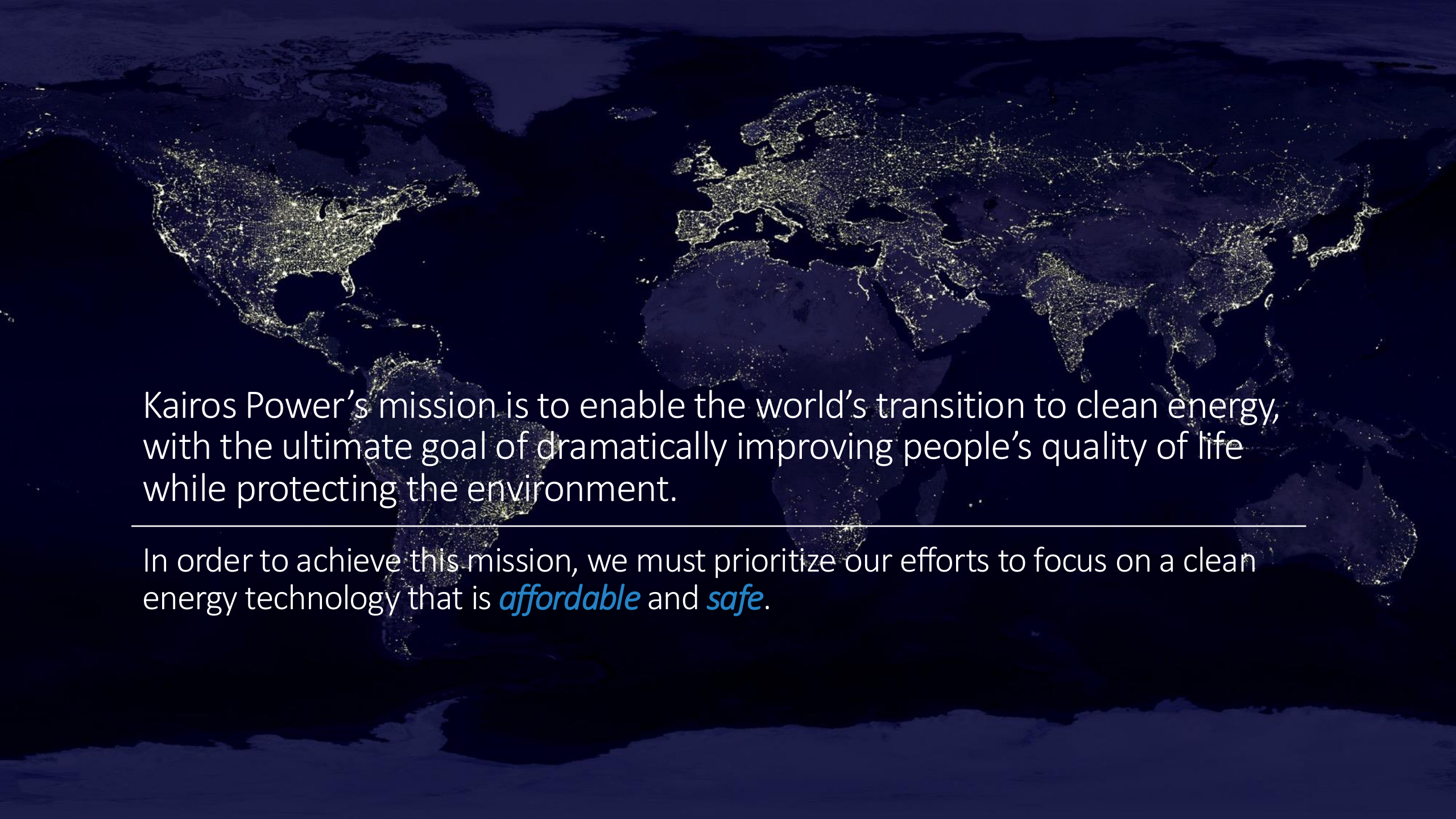




KAIROS POWER UPDATE AND PROGRESS: ACHIEVING PASSIVE SAFETY
ANS TRINITY DINNER
PER PETERSON, CHIEF NUCLEAR OFFICER
17 JANUARY 2025



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*.

