

eVinci™ Microreactor

eVinci is a next-generation microreactor
delivering clean & reliable energy for the 21st century

eVinci Microreactor Overview and Fiber Optic Sensor Benefits

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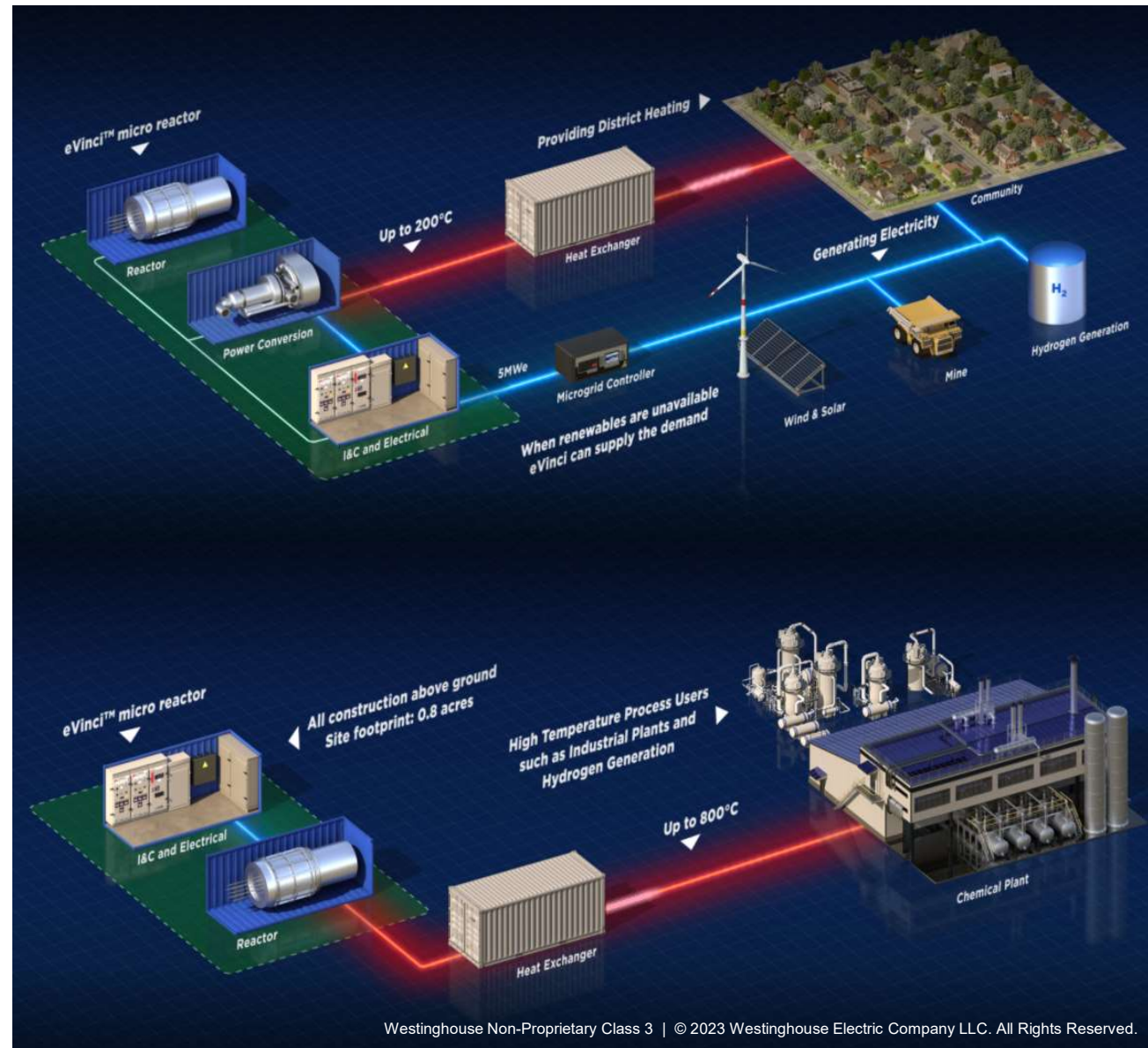
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Deployment Vision

