

Westinghouse New Reactors Technology

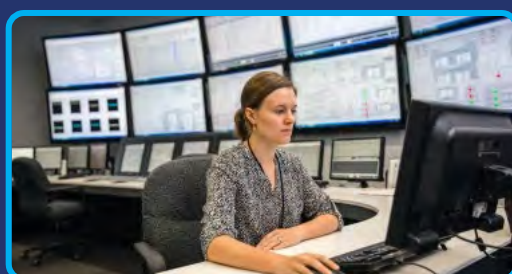


Tim Meyers

Taiwan Account Manager

Westinghouse Advantage

Over **70** years of experience developing & implementing new nuclear technologies that enable reliable, clean, safe and economical sources of energy for generations to come.



10,000 employees located in 21 countries



3 global best-in-class nuclear & fuel manufacturing facilities



~50% of the world's nuclear power is generated using our technology



1ST successful deployment of Gen III+ reactor technology



Technology & Services Portfolio



AP1000[®]
(~1,200 MWe)



AP300[™]
(330 MWe)



eVinci[™] Microreactor
5 MWe

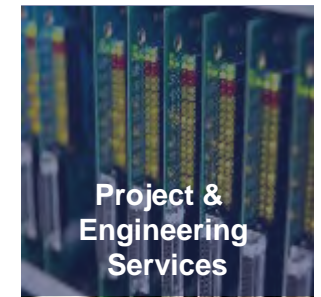
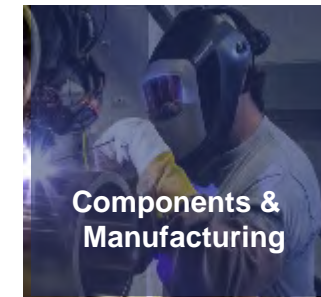
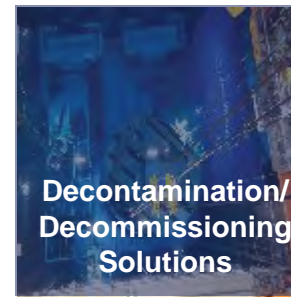
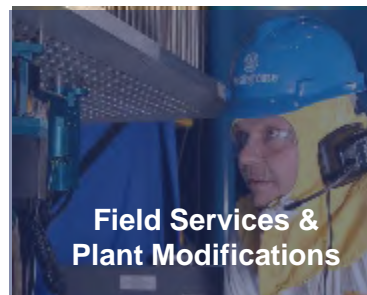


**Long Duration
Energy Storage**

Nuclear Fuel

Operating Plant Services

Environmental Services

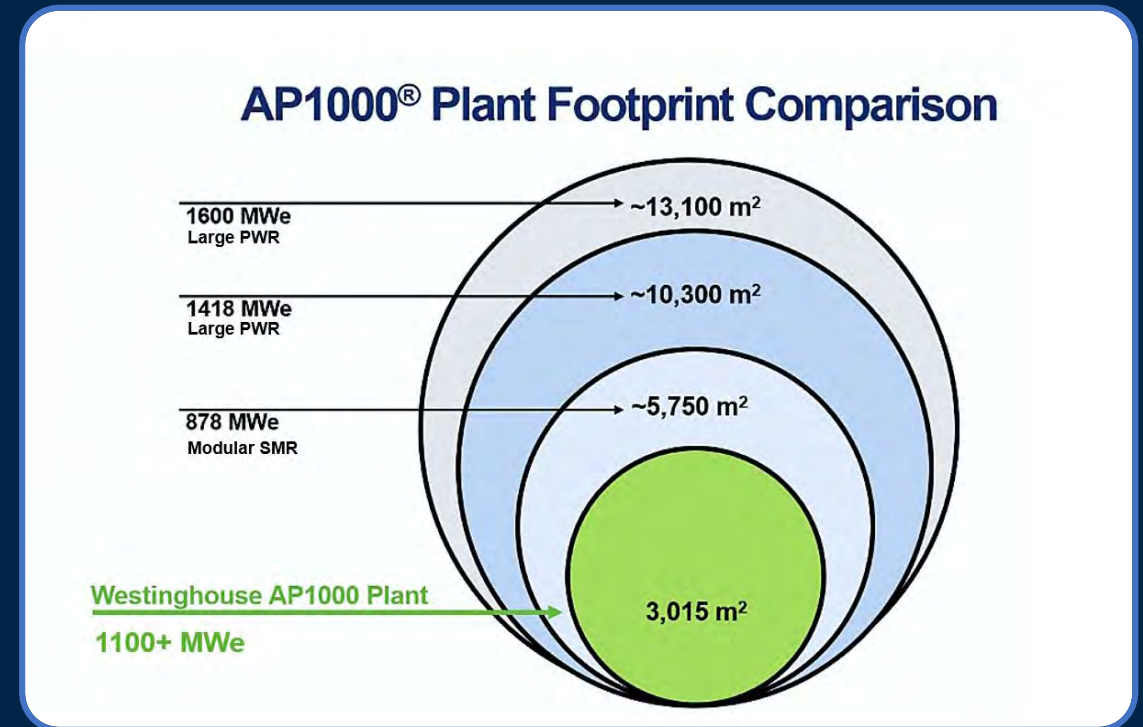


AP1000 Technology

Safe, Simple, Proven

- **Generation III+ plant; most advanced in operation today**
- **Fully passive safety systems and 72+ hour coping after station blackout**
- **Standardized, optimized design utilizing advanced modular construction**
- **Licensed by nuclear regulators in Europe, USA, and China**
- **Record-setting operational performance**
- **Advanced, load-following capabilities**
- **Safe, clean, reliable energy**