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; headquartered in Alameda, CA
 - ~450 Full Time Employees Company-Wide
- Expanded to Albuquerque, NM in 2020
 - ~ 130 Full Time Employees in Albuquerque
 - Located at former Schott Solar Building, Hawking Drive SE
 - 172,000 ft² Testing, manufacturing, office space



Kairos Power Team



Kairos Power Headquarters
Alameda, CA



Testing and Manufacturing Facility
Albuquerque, NM

Fluoride Salt-Cooled High Temperature Reactor

Technology Basis



Coated Particle Fuel
TRISO



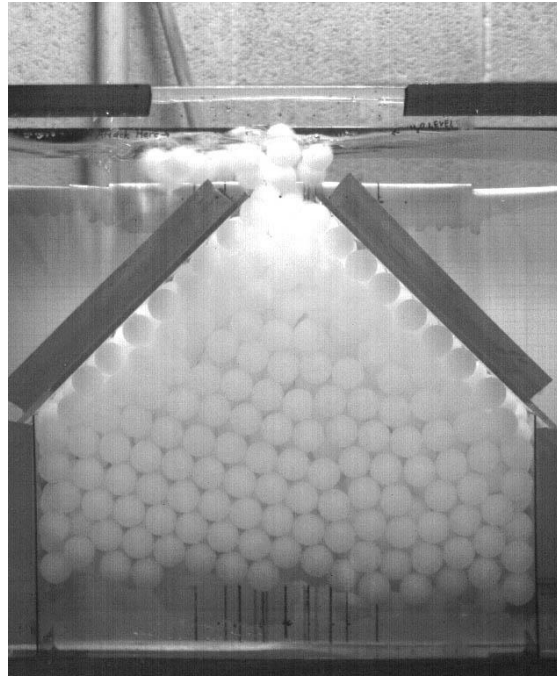
Liquid Fluoride Salt Coolant
Flibe ($2\text{LiF}-\text{BeF}_2$)

