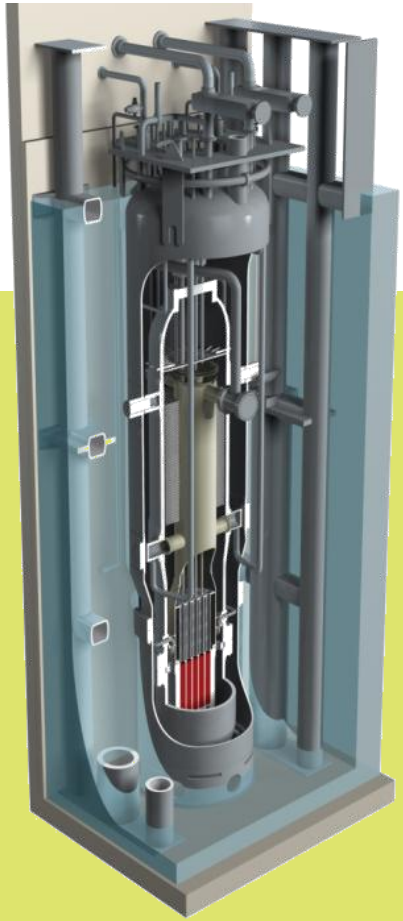


Idaho's Role in NuScale Small Modular Reactor Deployment

Testimony to Idaho LINE Commission

Boise, Idaho

Mike McGough, Chief Commercial Officer

January 21, 2014

NuScale Power™

Agenda

- NuScale Background
- What is a NuScale Small Modular Reactor?
- How does it work? How do we know it will work?
- What makes it unique?
- The Safety Case
- The DOE FOA process and results-Why NuScale won
- The role of INL in the NuScale design
- Project WIN—The Future of NuScale in Idaho
- What is Needed to Ensure Success in Idaho

NuScale Power History

- NuScale first of current US SMRs to begin design of commercial NPP.
- NuScale technology in development and design since 2000 (DOE) MASLWR program, with INL, lessons from AP600/1000 ¼-scale testing
- Electrically-heated 1/3-scale Integral test facility first operational in 2003
- Began NRC design certification (DC) pre-application project in April 2008
- Acquired by Fluor in 2011
- Indefinite cooling in SBO with no operator action, no additional water and no AC nor DC power-November 2012
- ~240 FTE's currently on project, ~$170MM spent project life-to-date
- 108 patents pending/granted, 17 countries

NuScale Engineering Offices Corvallis, Oregon

One-third scale Test Facility

NuScale Control Room Simulator

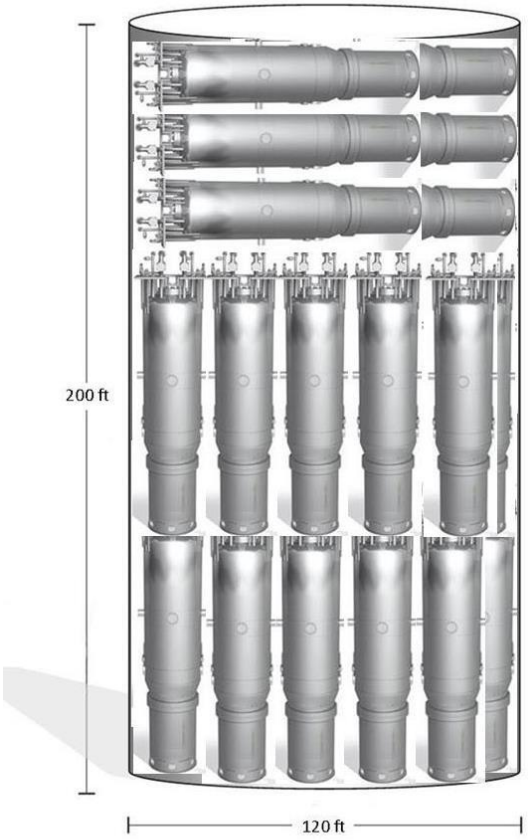
What is a NuScale SMR?

- A 45 Mwe Fully-integrated Nuclear Power Plant called a NuScale Power Module (NPM)
- Each NPM is factory built including containment and reactor vessel
- Each NPM has it's own package turbine
- Each NPM is installed underground in 10 MM gallon pool, along with up to 11 additional NPM's (for 540MWe total output)
- NPM's can be added incrementally as load grows

Size Comparison

Comparison size envelope of new nuclear plants currently under construction in the United States