AP1000 Plant Footprint Comparison



AP1000 Technology

Record Setting Operations



- Superior operating performance – availability and capacity factors >92%
- Dramatically reduced start-up test programs from 10 months to 5 months or less
- Industry performance records set for first cycle refueling outages (28 days) second cycle (19 days)
- Plants used for both baseload and load-follow modes with ramp rates of 1 MW/second
- Sanmen units received a perfect score by the World Association of Nuclear Operators (WANO)

Customer Selection of Westinghouse New Plant Technology

CUSTOMER CHALLENGES



Emission-free
Energy



Energy
Security



Energy Price
Stability



Grid
Stability

CUSTOMERS CONTINUE TO SELECT WESTINGHOUSE

AP1000 PWR



China has **4 AP1000 reactors** in operation & **12 units** under construction



Poland contracts for **3 AP1000 reactors**



Bulgaria selects **2 AP1000 reactors**



2 operating AP1000 reactors
1st new in USA in 30 yrs



Ukraine contracts for **9 AP1000 reactors**



India selects **6 AP1000 reactors**

AP300 SMR



UK selection – **4 AP300 SMRs**
Community Nuclear Power

Long Duration Energy Storage



US DOE selection – Alaska grid-scale
LDES project at **50 MW & 1.2 GWh**

eVinci Microreactor



Canada selection – **1 eVinci microreactor**
SRC demonstration plant project at **5 MWe**



AP300TM SMR

The ONLY SMR based on Nth of a Kind Operating Plants



AP300 SMR

Only SMR based on deployed, operating & advanced reactor technology



Proven Technology

21 AP1000 reactor-years of safe operations

Based on the fully licensed & operating AP1000 technology.



Advanced Safety

More than **30** years licensing advanced passive technologies with global regulators

We pioneered passive safety systems. AP300 utilizes identical passive safety systems used in the AP1000 reactor to maintain safe shutdown condition.



Readily Deployable

Approximately **0.4** acres needed for safety related buildings

Ultra-compact, simplified design reduces construction timeframes. Maximizes use of established supply chain.



Proven Technology

Leveraging AP1000 technology with demonstrated industry leading reliability



330MWe (999MWth) 1-loop PWR
with demonstrated reliability



Westinghouse AP1000 reactor
passive safety technology



Reduces overall components
creating a simpler plant compared
to other SMRs



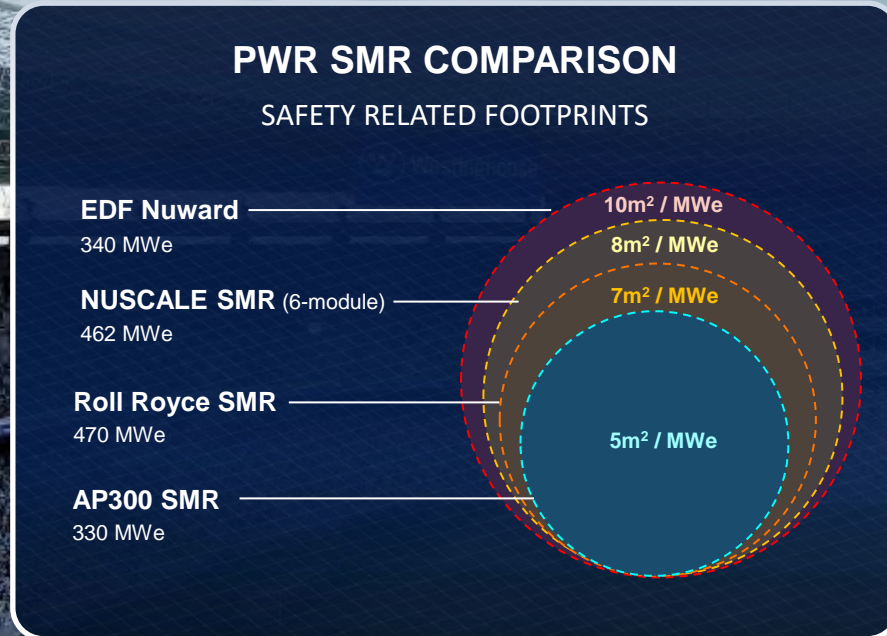
Identical Technology as
AP1000 including:

- | Design & licensing methodologies
- | Major equipment & components
- | Passive safety systems
- | Proven Fuel
- | I&C systems
- | Proven Supply Chain
- | Constructability lessons learned
- | Steel-Composite structural modules
- | O&M procedures & practices
- | Fast load follow capabilities



Ultra Compact Footprint

AP300 SMR's smaller safety related footprint reduces construction, operating & maintenance costs