The Origin of the Use of Pebble Fuel in FHRs

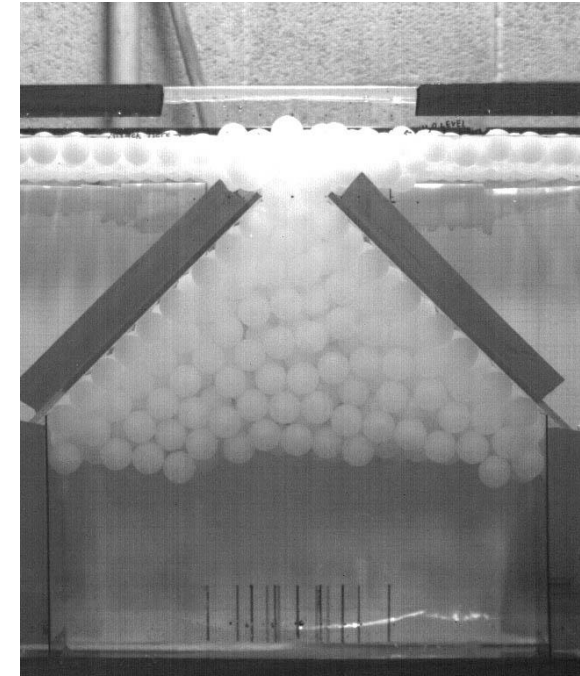
First Proof of Principle: 2006



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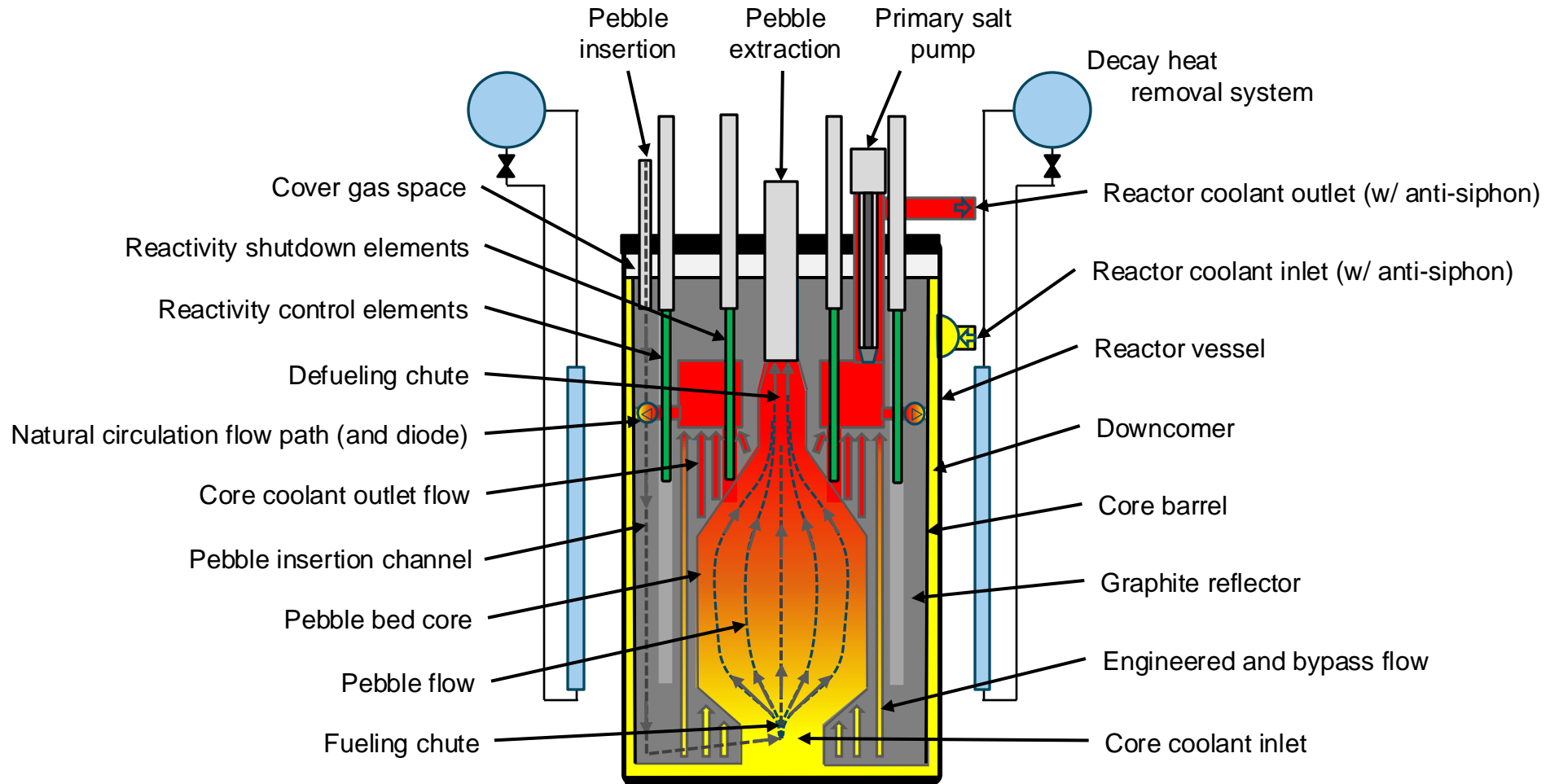


18.0 sec

1.0" diameter HDPE spheres (40% geometric scale for a 6.0 cm diameter pebble), submerged in a water tank, demonstrated that defueling from the top of a core is practical

