U.S. DEPARTMENT OF ENERGY | Idaho Operations Office

Overview of the Idaho Operations Office

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Manager

U.S. Department of Energy

Idaho Operations Office

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Mission and Vision

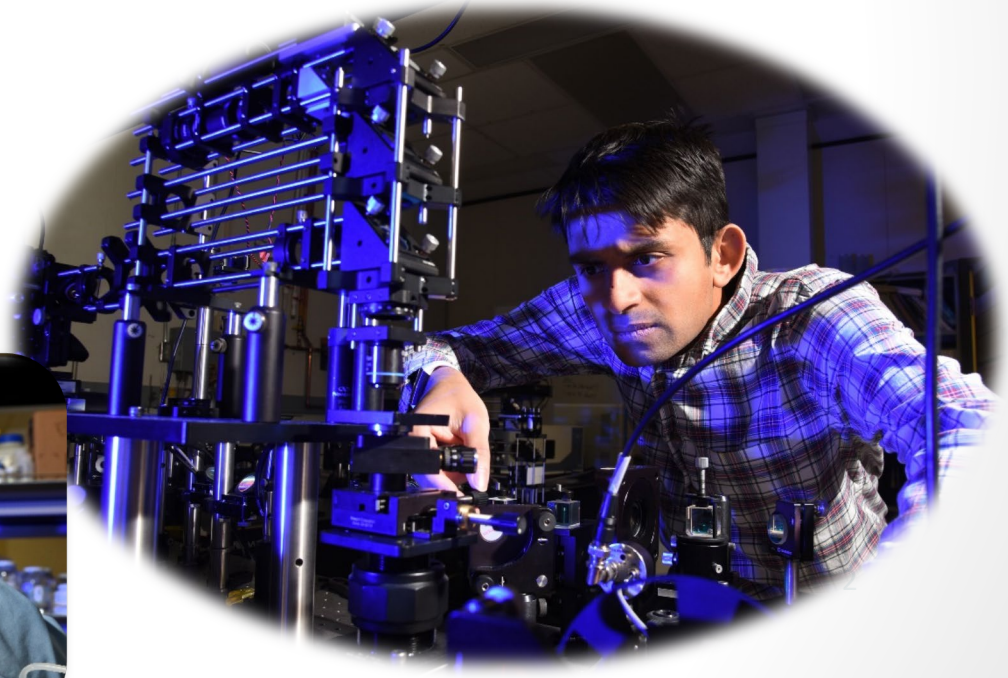
Mission

Provide excellence in federal stewardship to advance sustainable energy solutions, ensure secure and resilient critical infrastructure, equip the defenders of our nation, protect Idaho natural resources, and fulfill our environmental commitments