Nuclear battery designed for safe and reliable electricity and heat

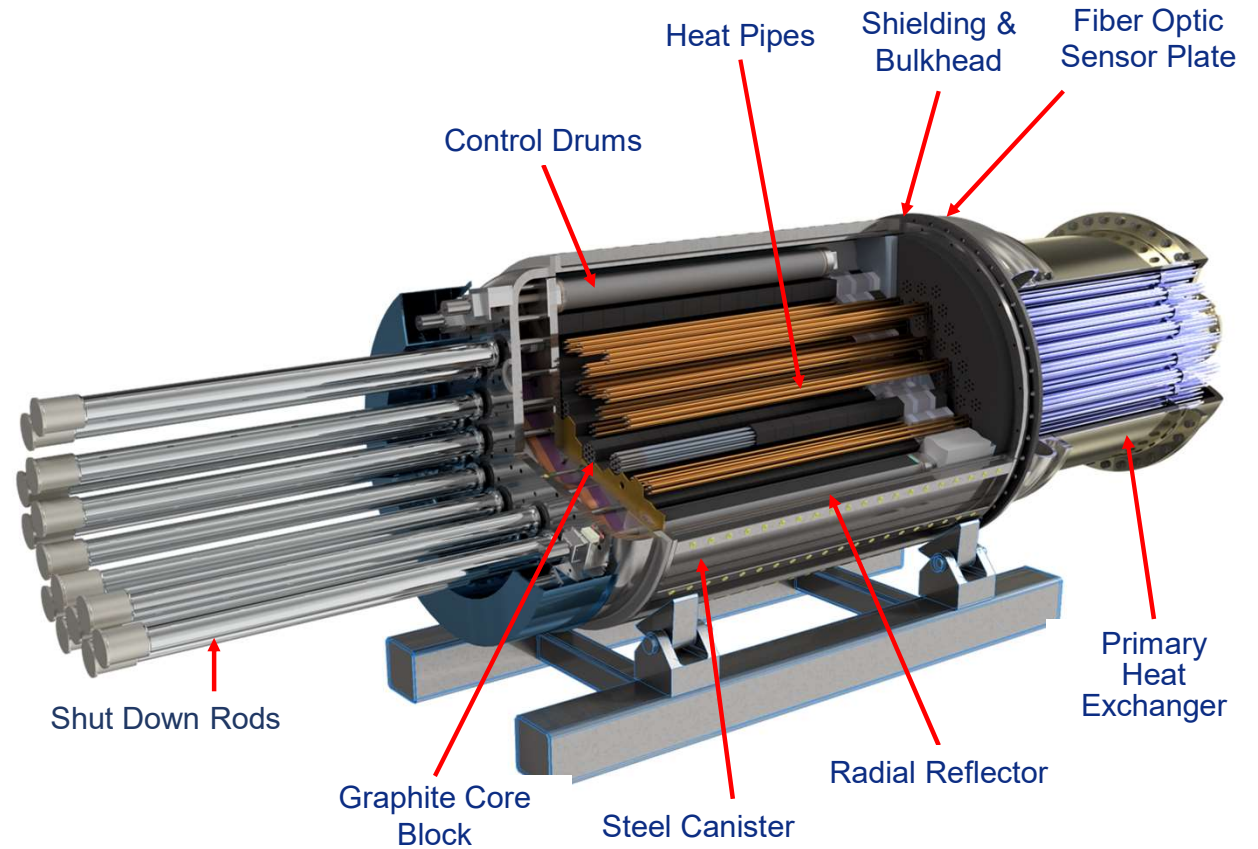
- 15 MWt reactor
- Effective cogeneration nuclear battery
- 8 year refueling cycle
- Transportable for ease of installation & elimination of spent fuel storage on site
- Cost-competitive plant lifecycle
- Minimal onsite personnel
- Mature technology, manufacturing, and regulatory readiness
- High speed load following capability
- Versatile and flexible open-air Brayton power conversion
- No onsite cooling water required



