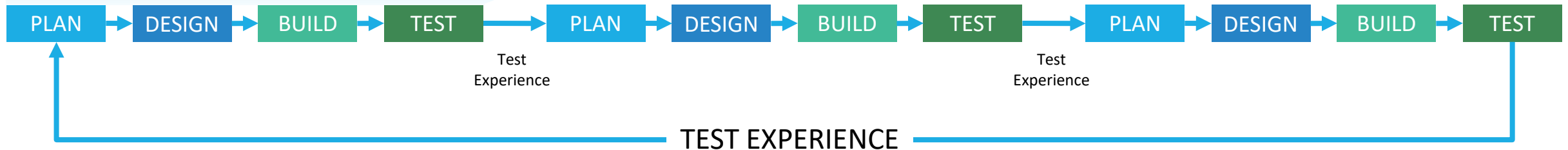
 Additive manufacture
water testing prototype 

Conventional Nuclear Development Cycle

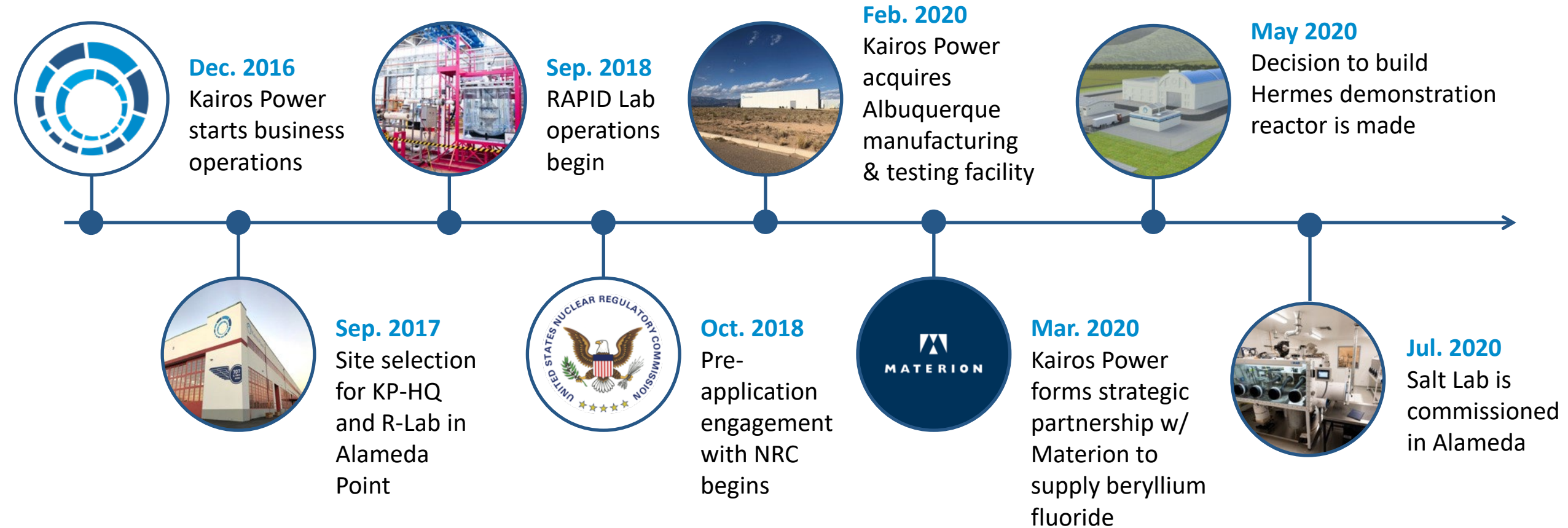


TEST EXPERIENCE

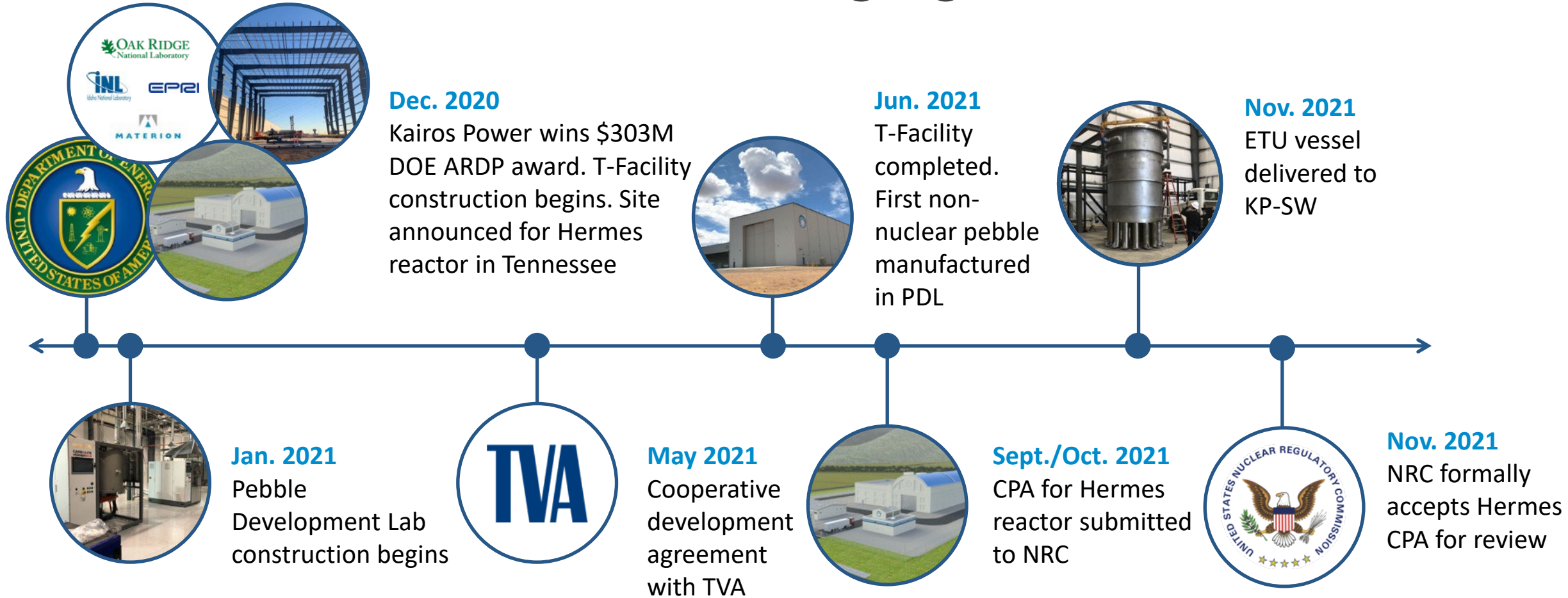
Kairos Power Accelerated Test Cycles for Innovation and Optimization



Kairos Power Highlights



Kairos Power Highlights



Kairos Power Highlights



Q1 2022
ETU construction is underway with vessel, PHTS piping, and supporting structures installed



Q2 2022
30,000 simulated fuel pebbles completed in the KP-SW Pebble Development Lab



Apr. 2022
Kairos Power establishes the KP-OMADA Development Consortium



Aug. 2022
ETU hot commissioning begins



Q1 2022
Graphite moderator blocks manufactured at KP-SW are loaded into the vessel