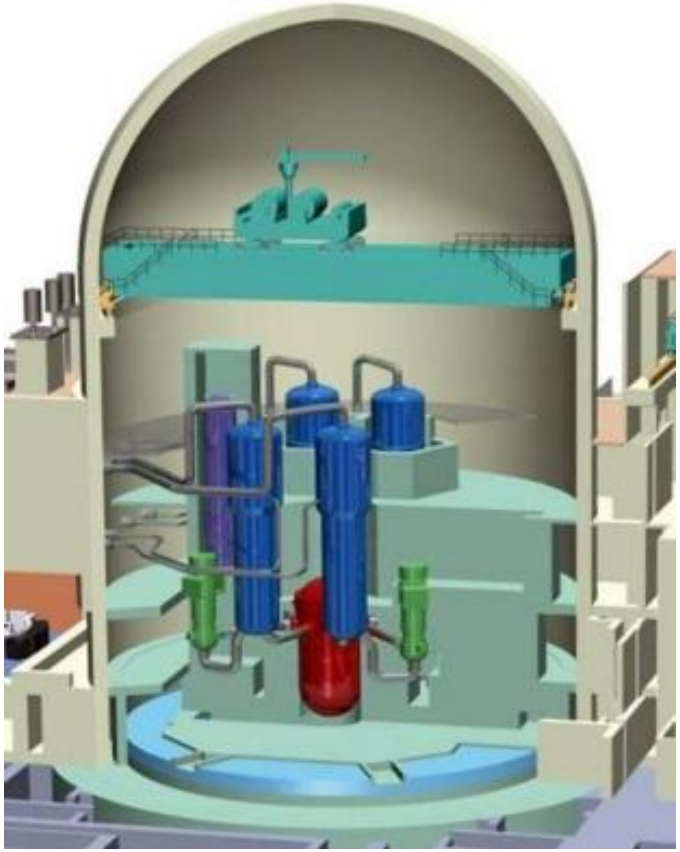
126 NuScale Power Modules



Containment

NuScale's combined containment vessel and reactor system

Typical Pressurized Water Reactor



*Source: NRC

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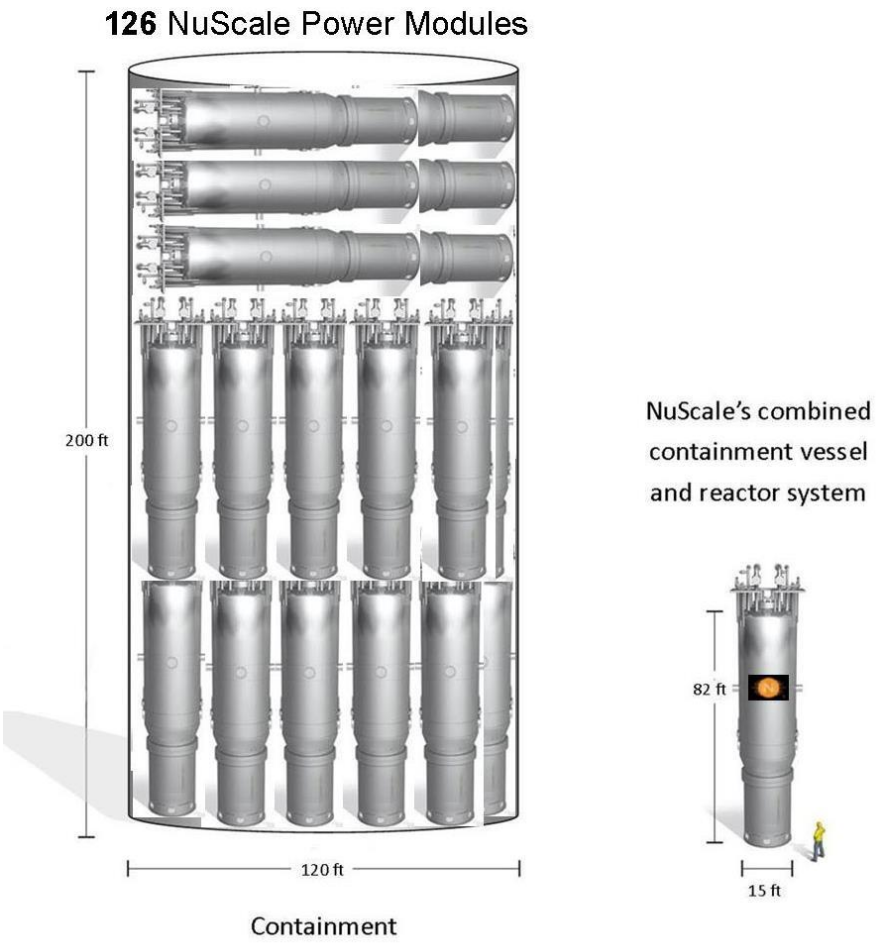
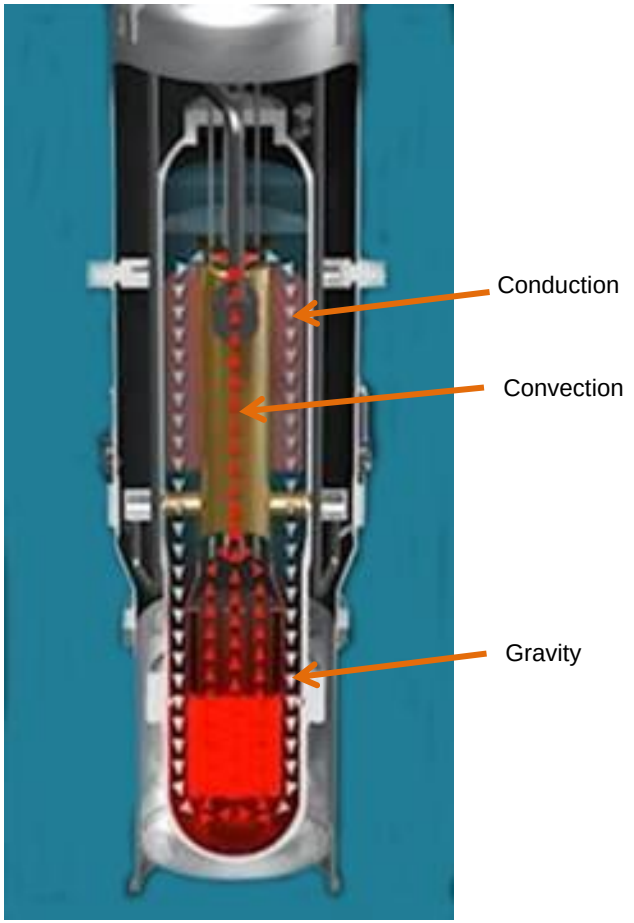
Coolant Flow Driven By Physics

Comparison size envelope of new nuclear plants currently under construction in the United States