Vision

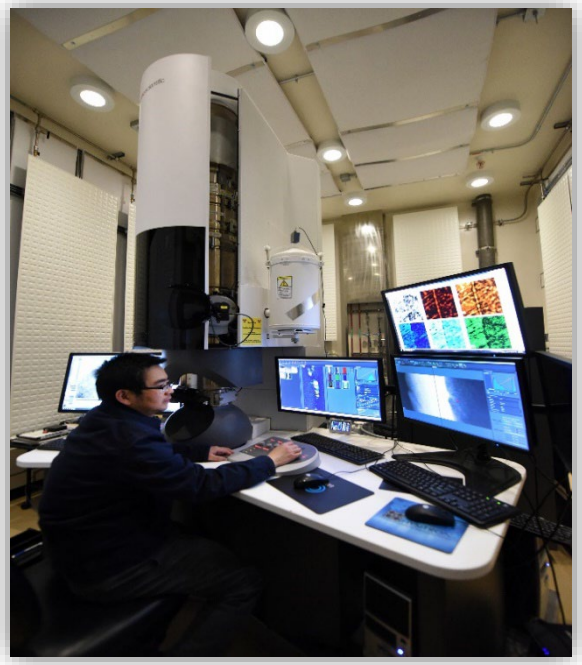
Sustainable, Clean, and Secure Energy

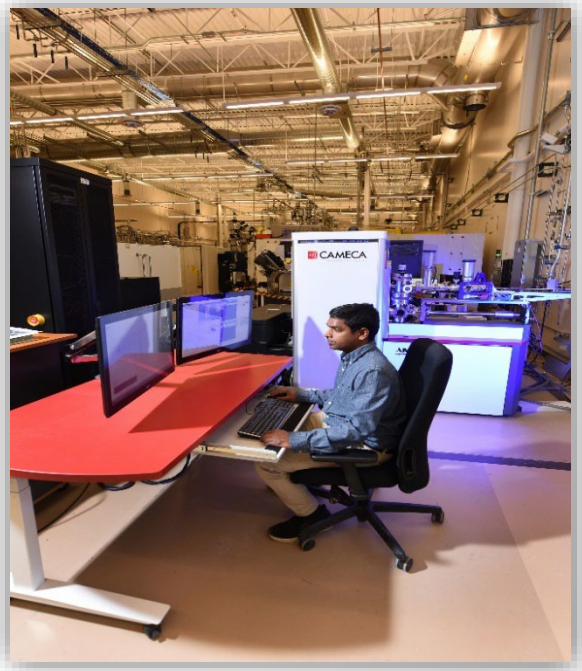
