

# Westinghouse eVinci™ Micro-Reactor Program

GAIN-EPRI-NEI-US NIC Micro-Reactor Workshop  
Idaho National Laboratory  
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Global Technology Office

Westinghouse Electric Company LLC

[www.westinghousenuclear.com/New-Plants/eVinci-Micro-Reactor](http://www.westinghousenuclear.com/New-Plants/eVinci-Micro-Reactor)

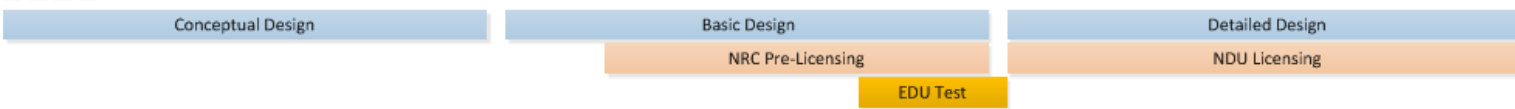
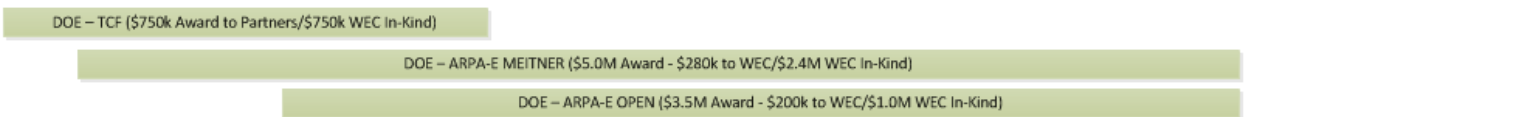
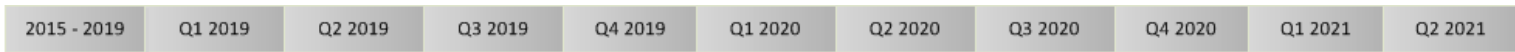


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# Westinghouse eVinci™ Micro Reactor

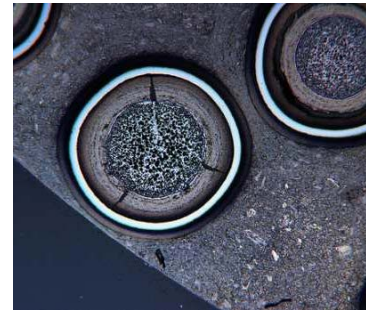
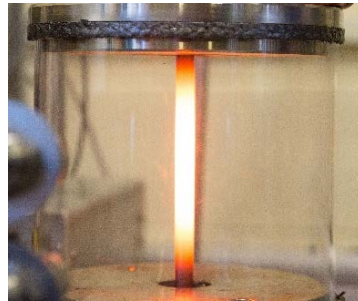
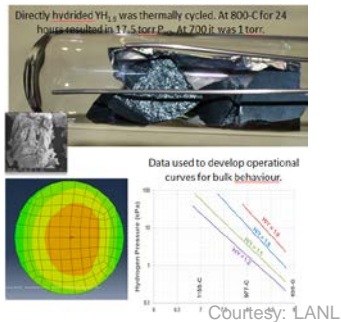
Redefine Nuclear Industry and Reinstate U.S. Leadership

- ✓ **Size:** 1.9 MWe Heat pipe reactor, 3 MWth district heat
- ✓ **Construction:** Factory built, assembled, fueled and tested
- ✓ **Transportable by:** Road, rail, sea and air
- ✓ **Location Independent:** Ambient air heat rejection
- ✓ **Zero EPZ:** Small exclusion zone
- ✓ **Lowest Proliferation FOM**
- ✓ **Semi-autonomous Operation:**
  - Self regulating core and heat pipes
  - Advanced I&C system
  - Passive and Automatic shutdown



Nuclear Demonstration-2023

# eVinci™ Micro Reactor - Specific Needs



Courtesy: World Nuclear News



Courtesy: VW

## Nuclear Criticality Data via testing

- Reduce design uncertainties
- Nuclear data from criticality tests in Epithermal/Cadmium energy neutron flux range
- Neutron scattering data
- **Advanced high temperature metal hydride moderator:** Dynamic simulation of hydriding and dehydriding during reactor transients

## High Temperature Materials and Sensors Data

- Sensors: Have 650°C data; Need 850°C data
- Irradiated TZM creep characterization data
- ASTM code development

## HALEU/TRISO Fuel Supply

- eVinci core only needs <600 Kg HALEU TRISO
- Demonstration reactor may require less
- 19.75% enriched with U-235

## Pilot Assembly line

- Modeling and Simulation
- Assembly Line pilot
- Inspect-ability and repeatability
- Cost and Quality Control
- Regulatory Assessments

# Micro Reactor Needs (Technology Agnostic)



Courtesy: INL

## Micro Grid Integration Test Platform

- Operate with other generation technologies
- Remote monitoring
- Operator training



Courtesy: INL

## Impact Limiter Qualification

- Impact limiter qualification needed for every transportable micro-reactor



## NRC/DOT/DHS Standard for Micro Reactor Transportation

- Does 10CFR71 and 10CFR73 apply?



## External Hazards Identification Standard

- Earthquakes, tsunamis, EMP attack, GMD, fire, flood, weapons attack?



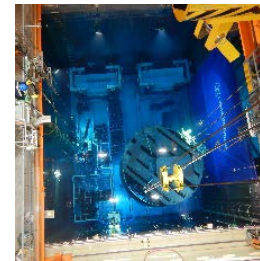
## NDU Site + DOE Regulatory Assistance

- Site Identification and Evaluation
- DOE regulatory support in review of CSDR and SDS



## Supercomputing Platform to run Coupled Design M&S and Safety Analysis Tools

- Coupled modeling and simulation requires large clusters
- 1,000's of cores per simulation



## Refueling, Handling and disposal of used Micro Reactor

- Refueling operation in factory
- Used fuel and activated materials disposition



## NRC Regulatory Engagement Assistance

- Pre-licensing and licensing funding assistance for FOAK micro reactors
- Standardized reg guides for micro reactors