NuScale Power Module relies on physics



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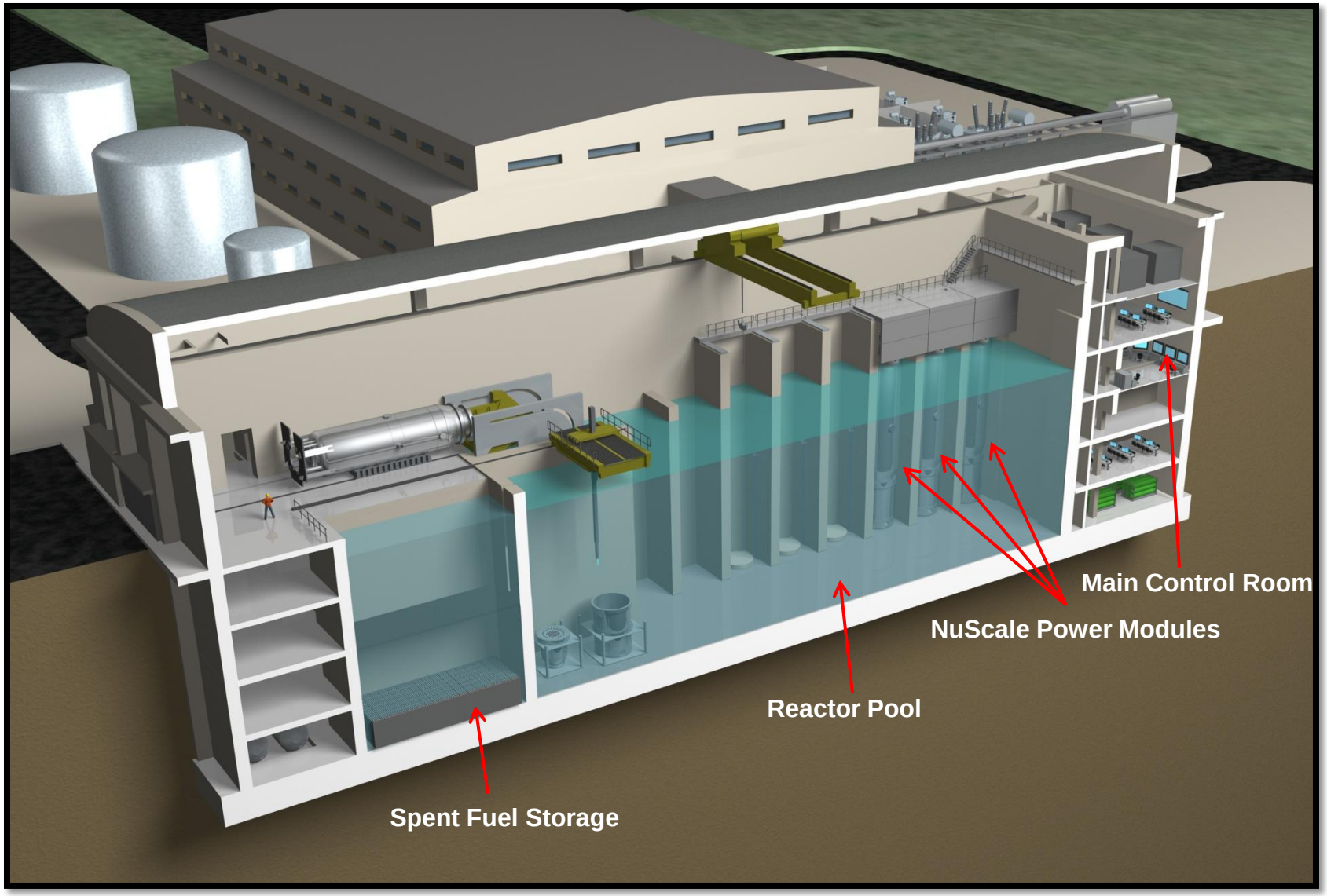
Reactor Building



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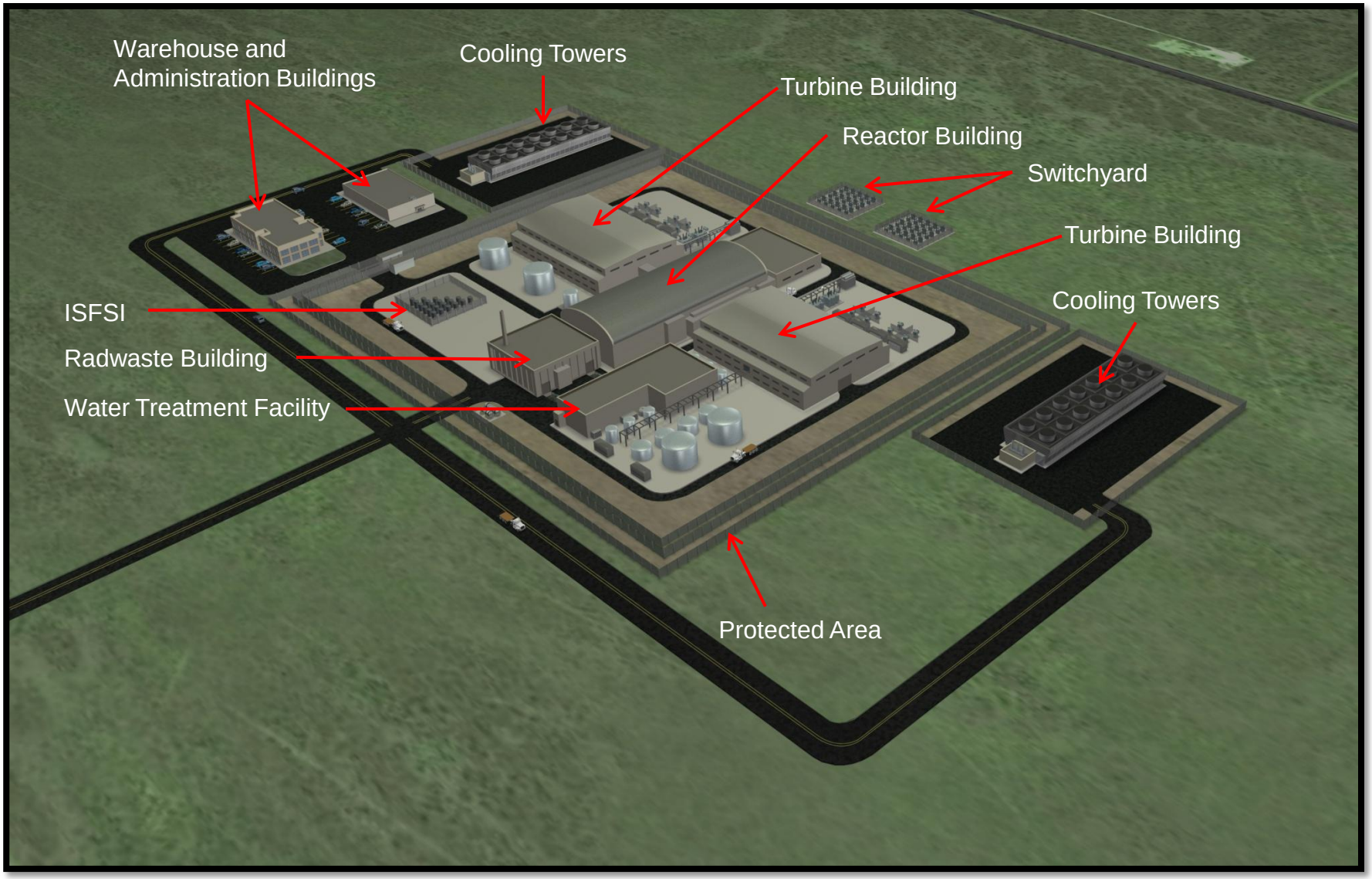
Site Layout