for the 21st Century



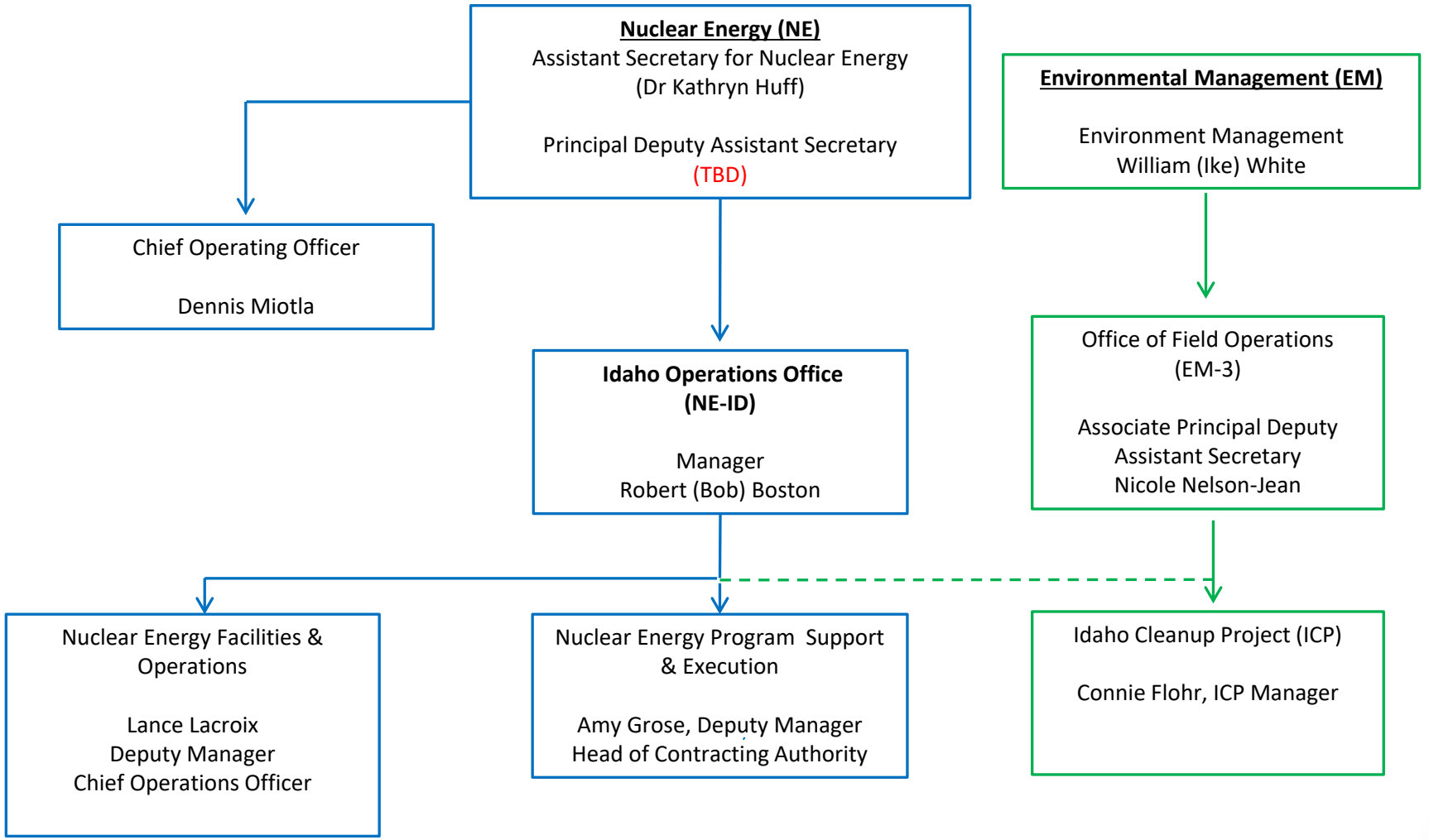
Idaho Operations Office
Organizational Responsibilities