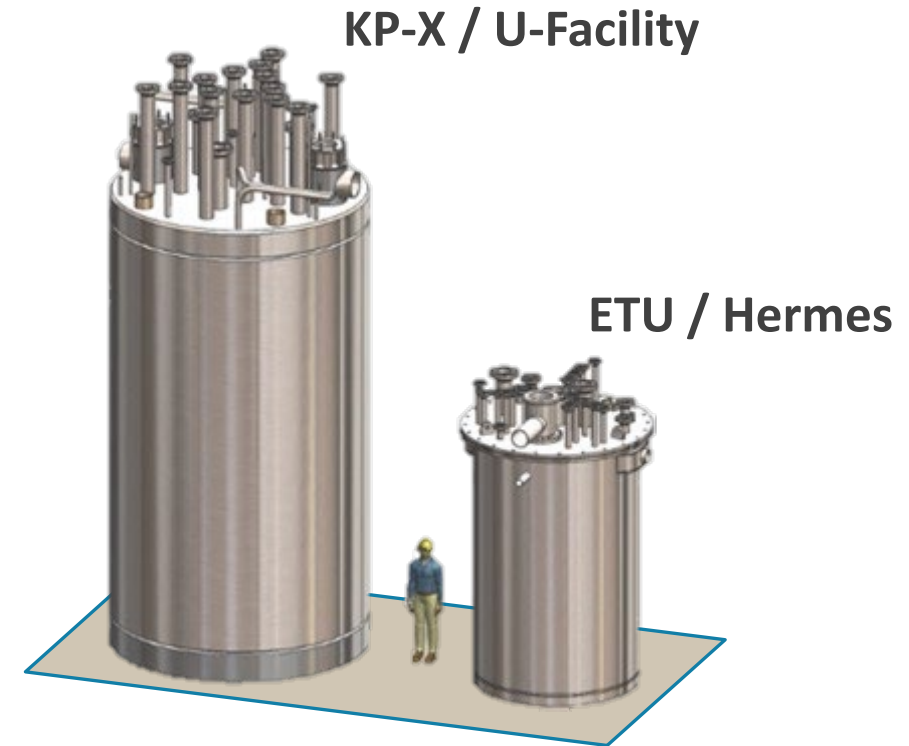
Apr. 2022
Kairos Power wins 2022 BloombergNEF Pioneer Award



July 2022
Molten Salt Purification Pilot commissioned with Materion Corp.

Kairos Power Engineering Test Unit (ETU) Overview

- What?
 - A **non-nuclear, unenriched Flibe-wetted, and isothermal** integrated test for principal SSCs (e.g., vessel, pump, pebble handling, CRDMs, etc.)
 - Full-scale version of Hermes and proportional to KP-X Commercial Reactor
- Why?
 - **Cost:** Establish competitive cost through vertical integration
 - **Supply Chain:** Initiate and exercise supply chain for KP-FHR specialized components and materials
 - **Design / Test:** Demonstrate design and integration of principal KP-FHR technologies
 - **Operations:** Accelerate experience base of large-scale Flibe facility and initial plant operations



ETU provides confidence in Kairos Power's ability to design, build, and operate high-temperature Flibe systems