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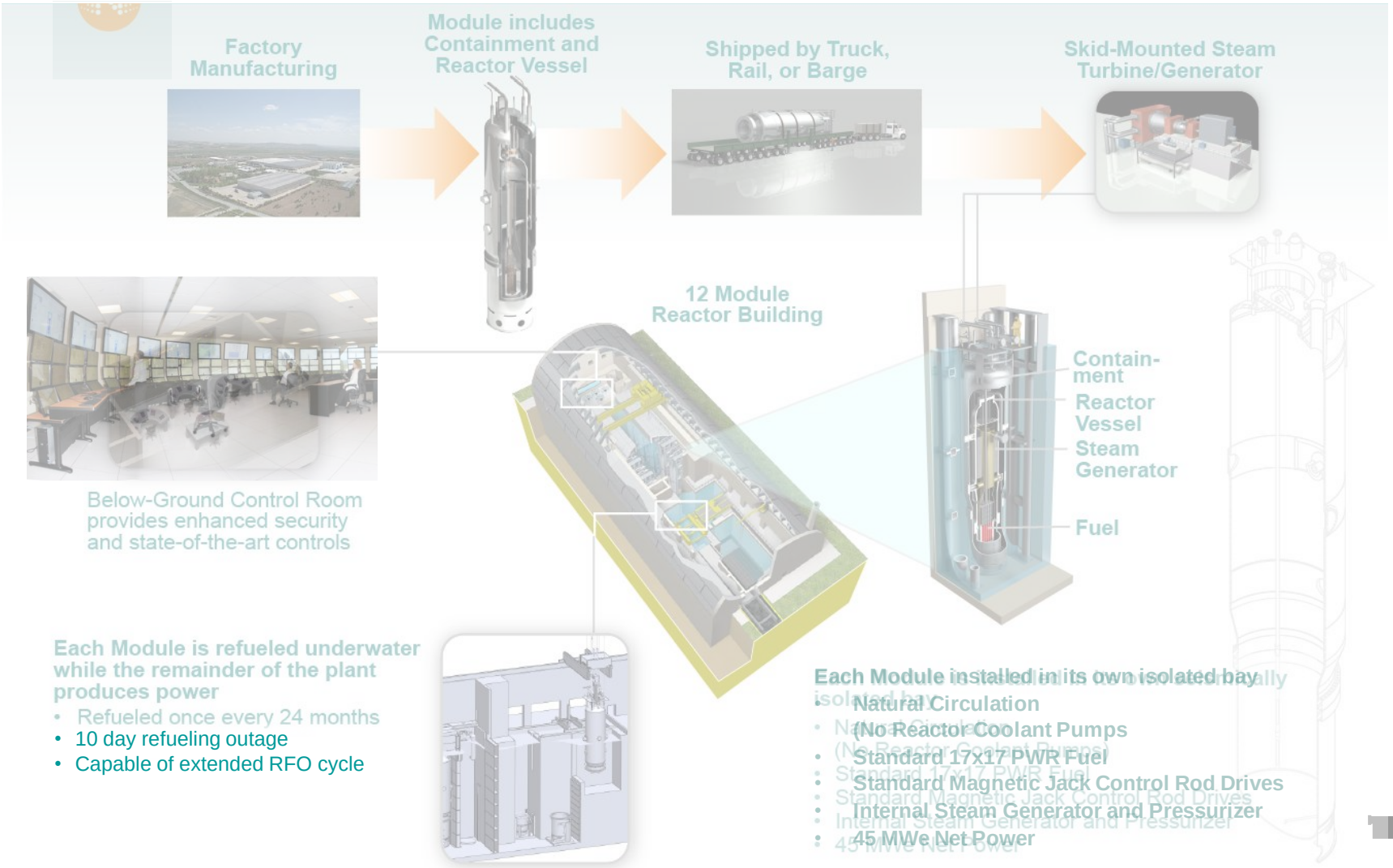
How Does it All Come Together?



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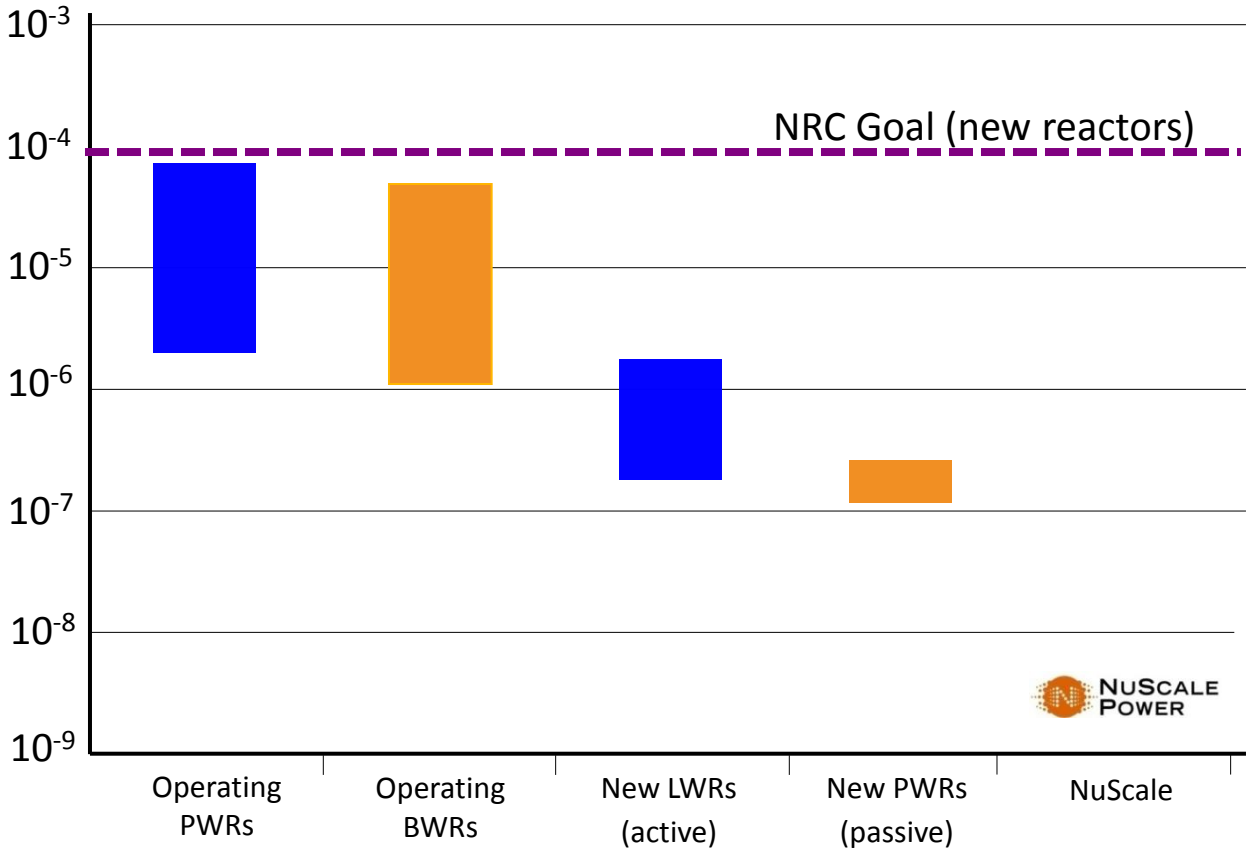
The Safety Case