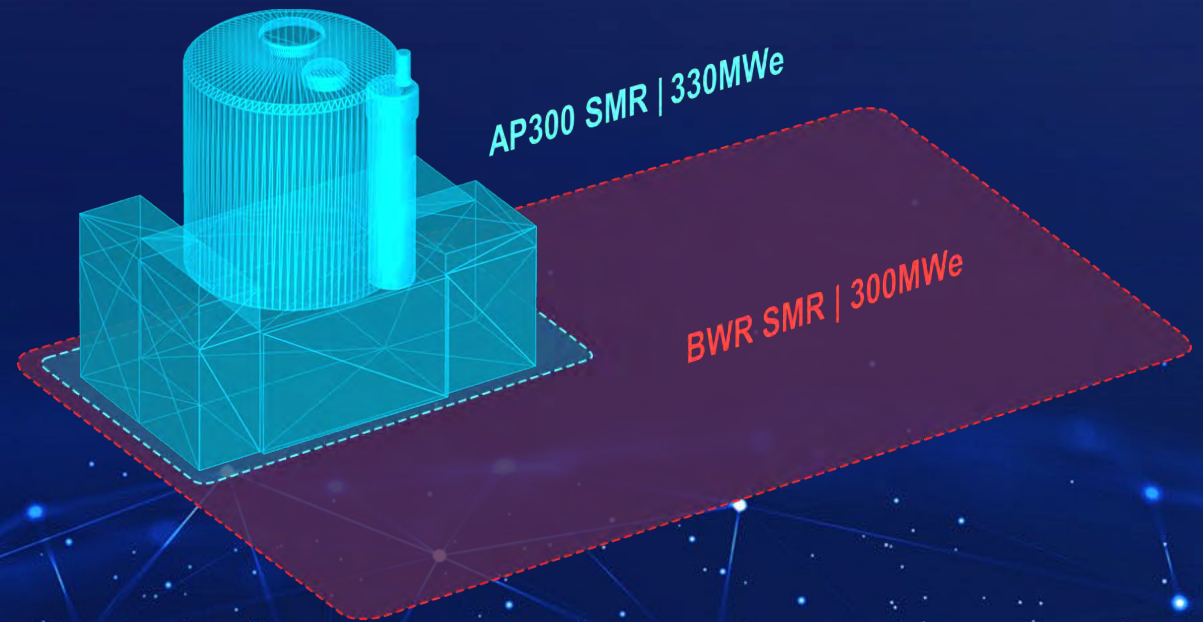


PWR Advantage

Westinghouse PWR technology is the basis for nearly one-half of the world's operating nuclear plants

| Key Factors | AP300 PWR | BWR Technology |
|---|---|---|
| Robust Containment | Protected by a robust containment designed to withstand extreme external hazards. | Equipment used to manage highly radioactive material located outside containment |
| Occupational Radiological Exposure | Minimizes potentially contaminated components & radiologically controlled areas. | Historically workers have received twice the dose due to increased contaminated equipment & a larger radiologically controlled area |
| Application Versatility | AP300 SMR produces non-contaminated & non-radioactive steam without the need for additional equipment | Requires additional equipment to support district heating & other process heat applications |

AP300 Radiological Controlled footprint is ~3X smaller than competing BWR



Occupational Exposures per OECD/NEA Occupational Exposures at Nuclear Power Plants (Twenty-Seventh Annual Report of the ISOE Programme, 2017)