The eVinci Microreactor

Safety through passive heat pipe technology, enabling a very low-pressure reactor

Parameter	eVinci
Power	15 MWt
Fuel Cycle	8 years
Fuel (Enrichment)	TRISO (19.75%)
Coolant	Heat Pipes
Reactor Pressure	~1 atm
Moderator	Graphite
Power Conversion	Open-Air Brayton
Efficiency	34%
Decay Heat Removal	Radial Conduction

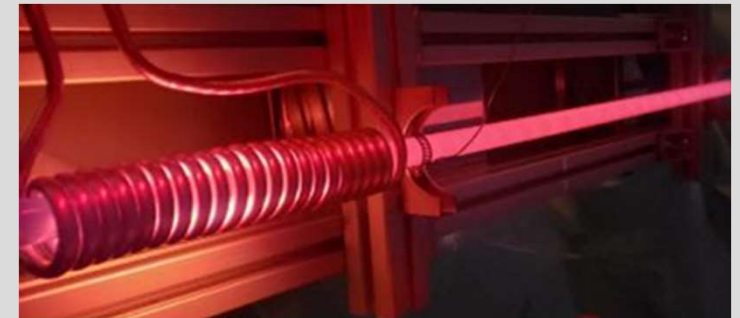
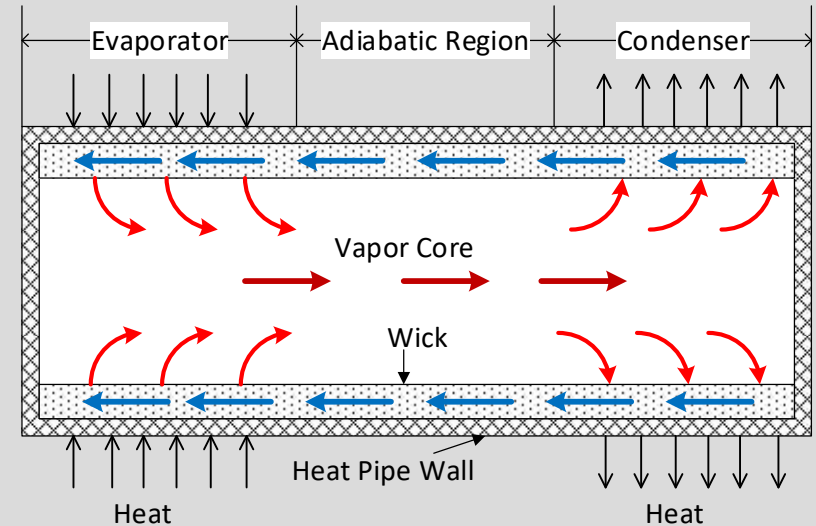


eVinci Microreactor

Why Heat Pipes?

- Heat pipes (HPs) are passive heat transport devices
- HPs eliminate need for reactor coolant pumps, RCS, primary coolant chemistry control and all associated auxiliary systems
- No cooling water required
- HPs are self regulating
- Commonly used in industrial processes

Westinghouse has developed industry leading heat pipe manufacturing and testing processes



eVinci Microreactor Safety Related Sensors

Robust Sensors for Reactor Process Measurement

Instrumentation

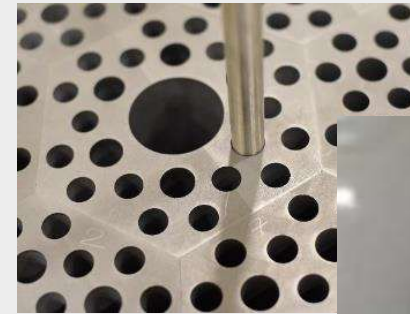
- eVinci implements sufficient instrumentation for autonomous operation
- Instrumentation has high reliability, high spatial resolution, qualified for nuclear safety related use