Core Damage Frequency Significantly Reduced



Source: NRC White Paper, D. Dube; basis for discussion at 2/18/09 public meeting on implementation of risk matrices for new nuclear reactors

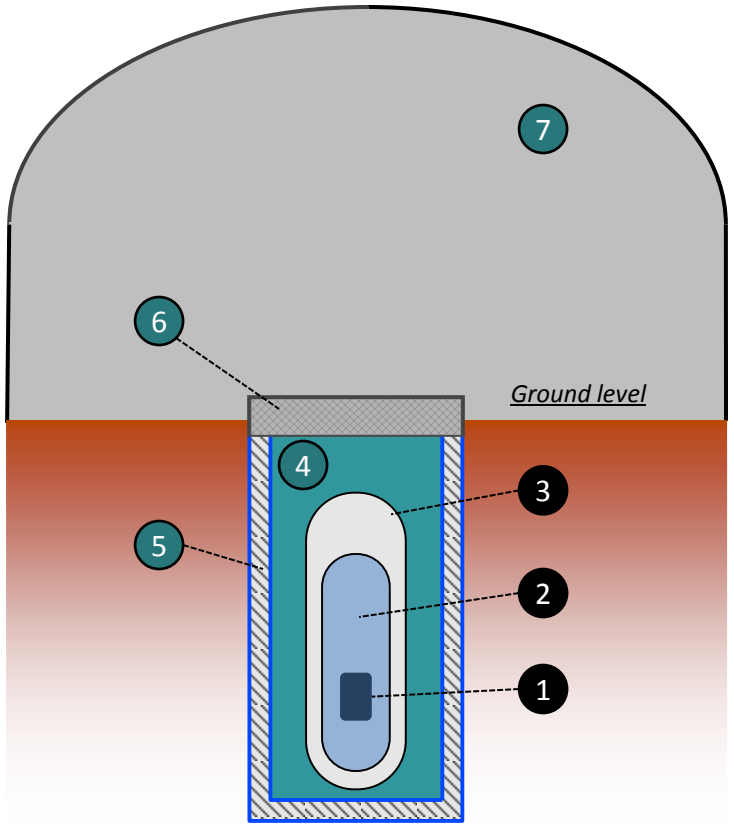
Added Barriers Between Fuel and Environment

Conventional Designs

1. Fuel Pellet and Cladding
2. Reactor Vessel
3. Containment

NuScale's Additional Barriers

4. Water in Reactor Pool
5. Stainless Steel Lined Concrete Reactor Pool
6. Biological Shield Covers Each Reactor
7. Reactor Building



NuScale Announces Major Breakthrough in Safety

Wall Street Journal - April 16, 2013

- NuScale design has achieved the “Triple Crown” for nuclear plant safety. The plant can safely shut-down and self-cool, indefinitely, with:
  - **No Operator Action**
  - **No AC or DC Power**
  - **No Additional Water**
- **VIDEO**
- Safety valves align in their safest configuration on loss of all plant power.
- Details of the Alternate System Fail-safe concept were presented to the NRC in December 2012.

How Do We Know It Works?

NuScale Integral System Test (NIST) Facility

Containment Vessel and Pool

- 1/3 Scale Test Facility In operation since 2003
  - Models RPV, Containment and Pool
  - Prototypic Fluid Conditions
  - NQA-1 Program review and Site Visit by NRC 8/12
- Test Facility Scaling Methodology sent to NRC - 12/10
- IAEA international standard problem test 5/11
- NRC Certification Testing Program in progress.
  - Data Being used for Safety Analysis Code Validation