ETU enclosure in T-Facility
August 2021

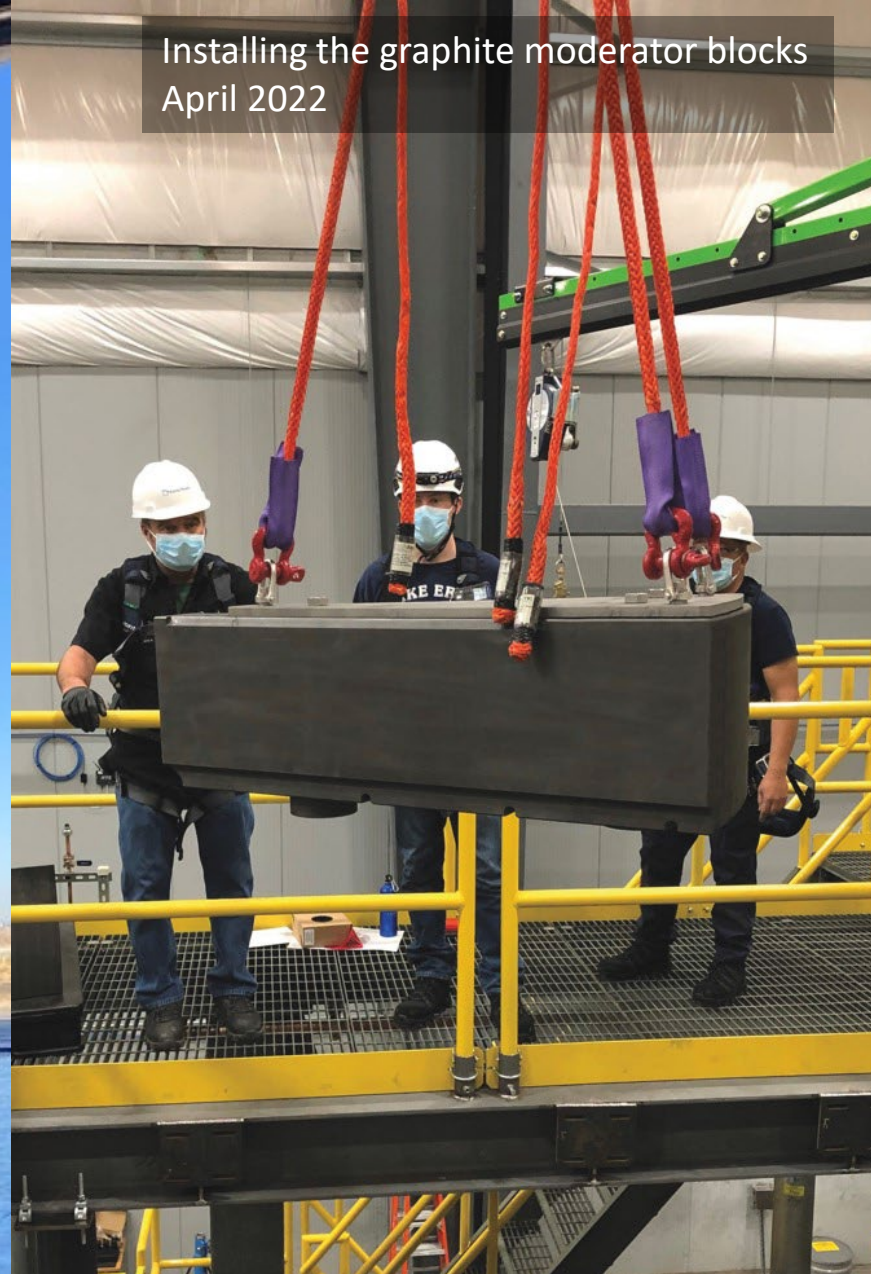


ETU enclosure in T-Facility
August 2022





Engineering Test Unit vessel is delivered
November 2021

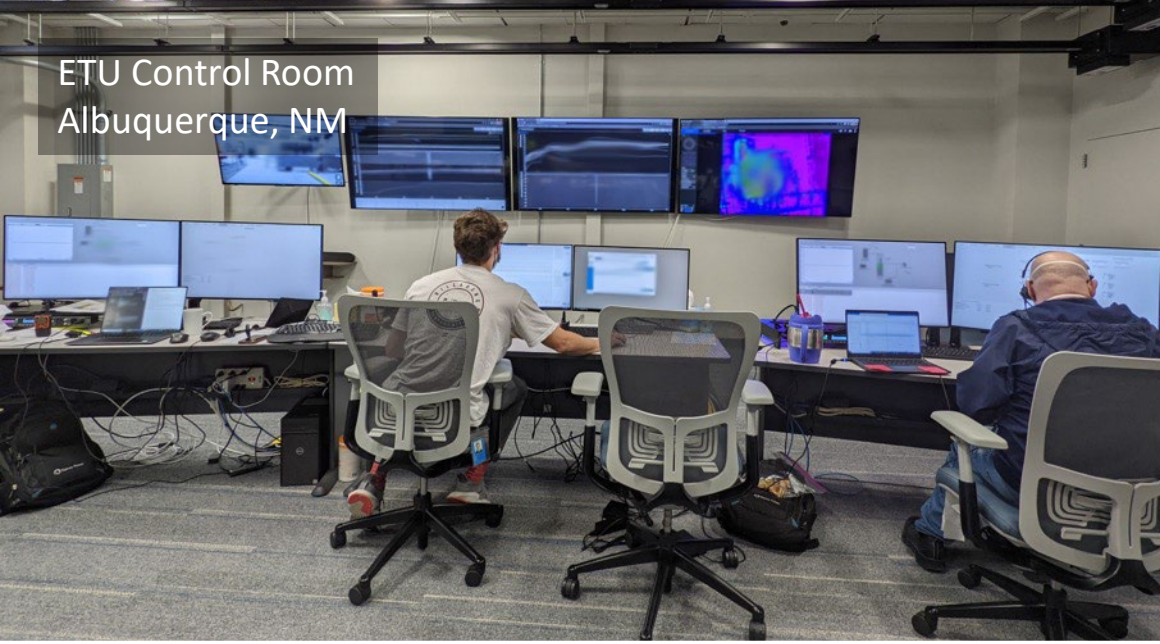


Installing the graphite moderator blocks
April 2022



Adding the 30,000th simulated fuel pebble
May 2022

ETU Control Room
Albuquerque, NM



Engineering Test Unit
August 2022



Argos Remote Control Room
Alameda, CA



Kairos Power Commissions MSPP to Produce Coolant for High-Temperature Molten Salt Reactors

- Kairos Power has commissioned the **Molten Salt Purification Plant** (MSPP) in partnership with Materion Corporation
