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NuScale Power: The Future of Energy

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Scott Bailey
Vice President, Supply Chain

Acknowledgement and Disclaimer

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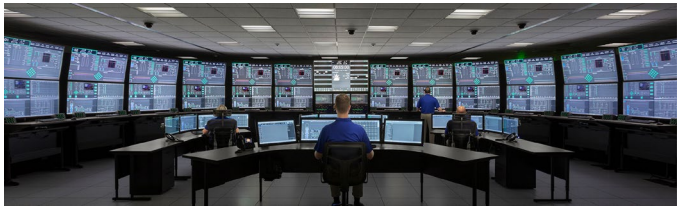
Who is NuScale Power?

- NuScale Power was formed in 2007 for the sole purpose of completing the design and commercializing a small modular reactor (SMR) – the NuScale Power Module™.
- Initial concept had been in development and testing since the 2000 U.S. Department of Energy (DOE) MASLWR program.
- Fluor, global engineering and construction company, became lead investor in 2011.
- In 2013, NuScale won a competitive U.S. DOE Funding Opportunity for matching funds, and has been awarded over $300M in DOE funding since then.
- >530 patents granted or pending in nearly 20 countries.
- >400 employees in 6 offices in the U.S. and 1 office in the U.K.
- Rigorous design review by the U.S. Nuclear Regulatory Commission (NRC) to be completed in 2020.
- Total investment in NuScale to date is greater than US$950M.
- First U.S. plant operation planned for 2027.

NuScale Engineering Offices Corvallis

One-third Scale NIST-2 Test Facility



NuScale Control Room Simulator

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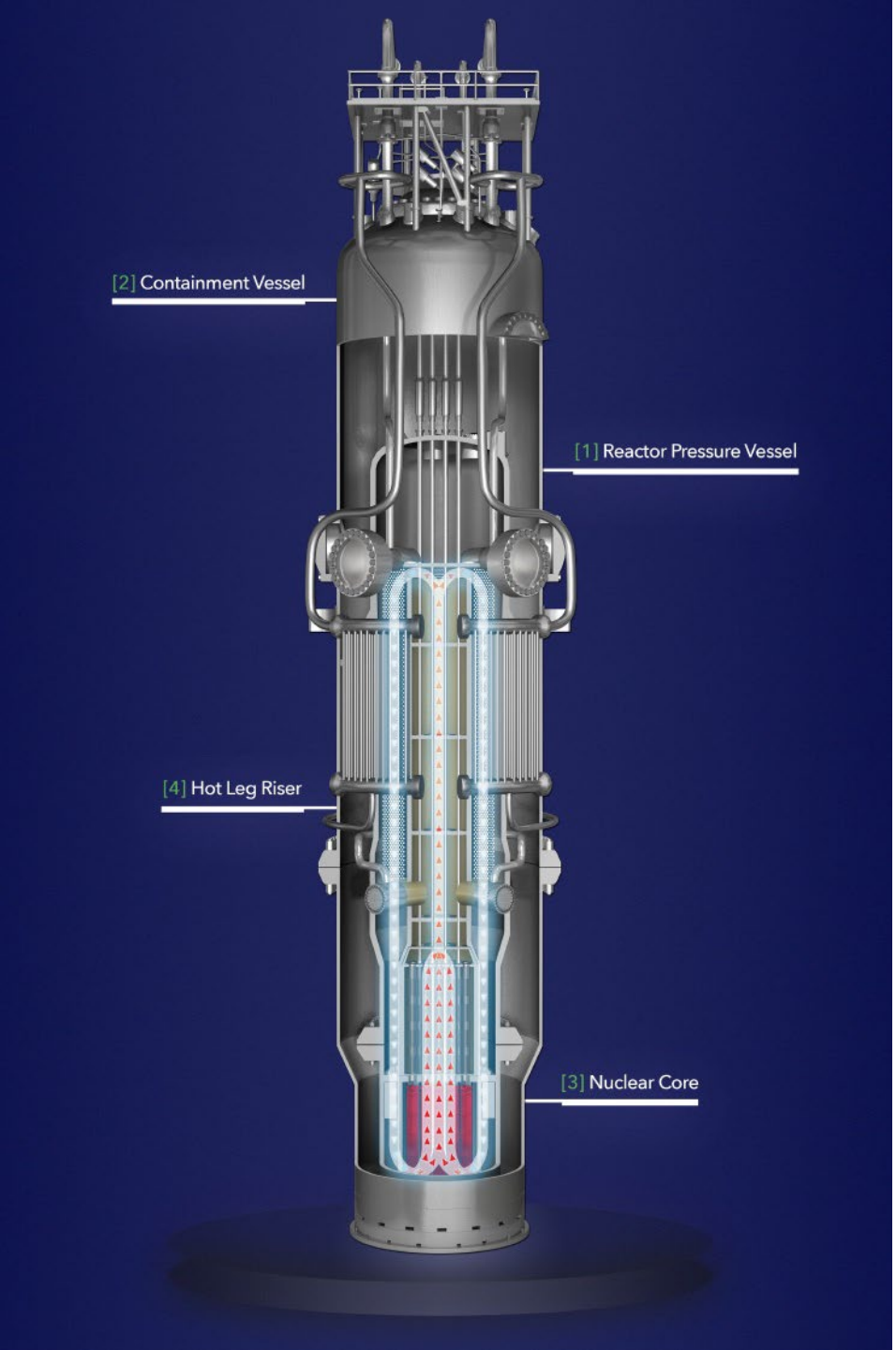