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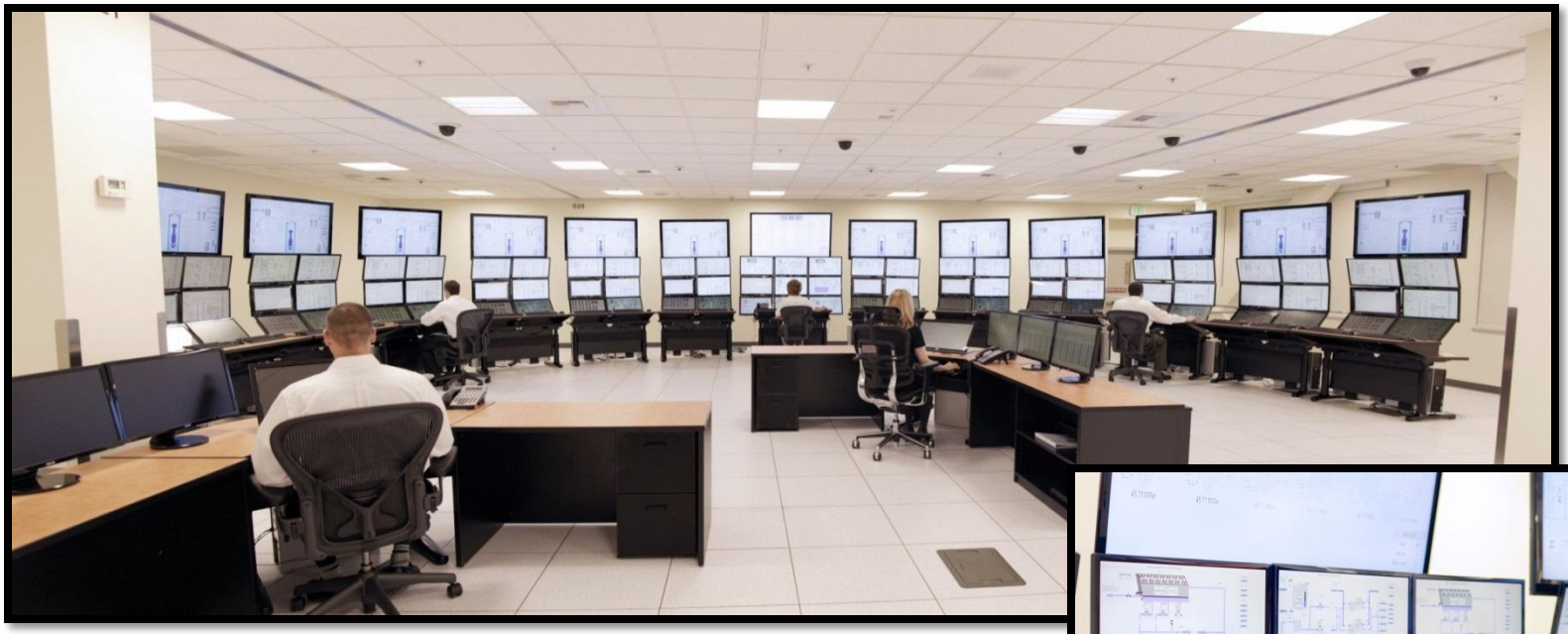
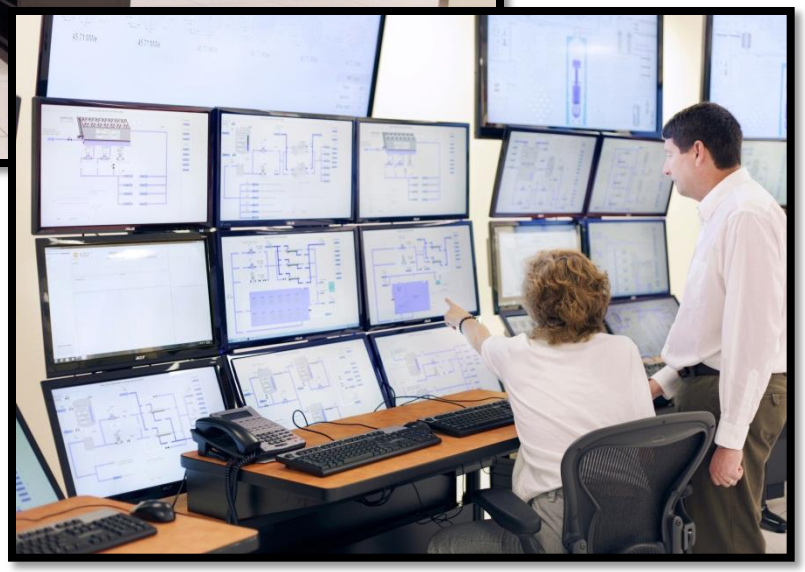
Full-Scale Main Control Room Simulator for HFE/HMI Studies

NRC Review of HFE Program and Site Visit 1/13



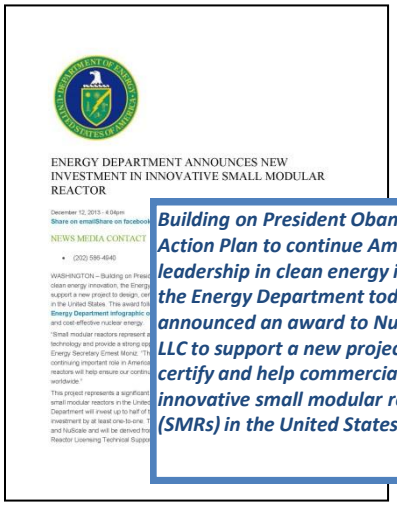


NuScale and INL

- Initial MASLWR program 2000-2003
- Human Factors Engineering
- Hybrid Energy Studies
- RELAP code development
- Prospective Site for Initial Project WIN
- Described Project WIN in NuScale FOA Proposal
- Site Assessment work Starting 1Q14

12/12/13 – NuScale Selected as DOE FOA Awardee

Energy Department Announces New Investment in Innovative Small Modular Reactor – U.S. Department of Energy



ENERGY DEPARTMENT ANNOUNCES NEW INVESTMENT IN INNOVATIVE SMALL MODULAR REACTOR

Building on President Obama's Climate Action Plan to continue America's leadership in clean energy innovation, the Energy Department today announced an award to NuScale Power LLC to support a new project to design, certify and help commercialize innovative small modular reactors (SMRs) in the United States.

Energy Department to Give $226 Million to Support Nuclear Reactor Design – The New York Times

The New York Times

December 12, 2013

Energy Department to Give $226 Million to Support Nuclear Reactor Design

The company, NuScale Power, has made substantial progress in developing "an invented-in-America, made-in-America product that will export U.S. safety standards around the world," Peter B. Lyons, the assistant secretary for nuclear energy, said in an interview. For supplying electricity without global warming gases and for providing the United States with a new export product, the reactor had "immense global and national importance," he said.

The New Age of Nuclear – Portland Business Journal

Business Journal

Thursday, December 26, 2013

The new age of nuclear

By Andy Giegerich

Sustainable Business Oregon editor

"It's Oregon-based ingenuity at the forefront of energy innovation," said Margi Hoffmann, Gov. John Kitzhaber's top energy adviser. "NuScale's carbon-free technology can play an important role in generating safe, clean and affordable energy."