- MSPP will produce large quantities of high-purity fluoride salt coolant (Flibe) for the Engineering Test Unit and future hardware demonstrations
- **Confirms process to produce Flibe at industrial scale** and establishes commercial production
- Reduces risk in a critical path workstream to **achieve cost certainty for KP-FHR technology**
- Largest Flibe production facility ever built

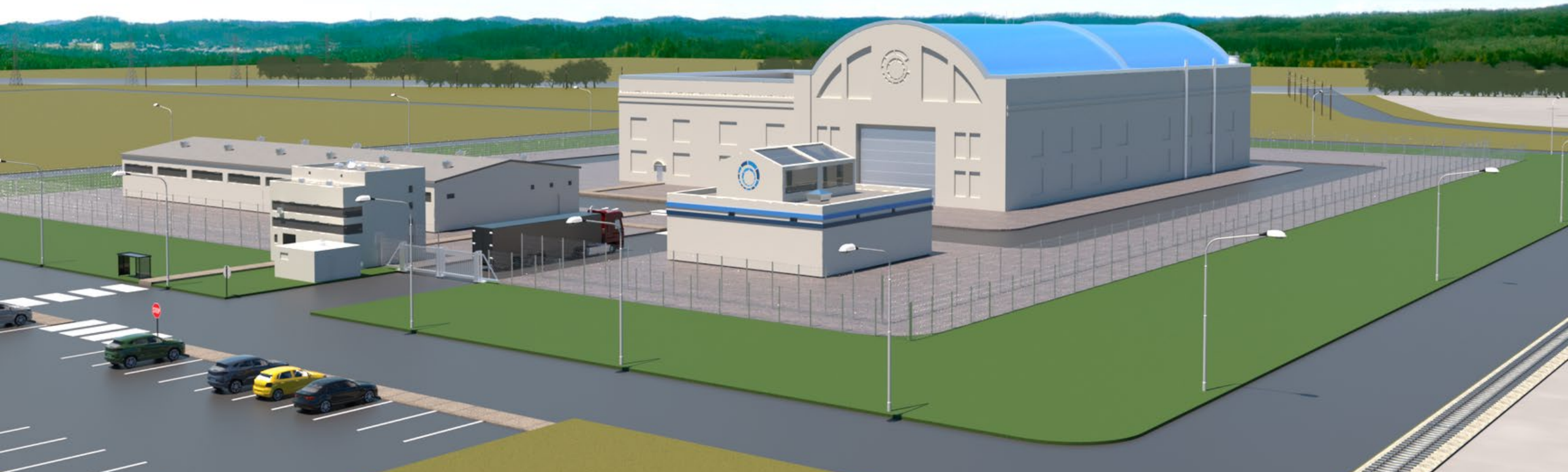


 MSPP is located at the Materion Campus in Elmore, Ohio

Hermes Demonstration Reactor

Heritage Center K-33 Site / Oak Ridge, TN

Hermes will ultimately demonstrate the U.S. aptitude to license an advanced reactor in a timely manner