Passive Safety Pioneers

AP300 SMR uses the identical proven AP1000 fully passive safety systems



Fail Safe

Automatically achieves safe shutdown without the need for operator action



Self Sufficient

Passive approach to safety eliminates the need for backup power & cooling supply



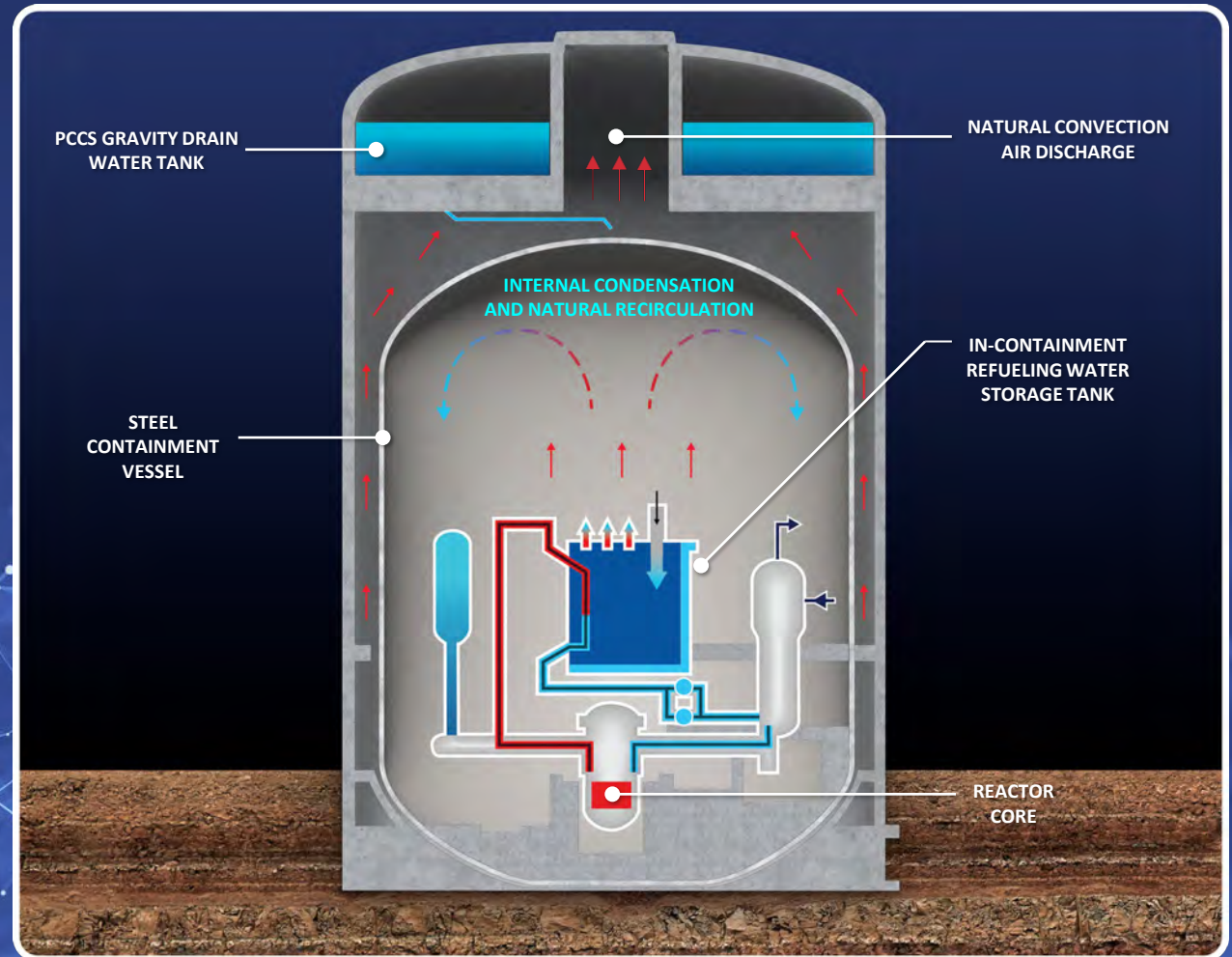
Hazard Proof

Protected by a robust containment designed to withstand extreme external hazards



Defense in Depth

Multiple layers of defense for accident mitigation



Readily Deployable by 2030's

Proven pedigree throughout the plant lifecycle ensures deployment & operations success



Technology Readiness

Tens of millions of hours dedicated to AP1000 reactor development
5 AP1000 reactors operating, 1 nearing completion, more pending



Licensing Certainty

Based on licensed & operating AP1000 technology, the only technology to be fully licensed by the U.S NRC



Established Supply Chain

Incumbent AP1000 suppliers can deliver major equipment
Demonstrated capability to localize supply chain



Modular Construction

Simplified, modular, ultra compact nuclear island (costliest portion of any reactor) reduces construction costs/schedule