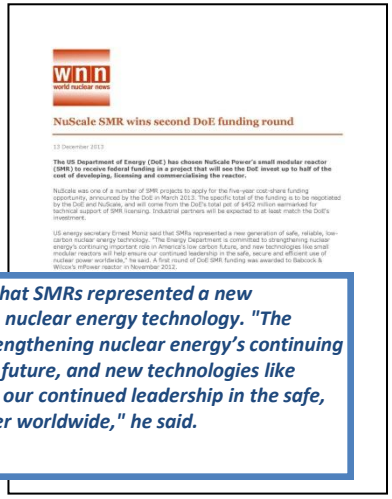
DOE Makes New Investment in Small Modular Nuclear Reactors – Electric Light & Power

Electric Light & Power

DOE makes new investment in small modular nuclear reactors

"The Nuclear Energy Institute congratulates NuScale Power, as well as its project partners Fluor Corporation, Energy Northwest and Rolls Royce, for advancing a small reactor design that has achieved an important milestone. The Department of Energy's newest investment in the development of small reactor designs boosts the potential for accelerated commercialization of an advanced clean energy technology that can have a tremendously positive impact domestically and internationally," said Richard Myers, the Nuclear Energy Institute's vice president for policy development, planning and supplier programs.

NuScale SMR Wins Second DOE Funding Round – World Nuclear News



wnn world nuclear news

NuScale SMR wins second DoE funding round

US energy secretary Ernest Moniz said that SMRs represented a new generation of safe, reliable, low-carbon nuclear energy technology. "The Energy Department is committed to strengthening nuclear energy's continuing important role in America's low carbon future, and new technologies like small modular reactors will help ensure our continued leadership in the safe, secure and efficient use of nuclear power worldwide," he said.

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DOE FOA Program, $452MM

- FOA1 Awarded $150MM to B&W November 2012
- FOA2 Issued – March 11, 2013
  - Proposals Submitted – July 1, 2013
  - Target date for awards – Sept. 17, 2013
  - NuScale selection announced Dec. 12, 2013
- Funding – up to $226M, single award
- To be used for Design and Design Certification Projects
- Revised FOA2 Criteria, Innovation, Fukushima Resistance, Licensability timeline

NuScale Differentiators

NuScale Power Module

- If power is lost:
  - Indefinite cooling w/o operator action, w/o water addition, w/o power
- NPM integrates RPV and CV in one factory-built component
- One-third scale prototype operational since 2003
- Extensive testing program, 108 patents (as of 12/13)
- Full-scale control room simulator since 5/2012
- NRC pre-app engagement since April 2008
- NPM shippable by common modes of conveyance
- Underground, immersed in UHS common pool
- 45 MW incrementally scaleable modules
- Reactor Coolant Pumps: NONE
  - coolant circulates by natural physics: convection, conduction, and gravity

The Genesis of Project WIN

- **June 2010:** Idaho Governor Butch Otter became Chair of Western Governors Association (WGA) and sponsored Western nuclear energy policy
- **June 2011:** "The Future of Nuclear Energy: Shaping a Western Policy" published: discusses SMR's explicitly
- **Feb 2012:** Otter creates Idaho Leadership in Nuclear Energy (LINE) Commission
- **June 2012:** Utah Governor Gary Herbert becomes WGA Chair and sponsors development of a 10-year energy plan-patterned after Utah 10-year plan
- **June 2013:** WGA 10-yr plan unveiled with stated goal to "Find ways to accelerate the introduction of SMRs into the marketplace."

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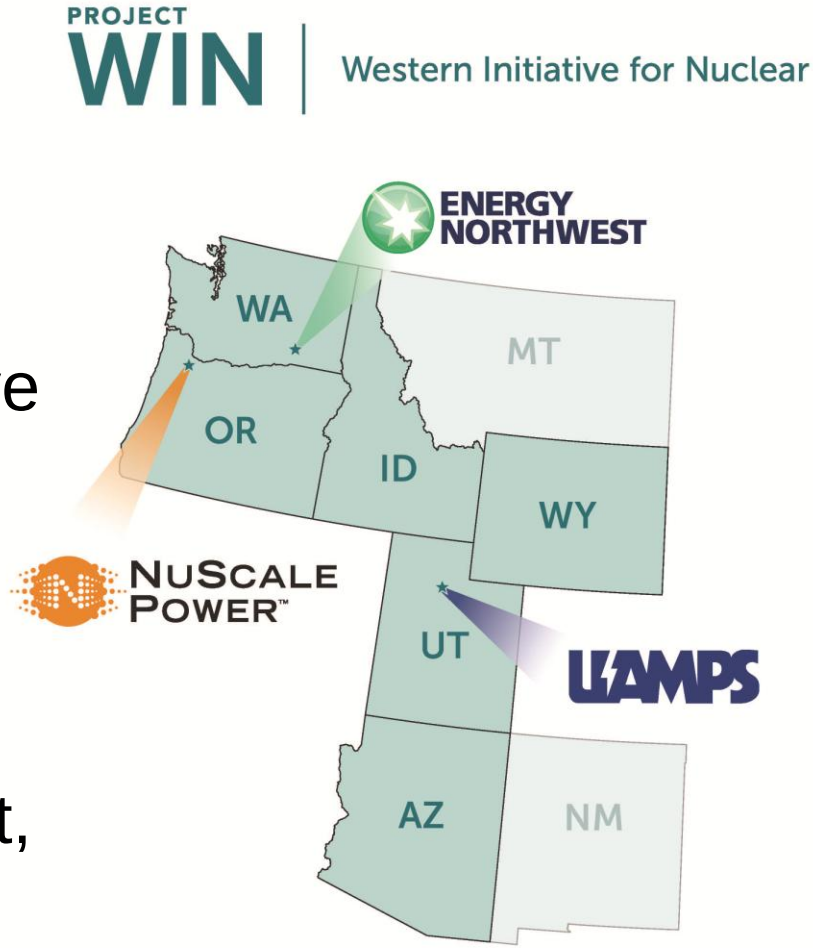
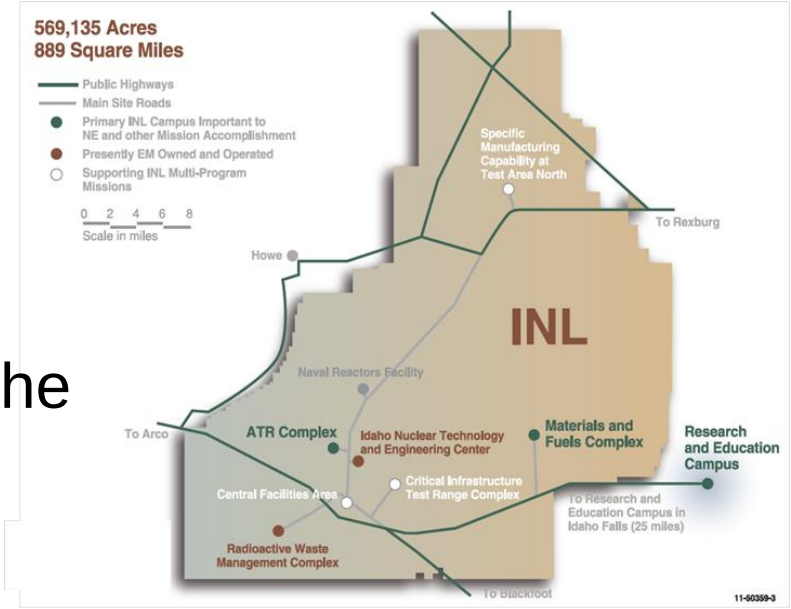
What is Project WIN?