- Procurement Management
- Operational Oversight / Contractor Assurance
- Security of Nuclear Material and Information Security Systems
- Site Stewardship
- Project Management





Organization Chart



Idaho National Laboratory (INL)
Infrastructure portfolio - By the numbers

298 DOE owned buildings & trailers

27 Contractor leased buildings and Trailers

25 Nuclear Facilities
Haz Cat I Adv. Test Reactor
Haz Cat II
Haz Cat III

44 Radiological Facilities

4 Operating Reactors

5,224 BEA Staff & Subcontractors
FY20 Business Volume $1.49B

3.2B $ RPV

3.3M SQ FT Gross

3 Fire Stations
1 Landfill
1 Museum

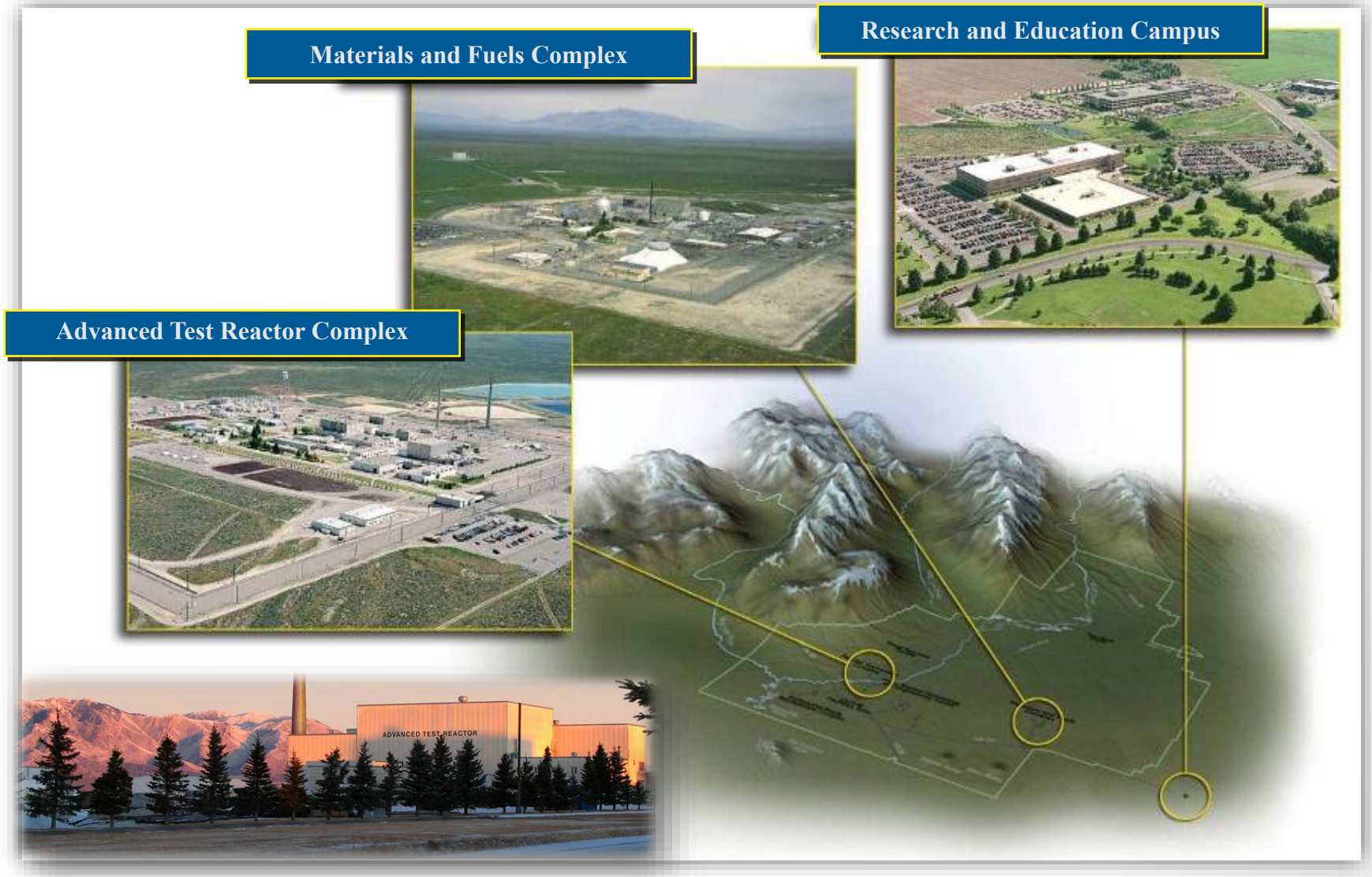
40 Miles primary roads / 125 total

17.5 Miles railroad for shipping nuclear fuel

7 Substations with interfaces to 3 power providers

112 Miles high-voltage transmission lines

Most of INL's Nuclear Energy R&D capabilities are focused on three primary site areas



M&O Contractor Performance

- DOE manages the Battelle Energy Alliance, LLC (BEA) contract, BEA runs the Lab
- DOE tailors its oversight based on the BEA's use of and results from internal systems and oversight (Contractor Assurance)
- DOE defines performance expectations annually in a Performance Evaluation and Measurement Plan (PEMP)
  - strategic objectives
  - BEA determines the best way to achieve the objectives

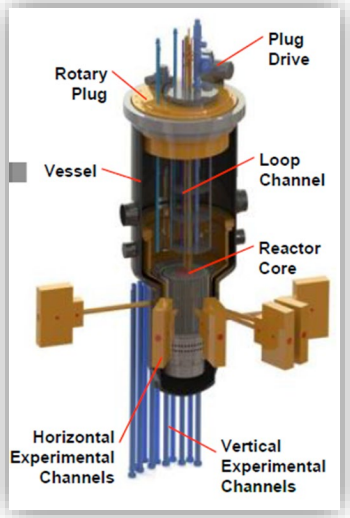
FY22 Appropriations Summary

DOE Office of Nuclear Energy Funding Nationwide: FY22 $1655 M (up 10%)