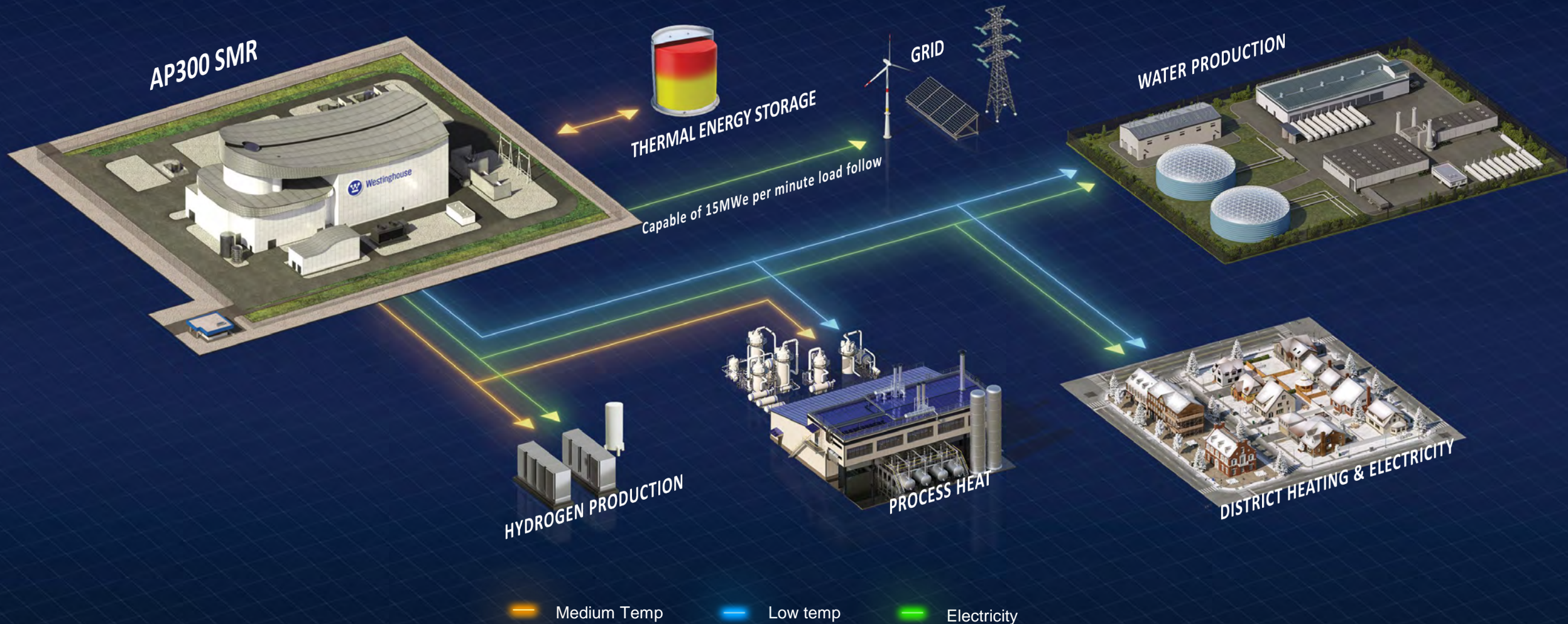
Reliable O&M

Record setting AP1000 operational & outage performance
Targeting **+80-year** life cycle



Versatility of Application

AP300 SMR is the backbone of a community clean energy system



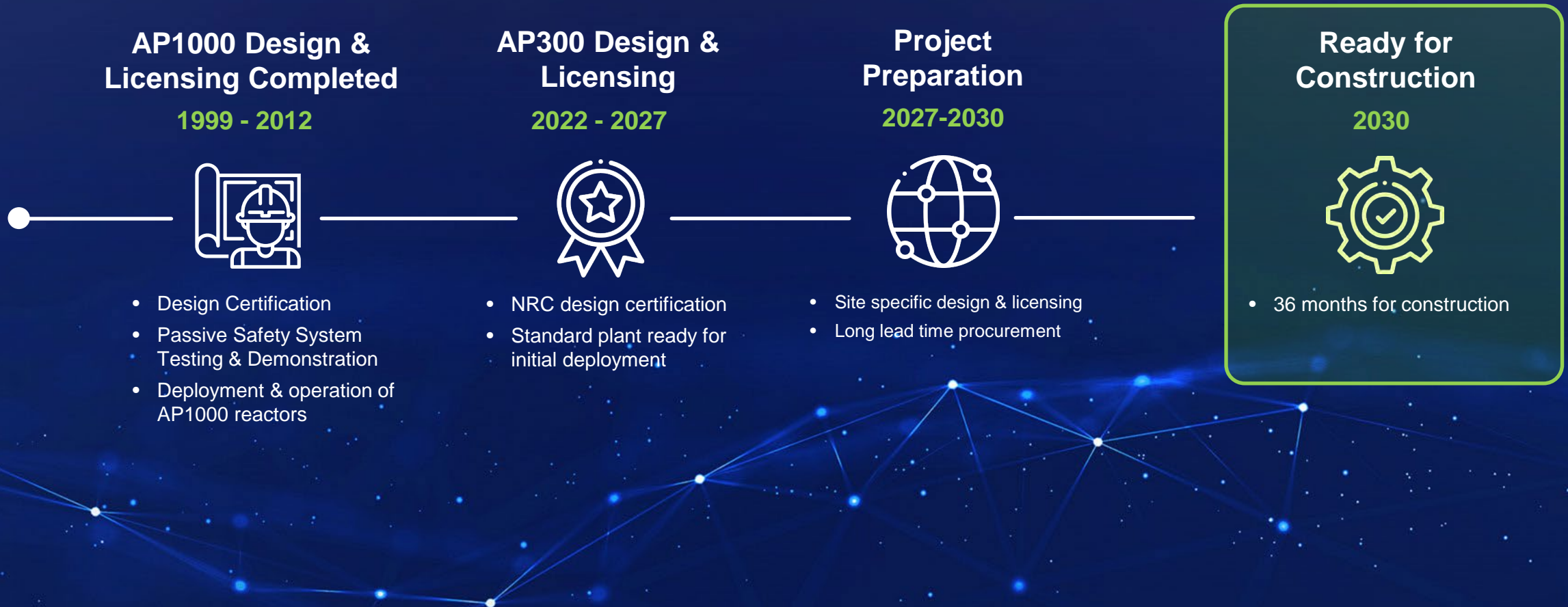
AP300 SMR Advantage

AP300 SMR reduces development risks and increases market potential

| | Key Factors | Competitor #1 | Competitor #2 | Competitor #3 | Competitor #4 | Competitor #5 | Westinghouse AP300 SMR |
|-------------------|---|---------------|---------------|---------------|---------------|---------------|------------------------|
| DEVELOPMENT RISKS | Design & Technology | Low | Medium | Medium | Medium | Medium | Low |
| | Full Licensing | Low | Medium | Medium | Low | Low | Low |
| | Fuel Cycle | Low | Low | Low | Low | Low | Low |
| | Skills Availability & Supply Chain Maturity | Medium | Medium | Medium | Medium | Medium | Low |
| MARKET POTENTIAL | Design for manufacturability & construction | ++ | ++ | + | + | + | +++ |
| | Cost Competitiveness & LCOE | +++ | ++ | + | + | + | +++ |
| | Utility Market: O&M synergies | ++ | + | + | ++ | + | +++ |
| | Versatility: electricity, steam, H ₂ , Storage | ++ | +++ | +++ | +++ | +++ | +++ |

AP300 SMR Roadmap

Leverages our AP1000 reactor design and licensing experience to achieve deployment by early 2030's