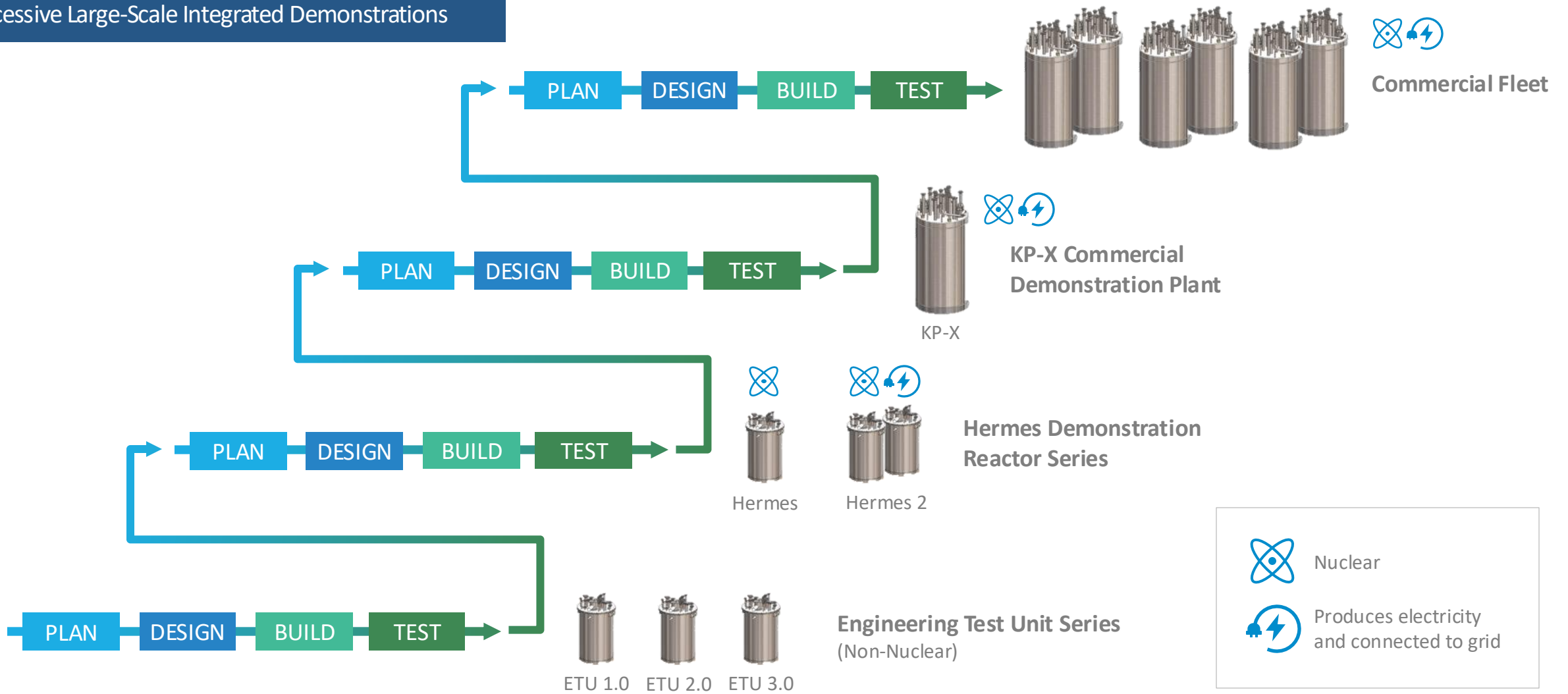
Hermes (and KP-X) Reactor Schematic

Major Systems and Functions