Core Technology: NuScale Power Module™

- A **NuScale Power Module™** (NPM) includes the reactor vessel, steam generators, pressurizer, and containment in an **integral package** – simple design that eliminates reactor coolant pumps, large bore piping and other systems and components found in large conventional reactors.
- Each module produces **up to 60 MWe**
  - small enough to be factory built for easy transport and installation.
  - dedicated power conversion system for flexible, independent operation.
  - incrementally added to match load growth – up to **12 modules for 720 MWe** gross (684 MWe net) total output.

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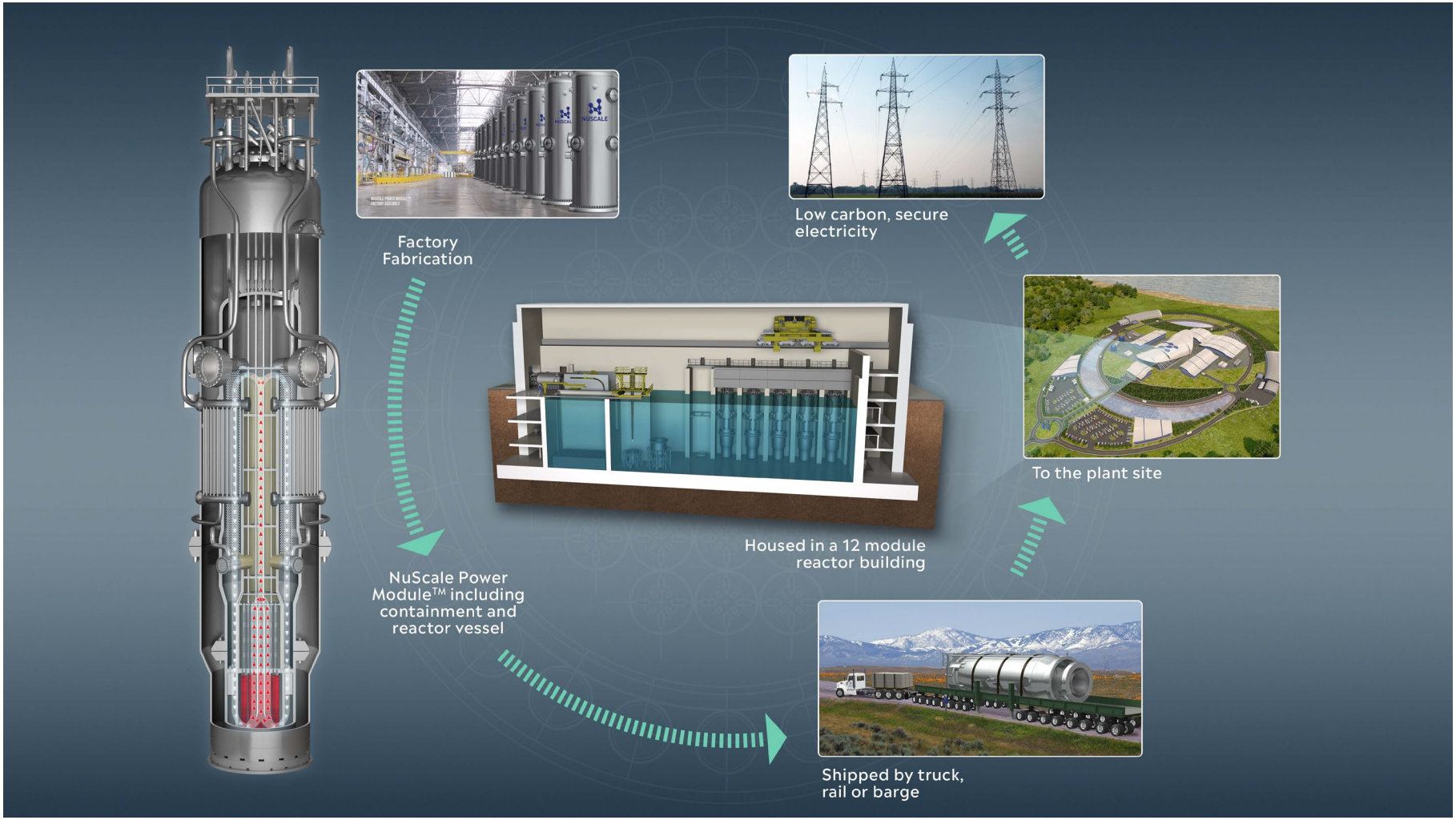
A New Approach to Construction and Operation