Commercial Traction Accelerating Worldwide



AP300 SMR

The ONLY SMR based on Nth of a Kind Operating Plants



Proven Technology



Advanced Safety



Readily Deployable





eVinci™ Microreactor



The eVinci microreactor

Nuclear battery designed for safe and reliable electricity and heat generation

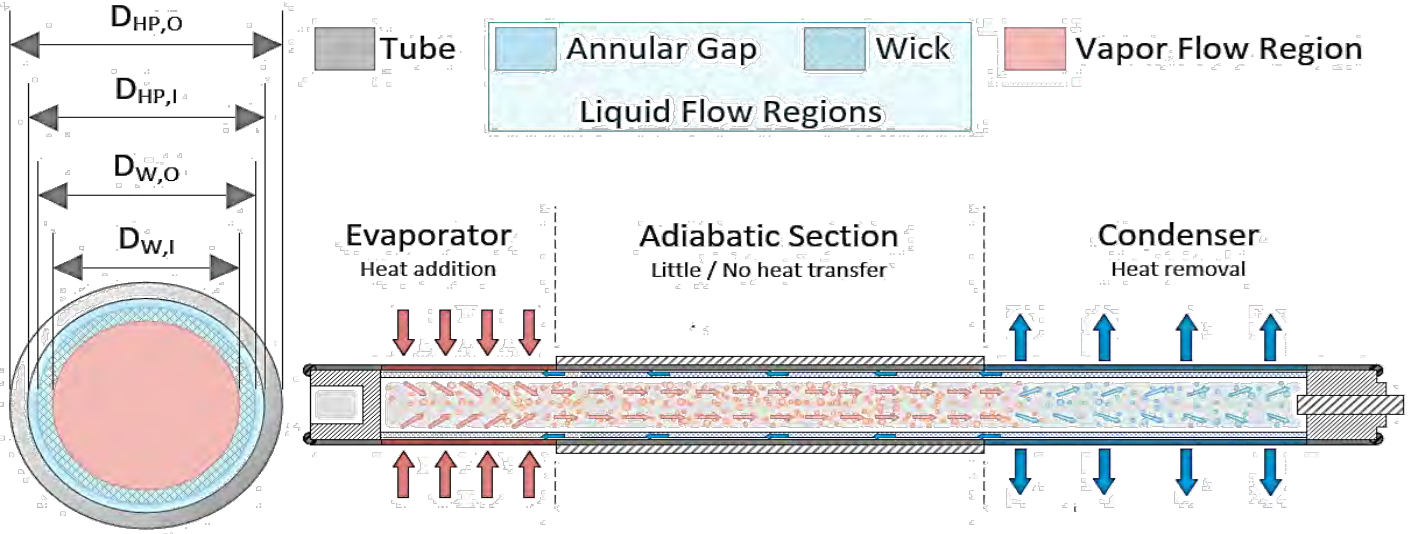
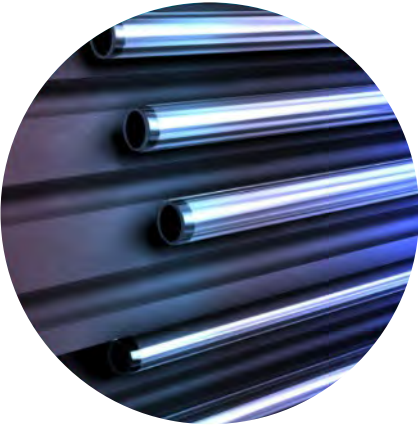
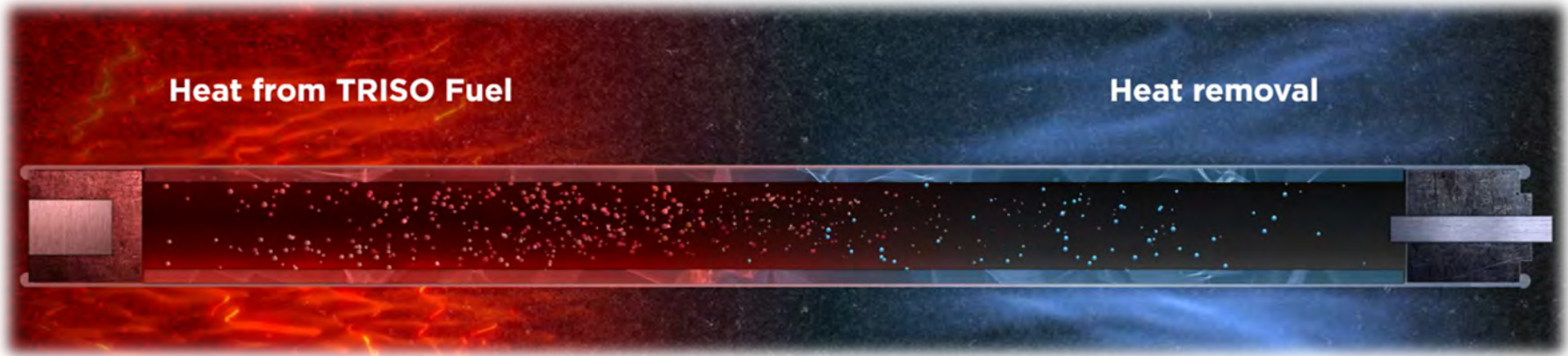
Capabilities and Advantages

