

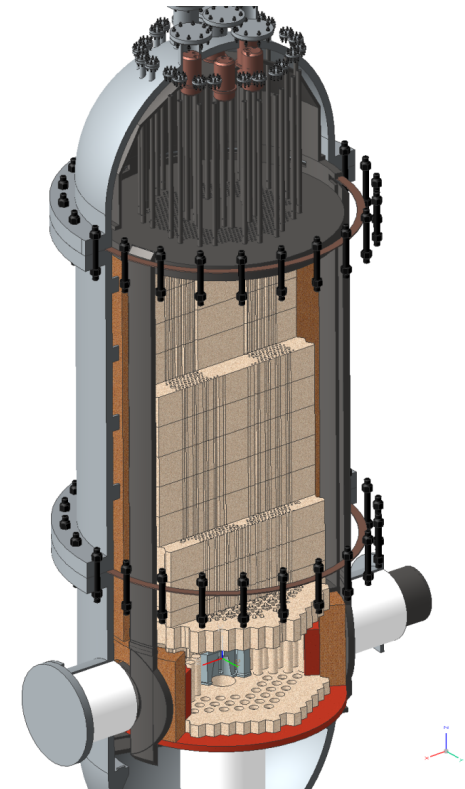


Oregon State University High Temperature Test Facility (HTTF)

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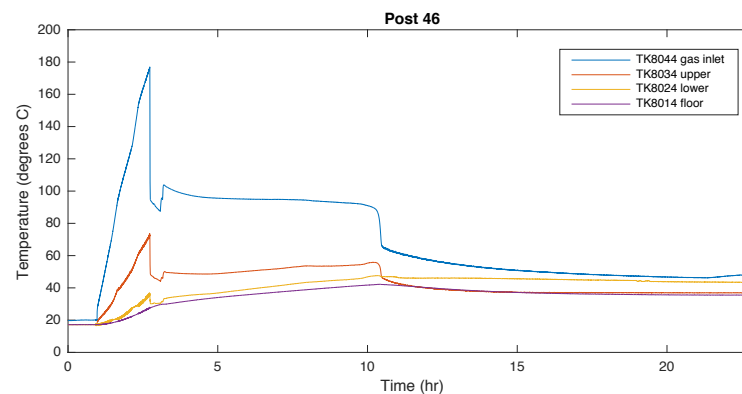
The OSU High Temperature Test Facility

- **High Temperature Test Facility**
 - **Provide data for system code validation.**
 - **Primarily designed to model the depressurized conduction cooldown transient.**
 - Variety of break size and location.
 - Four distinct phases.
 - Reactor Cavity Cooling System as boundary condition.
 - Modular design to allow for the examination of different core types.
 - **Other scenarios examined for applicability of facility.**
 - Pressurized Conduction Cooldown.
 - Normal operations.
 - **Facility Scaling.**
 - $\frac{1}{4}$ length scale.
 - $\frac{1}{4}$ diameter scale.
 - Reduced pressure.
 - Prototypical temperature.
- **Reference Design**
 - **Modular High Temperature Gas Reactor.**



Ongoing/Previous Work

- **Validation data acquisition in HTTF during PCC events—NEUP (Fall 2016)**
 - Lead: George Washington University.
 - Employ molecular tagging velocimetry at the HTTF to visualize high temperature gas flow mixing in the outlet duct during the DCC event and in the upper plenum during the PCC event.
 - Conducted 5 Lock Exchange and Gas Diffusion Test—ambient and 125°C T_{ave} .
- **HTTF Testing Program—INL (Spring 2017)**
 - Lock Exchange and Gas Diffusion Tests.
 - 125°C T_{ave} .
 - 250°C T_{ave} .
 - 375°C T_{ave} .
 - 500°C T_{ave} .



Future Planned Work

- **Currently in Maintenance Outage (Summer 2017).**
 - Heater failures.
- **HTTF Testing Program—Low Power (<700 kW) Testing (Fall 2017)**
 - Double Ended Inlet-Outlet Crossover Duct Break.
 - Control Rod Drive Nozzle Break.
 - Inlet Crossover Duct Break.
 - Double Ended Inlet-Outlet Crossover Duct Break with degraded RCCS.
 - Complete Loss of Flow.
 - Complete Loss of Flow with degraded RCCS.
 - Outlet Crossover Duct Break.
- **Full Power (2200 kW) Shakedown Testing (Fall 2017)**
- **NEUP Testing Program (Winter through Fall 2018)**
 - Eight tests in cooperation with Areva.
- **Pebble Bed Testing—X-energy (starting Fall 2018)**
 - Reconfigure core to pebble bed.

HTTF User Access

- **HTTF currently employed out through 2021.**
- **Contact OSU for use of facility.**
- **Availability is based on—**
 - Employment schedule.
 - Availability of NQA-1 trained staff, operators and configuration.
 - Funding.
 - Staff.
 - Electricity.