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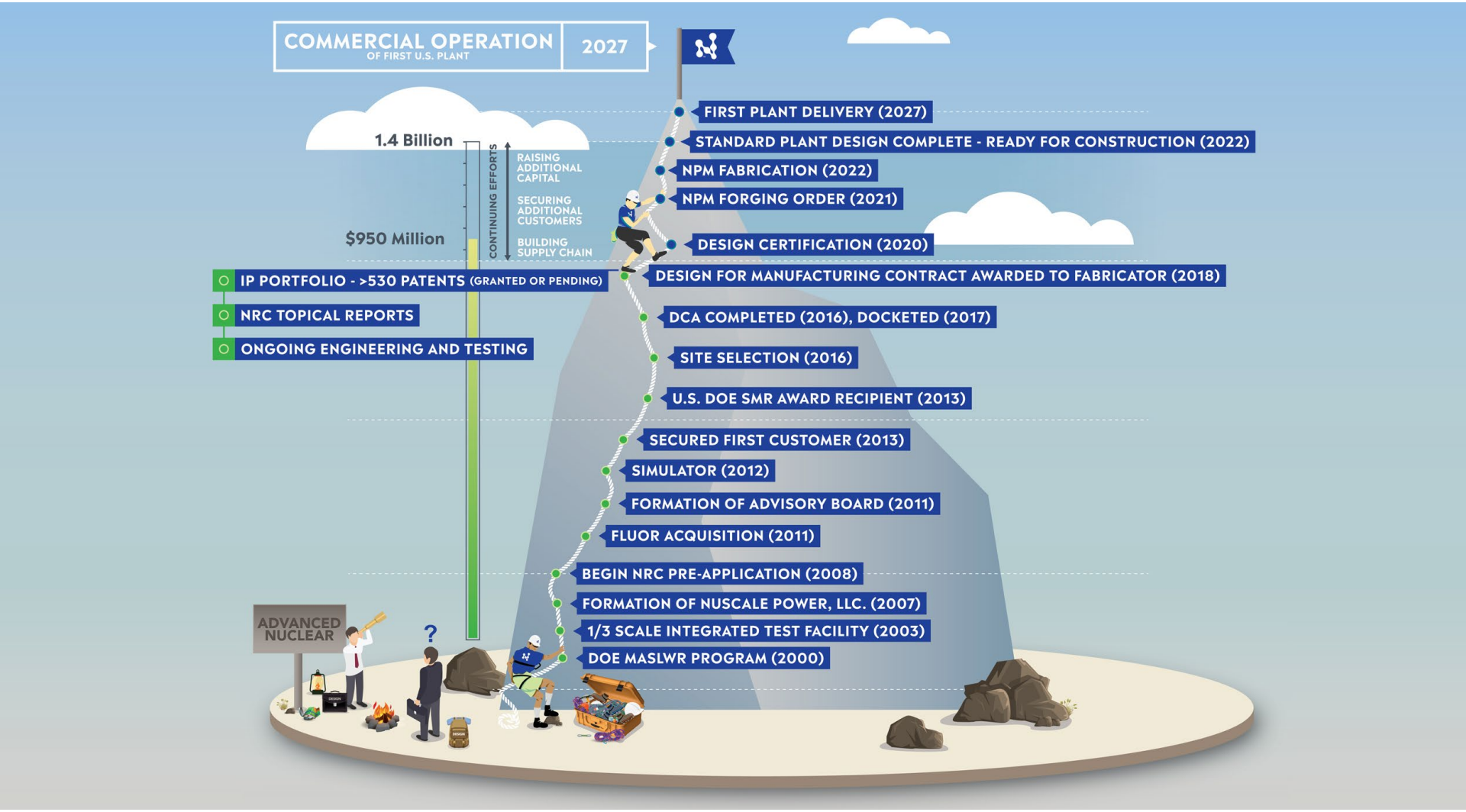
Blazing the Trail to Commercialization