- 5 MWe
- Scalable
- 8+ year refueling cycle
- High speed load-following capability
- Transportable
- Eliminates spent fuel storage on site
- Minimal onsite personnel
- Waterless operation
- Mature technology, manufacturing, and regulatory readiness



Heat Pipes Enable the Fission Battery Model

Very Low Pressure • Passive • Isothermal • Self-Regulating



eVinci Site

3-acre, above ground footprint

Security Barriers

Microreactor Replacement Enclosure Bay

Primary Microreactor Unit Enclosure Bay

Power Conversion System

eVinci Microreactor

Instrumentation and Control

Load Following Battery

Designed to Reduce Construction Costs & Promote Sustainability

- No deep **ground excavation**, high seismic compatible (>0.6pga), **no water** resources, and **no radwaste management during operation** as fission products remain trapped in fuel form. **EPZ at site boundary**.
- Radiation shielding designed for safety & cost through a 3-layer approach minimizes activation of structures to allow free release of **site within 3 years after shutdown** with **reactor-fuel being removed in less than 2 years after shutdown**. Low occupational dose limits (<2.5mrem/h) outside the reactor enclosure enable routine work
- **Automatic load follow & safety systems** simplify operational needs. **No high-pressure systems** reduce inspection & maintenance and increase reliability.
- Strategic focus to **reduce safety-related footprint & maintain ground-level construction** for cost reduction. Safety-related structures are only within the basemat underneath the reactor and I&C module/Control Room.

| | |
|--------------------------|---|
| Site Size | 2.5 acre (site-dependent) |
| Electrical Output | 5 MWe at 60 Hz, 3-phase, 4160V |
| Grid Management | Grid Forming or Grid-Following |
| Load Follow | Instantaneous <ul style="list-style-type: none"> • Turbine Bypass for load shed • Battery for <1min during load ramp |
| Operators | 1 on-site 24/7 1 remote supervisor (no controls) |
| Security | 1 on-site 24/7 (integrate-able with base) Supplemental staff during construction |
| Black Start | Reactor is Capable with battery support |

-  **Environmentally Safe & Sustainable**
-  **Easy Operations**
-  **Cost Competitive**
-  **Designed for Safety**



Headlines From eVinci Technologies



First eVinci customer announcement in Saskatchewan with Saskatchewan Research Council



November 27
2023



Opened eVinci Microreactor Accelerator at 51 Bridge St. Pittsburgh, PA



March 4



Completed second phase of electrical demonstration testing



March 28



NTR Preliminary Safety Design Report (PSDR) completed and transmitted to the Idaho National Laboratory



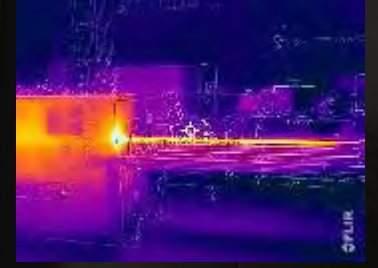
April 12



Full Diameter Reactor Manufacturing Demonstration Unit



July 25



Successfully Tested 12' Heat Pipe



July 29

Manufacturing Demonstration Unit



- *The demonstration unit weighs in at more than **32,000 lbs** with a diameter of more than **3 meters***
- *Utilizes prototypic materials*
- *Proved assembly process*