Kairos Power Path to Commercialization

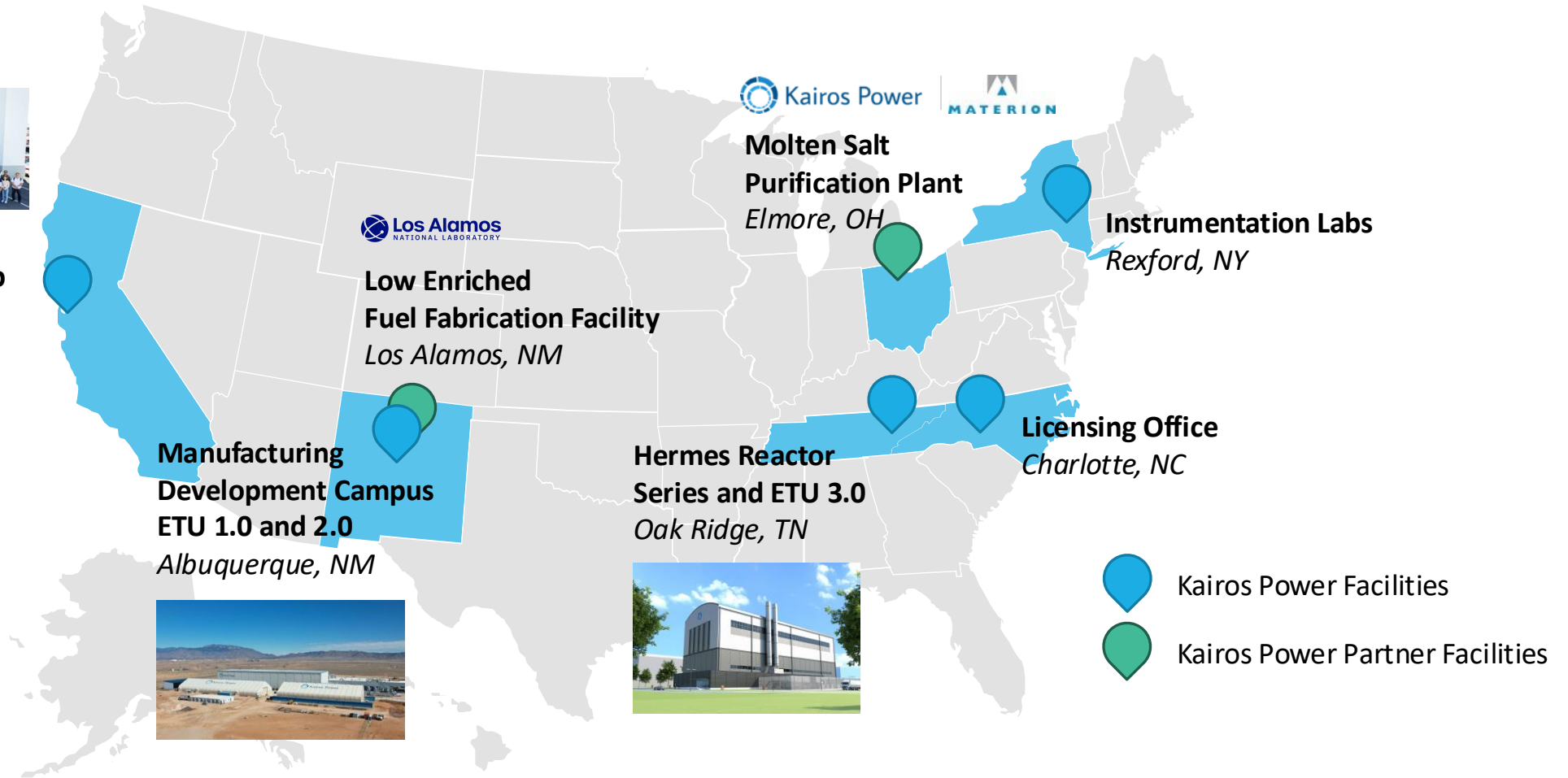
Successive Large-Scale Integrated Demonstrations