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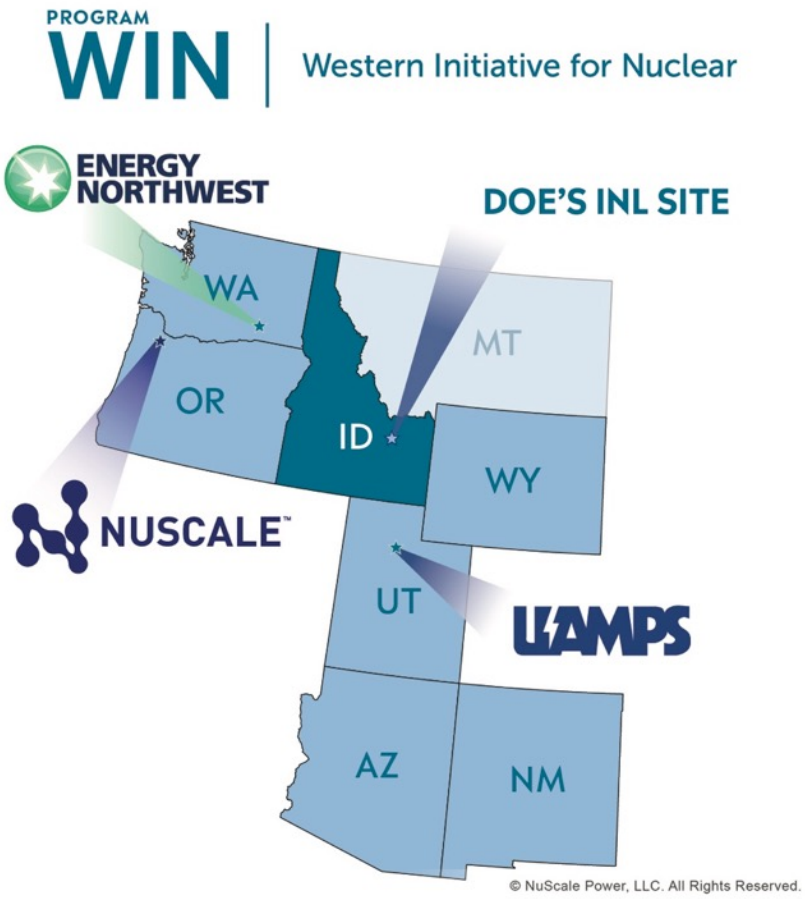
First Deployment: UAMPS Carbon Free Power Project



- Utah Associated Municipal Power Systems (UAMPS) provides energy services to community-owned power systems throughout the Intermountain West
- First deployment will be a 12-module plant (720 MWe) within the Idaho National Laboratory (INL) site, slated for commercial operation in 2027

> "We have three coal plants and two of them already have closure dates. Some of that coal generation will be replaced by energy efficiency, some will be replaced by renewables and the remainder we will replace with [the NuScale plant]."
>
> – Doug Hunter, CEO, UAMPS
>
> *OPB, March 2019*

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International Opportunities

- NuScale made its first submittal to the Canadian Nuclear Safety Commission (CNSC) for pre-licensing vendor design review (VDR) and signed MOUs with Ontario Power Generation (OPG) and Bruce Power.
- NuScale has been actively involved in the United Kingdom's SMR market and continues to support UK government SMR program initiatives.
- NuScale and Nuclearelectrica SA signed MOU to evaluate SMRs for Romania's energy needs.
- NuScale signed MOU with ČEZ Group to explore SMR opportunities in the Czech Republic and broader region.
- NuScale signed MOU with Jordan Atomic Energy Commission (JAEC) to evaluate NuScale's SMR for use in Jordan.
- Many international opportunities for NuScale SMR deployment in Europe, the Middle East, Southeast Asia, and Africa.