One step closer to powering our future: 12' Heat Pipe Test

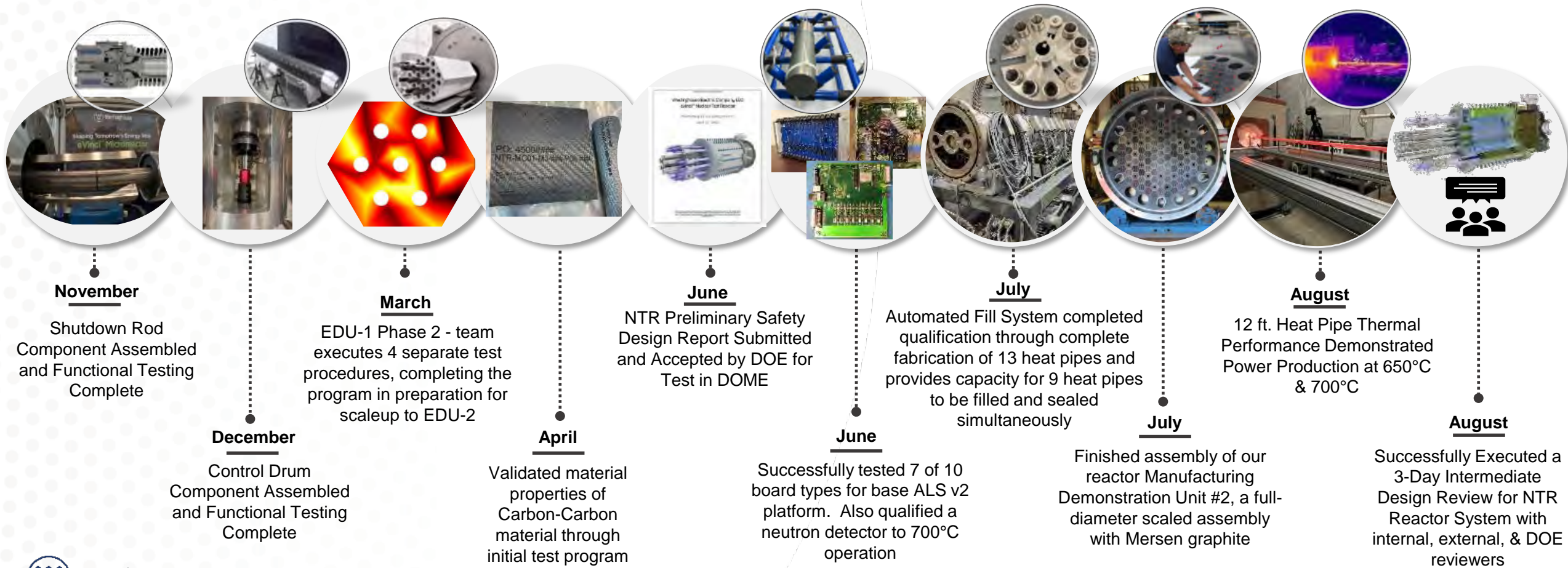


- Westinghouse engineers successfully tested 12' heat pipes, a key demonstration milestone
- Heat pipes are designed to operate at temperatures exceeding 850°C

Farther and Faster in 2024

We are executing on our vision to bring the microreactor to the commercial nuclear market

December U.S. Nuclear Regulatory Commission (NRC) approved the state-of-the-art eVinci™ Advanced Logic System® (ALS) Version 2 (v2) instrumentation and control (I&C) platform through a Final Safety Evaluation Report on two topical reports. First and only microreactor.



eVinci Nuclear Test Reactor

- Operation at Idaho National Laboratory
- Proof of technology prior to commercial operating units
- Finalizing design
- Procuring materials
- Progressing through DOE authorization licensing process



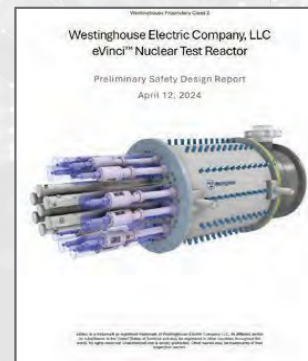
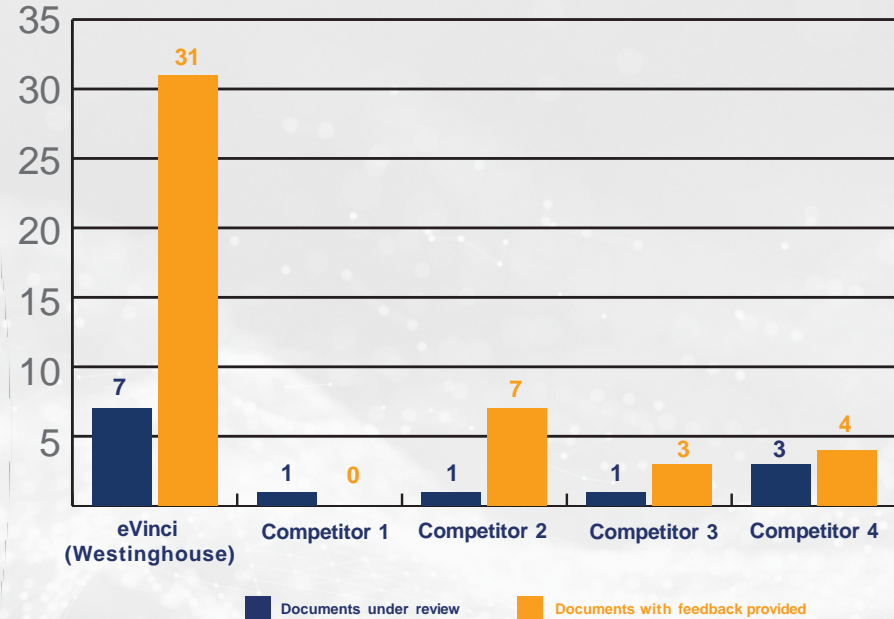
NTR canister material – October 2024



Our Regulatory Readiness Sets a Clear & Predictable Path to Successful NRC Licensing

- Our track-record of success and leadership in regulatory engagement & technology readiness establishes a credible plan
- **Westinghouse was the first** to license & build a Gen III+ plant in our AP1000 product with Vogtle 3&4 in commercial operation
- **First** vendor to present an advanced reactor design to the Advisory Committee on Reactor Safeguards
- **First** to have DOE approve a Safety Design Strategy for an advanced reactor through the National Reactor Innovation Center
- **First** to submit Preliminary Safety Design Report to DOE for a microreactor test in the Idaho DOME
- Westinghouse licensed **58 operating plants** across 10 plant technologies and now adds **eVinci microreactor & AP300** to our portfolio
- The eVinci microreactor has the **most** pre-application technical submittals of any microreactor vendor (<50 MWt)
- The eVinci microreactor includes novel licensing approaches due to unique advantages like a small site EPZ, minimal staffing, and remote monitoring capabilities

Pre-Application Submittals to NRC for Microreactors with Open Docket



Licensing progress and accomplishments

- 34 technical white papers
- 3 topical reports approved
- 3 topical reports in review

Thank You



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