- Western Initiative for Nuclear (WIN) is a multi-western state collaboration to investigate the demonstration and deployment of an innovative SMR design developed by NuScale Power.
- Involved Project WIN participants: NuScale, UAMPS, Energy Northwest, ID, UT, OR, WA, WY, AZ, NM?, MT?



Project WIN Details

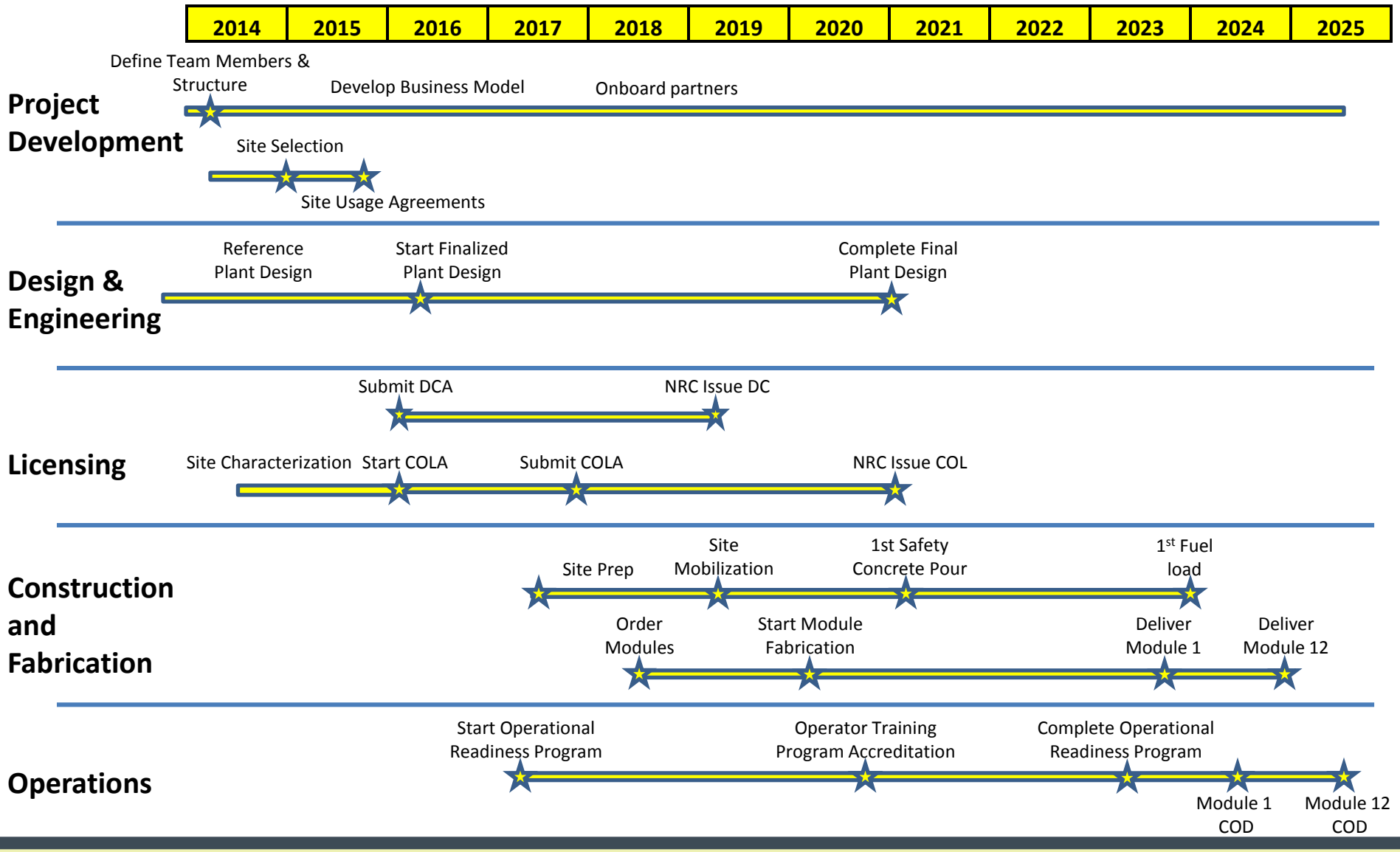
- First commercial demonstration project: a multi-module NuScale plant with a preferred location within the Idaho National Laboratory (INL) Site.



- Expected to become operational in the 2023-2024 time frame.

- A 6-12 module plant (270-540 MWe) is anticipated based on a preliminary evaluation of potential generating capacity needs.

Overall WIN Project Schedule



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What Will Project WIN mean to Idaho?

- Establishes INL as key player in SMR deployment
- Creates slipstream for other NuScale projects, both within WIN family and elsewhere worldwide
- Project will create ~1000 construction jobs at peak, for duration of 2-3 years
- Indirect economic benefits and associated job multipliers
- Full-time plant employment ~360 at average salaries $85K
- Indirect economic benefits
- Establishes Idaho as potential desired location for NuScale supply chain members

What is Needed to Ensure Success in Idaho?

- Need a committed owner/buyer – will ultimately drive site selection decision for first project
- Project will need to demonstrate sufficient need for/use of generated power
- State should consider doing economic impact study – (Geoff Black?)
- Suitable plant economics/investment profile (e.g. long-term PPA's)
- Favorable/supportive local and state permitting and approval processes
- Economic development incentives (ala Eagle Rock?)
- Sufficient capable facility workforce and community interest

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Mike McGough
Chief Commercial Officer
mmcgough@nuscalepower.com