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Repurposing Coal Power Plant Sites

- A NuScale plant can be **built on an existing coal power plant site**
  - 720 MWe NuScale plant has a small land footprint of around 30 acres
- Some coal **plant infrastructure can be repurposed and reused**, such as:
  - Cooling water delivery systems, demineralized water, potable water, site fire protection, switchyard, and buildings (e.g. administrative, training, warehouse)
- Capital **cost savings could be approximately $100M** depending on the site
- Each NuScale Plant will employ about **300 people in full-time**, high-paying quality jobs
  - Many positions are directly transferable from coal to nuclear, other positions can move into NuScale power plant jobs with cross training

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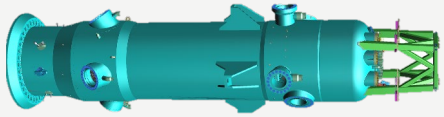
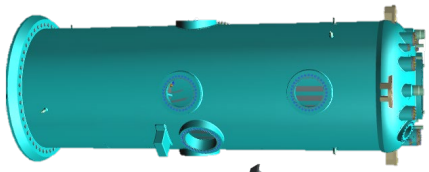
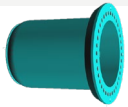
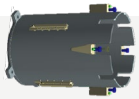
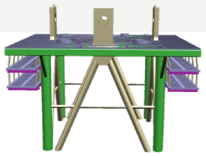
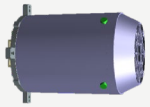
Assumed NPM Configuration On Arrival

Component	Weight	Limiting Dimension
	195 tons	13’ 10-3/4” – steam plenums
	208 tons	18’ 8-3/4” - seismic lugs (requires utility support to transport)
	100 tons	18’ 1-3/4” – main flange (requires utility support to transport)
	47 tons	12’ ¾” – main flange
	31 tons	7’ 11” – support blocks
	29 tons	18’ 7-3/8” – top frame
	8 tons	7’ 10-3/4” – lower core plate

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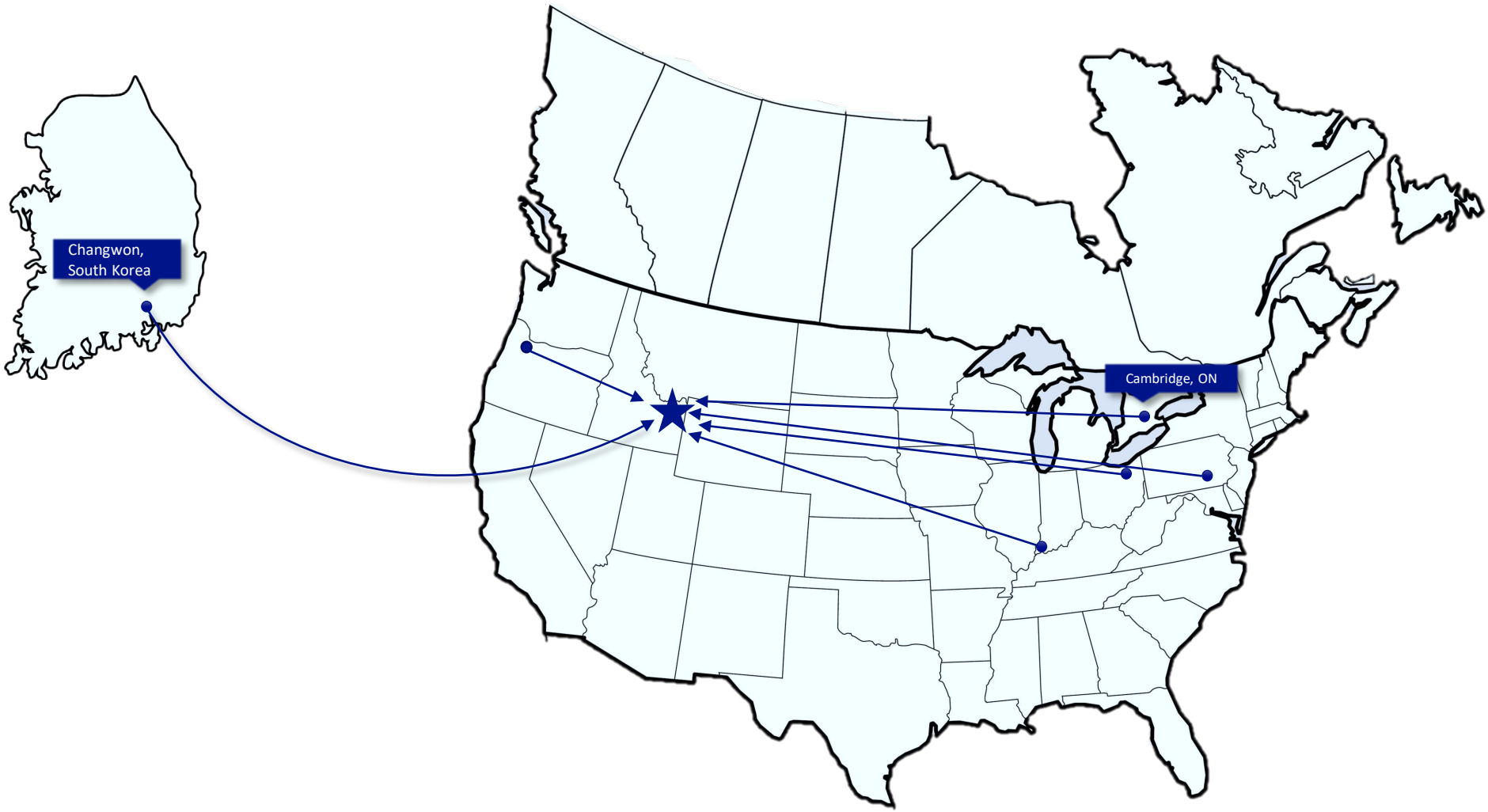
NPM Transportation