Core Sensors

- Fiber optic sensors for heat pipe temperature measurement
- Source range and power range neutron flux detectors

Challenges for Sensor Development

- High operating temperature
- I/O density, footprint considerations
- New reactor type
- High reliability



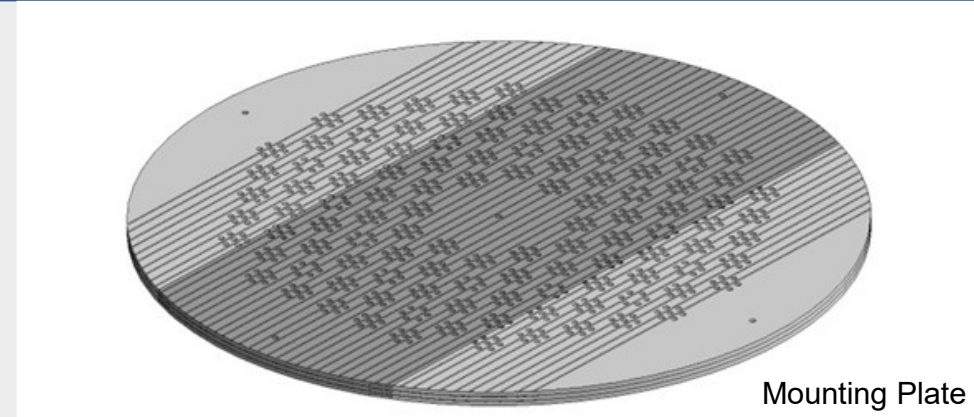
Testing, analysis and regulatory engagement required for FOAK eVinci sensor technologies

eVinci Microreactor Fiber Optic Sensors

Design and Testing

Fiber Sensor Design & eVinci Application

- Sensors are sealed in capillary tube
- Capillary tube installed in mounting plate
- Mounting plate in adiabatic region of eVinci reactor assembly



Westinghouse High Temperature Testing

- Two tests at 900C-1000C completed to date
- 3rd test in initial test setup and shakedown phase
- Third test at 900C, will include a seismic test
- Irradiation tests, formal qualification planned



Autonomous Operation & Predictive Maintenance

Fiber Sensors Enable eVinci Deployment Vision

Autonomous operation with limited on-site staff

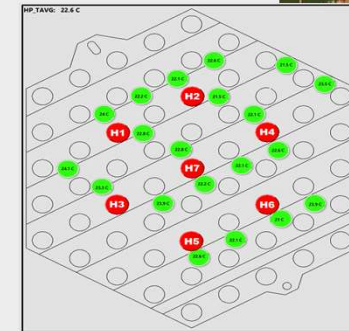
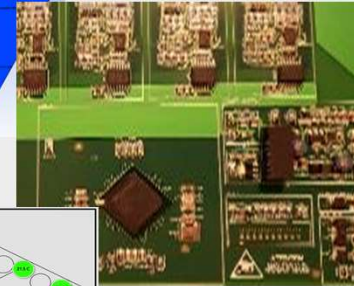
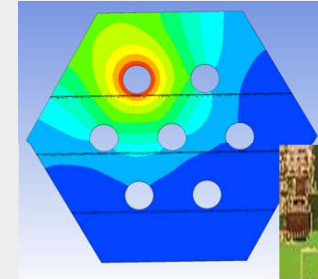
- Significantly reduces operating cost and LCOE

Remote monitoring capabilities enable

- Predictive analytics and predictive maintenance capabilities
- Data collection for big data and machine learning

Reducing the reliance on human operators and technicians

- Reduces O&M costs through predictive vs. prescribed maintenance
 - Reduced inventory cost of spare parts
- Reduce downtime of critical power infrastructure
- Enables remote locations where travel or logistics are difficult



Autonomous operation and predictive maintenance is possible with key enabling technologies and regulatory engagement

Thank You!

www.westinghousenuclear.com

See our Navigator for more information on the eVinci microreactor and all Westinghouse technology

<https://navigator-voyantstudios.com/>