Kairos Power Locations and Infrastructure



Headquarters
RAPID Lab / Salt Lab
Alameda, CA



Manufacturing

Vertical Integration



Kairos Power Manufacturing Development Campus
Albuquerque, NM



First U-Stamped Vessel
December 2022



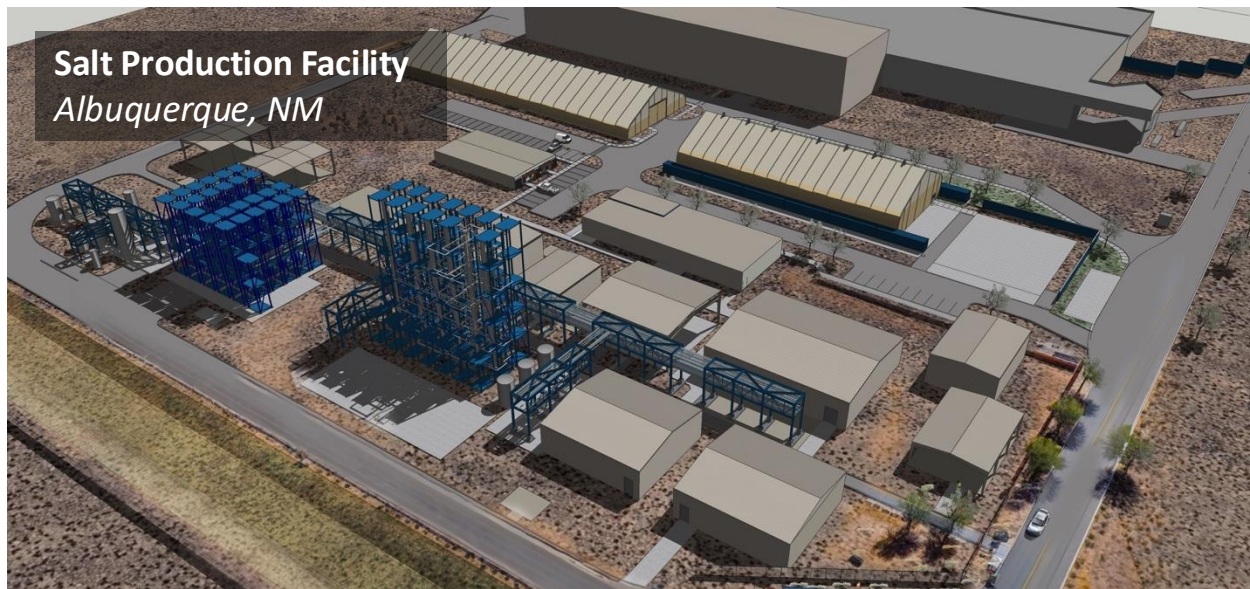
Flibe & Fuel Production

Vertical Integration

Molten Salt Purification Plant
Elmore, OH



Salt Production Facility
Albuquerque, NM



TRISO Development Lab
Albuquerque, NM



Pebble Development Lab
Albuquerque, NM



Engineering Test Unit

Albuquerque, NM



Graphite Reflector Installation



Flibe Arrival



ETU Control Room



ETU 1.0 Testing Progress

2,000+ Hours of Pumped Salt Operations

- **ETU 1.0 testing highlights at 550+°C:**
 - Loaded 12 metric tons of molten salt into the largest Flibe system ever built
 - Demonstrated online refueling with surrogate fuel via the Pebble Handling and Storage System
 - Achieved highest-ever Flibe flow rate up to 3,000 GPM
 - Logged over 25,000 strokes of the Reactivity Control System
 - Commissioned a first-of-its-kind chemistry control system to continuously monitor purity of Flibe in the system



Lessons learned from the ETU program will inform the design and operation of the Hermes demonstration reactor in Tennessee

Engineering Test Unit 2.0

Piloting Modular Construction

- **ETU 2.0** will comprise **30+** subsystem modules
- Skids are being built in Kairos Power's **Modular Systems Facility** in Albuquerque, N.M.
- Designed for ease of transport by truck/rail
- Lessons from ETU 2.0 will inform the modular construction of **ETU 3.0** and **Hermes** in Oak Ridge, Tenn.



Hermes Demonstration Reactor

Oak Ridge, Tennessee



Hermes Demonstration Reactor Series

Leading the Way in Advanced Reactor Licensing

- **Hermes** is the first Gen IV reactor to be approved for construction by the **U.S. Nuclear Regulatory Commission (NRC)** and the first non-light-water reactor to be permitted in the U.S. in over 50 years
- The **Hermes 2 demonstration plant** is the first electricity-producing Gen IV plant to be approved for construction by the NRC
- **Major licensing accomplishments to date:**
 - ✓ **Hermes Construction Permit issued by NRC in Dec 2023**
 - ✓ **Hermes 2 Construction Permits issued by NRC in Nov 2024**
 - ✓ **12 topical reports supporting KP-FHR licensing approved**



Google and Kairos Power Partner to Deploy 500 MW of Clean Electricity

First Corporate Agreement for Multiple Advanced Reactor Deployments

- Kairos Power and Google have signed a **Master Plant Development Agreement**, creating a path to deploy a U.S. fleet of advanced nuclear power projects totaling 500 MW by 2035
- Under the agreement, Kairos Power will develop, construct, and operate a series of advanced reactor plants and sell energy, ancillary services, and environmental attributes to Google under Power Purchase Agreements (PPAs)
- This innovative, multi-plant agreement supports technology development by extending Kairos Power's iterative demonstration strategy through its first commercial deployments



Kairos Power's Commitment to the Community

Embedded in Our Mission

Everything we do at Kairos Power is driven by our mission to **improve people's quality of life while protecting the environment**

Our Commitment:

- Engage and support local communities
- Prioritize diversity, equity, and inclusion
- Selectively build on brownfield sites
- Deliver high energy density with low land use



1 fuel pebble = 4 tons of coal



Headquarters
Alameda, CA



KP Southwest
Albuquerque, NM



K-33 Site
Oak Ridge, TN





Kairos Power

Enabling the world's transition to clean energy
while improving people's quality of life
and protecting the environment