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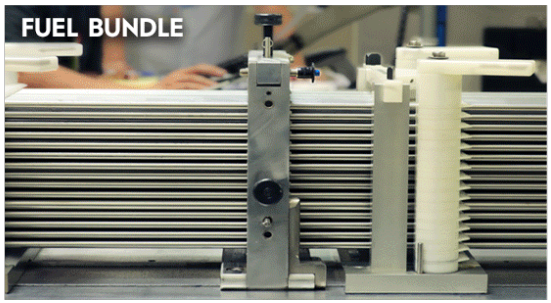
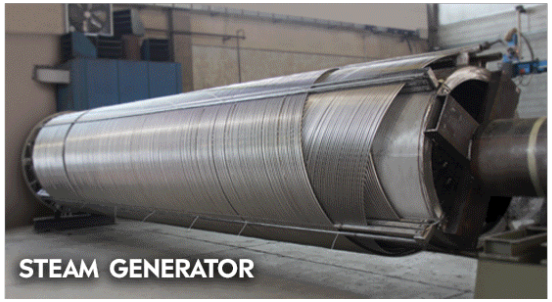
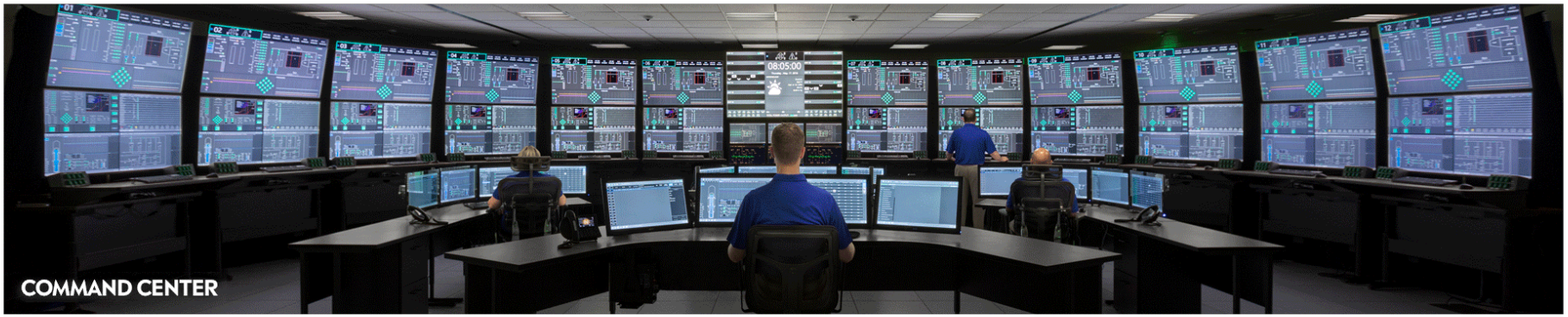
The Future of Energy is Here







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sbailey@nuscalepower.com

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