Hermes Construction Permit Application (CPA) Submittal

- NRC accepted Kairos Power's CPA for review in November 2021
- Robust pre-application engagement with 11 topical reports and several technical reports supporting the CPA
- Draft Environmental Impact Statement issued
- Anticipated Construction Permit issuance in October 2023



Hermes Non-Power Reactor Preliminary Safety Analysis Report

HER-PSAR-001
Revision 0
September 2021

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Hermes Non-Power Reactor Environmental Report

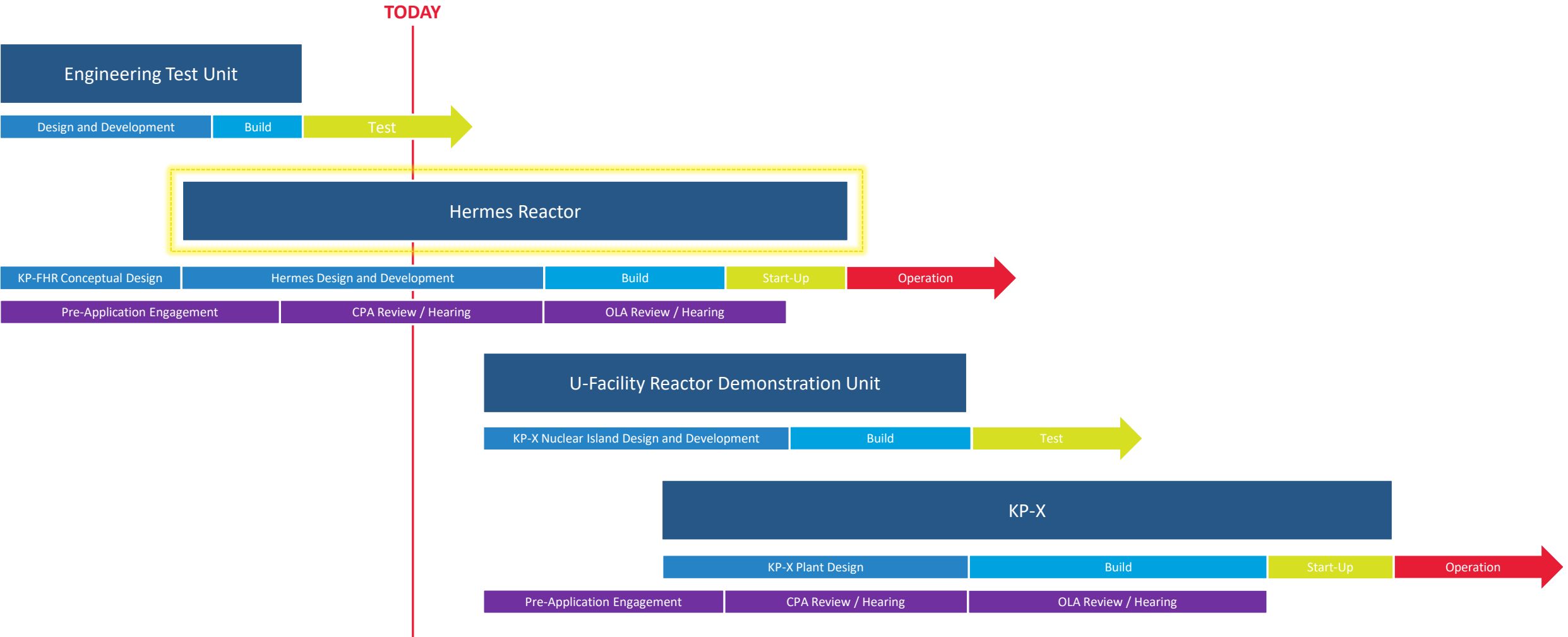
HER-ER-001
Revision 0
October 2021

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Project Status Dashboard:

<https://www.nrc.gov/reactors/non-power/hermes-kairos/dashboard.html>

Kairos Power Development Schedule



The End



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