INL Infrastructure Programs

$579M FY22 Funding

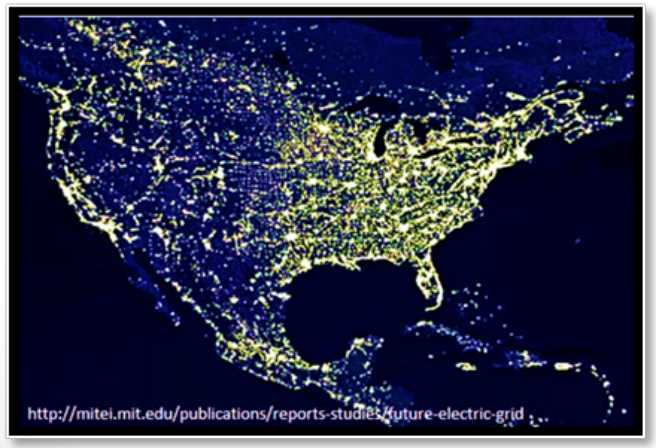
- INL Facilities: $387.7M
- Sample Prep Lab: $41.9M
- INL Safeguards & Security: $149.8M



Fuel Cycle Programs

$320M FY22 Funding

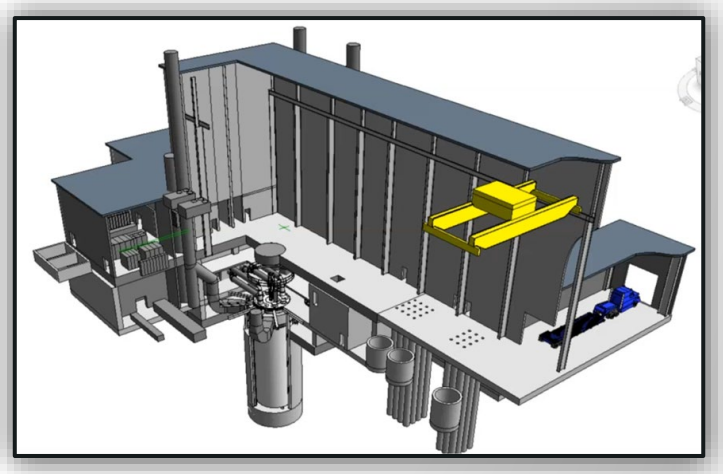
- Advanced Nuclear Fuel Availability: $45M
- Advanced Fuels: $152M
- Fuel Cycle Other: $123M



Reactor Fleet & Deployment

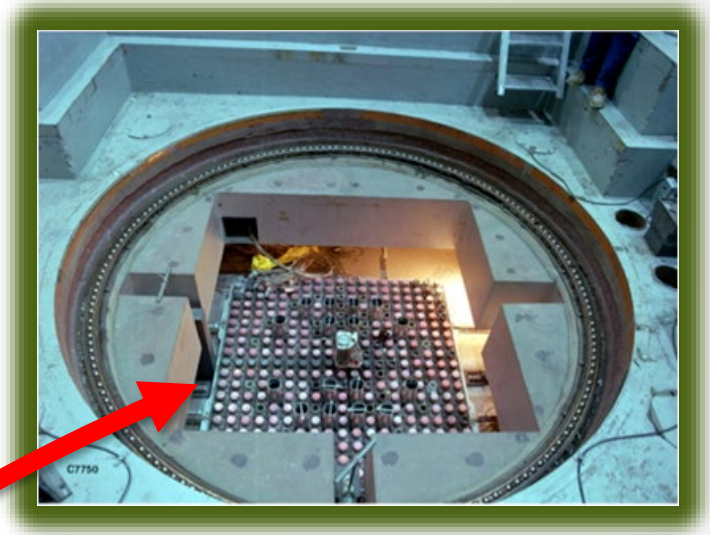
$611M FY22 Funding

- Advanced Reactors Demonstration: $250M
  - *National Reactor Innovation Center* *$55M*
  - *Demonstration 1* *$30M*
  - *Demonstration 2* *$30M*
  - *Risk Reduction for Future Demonstrations* *$115M*
  - *Regulatory Development* *$15M*
  - *Advanced Reactors Safeguards* *$5M*
- Nuclear Energy Enabling Technologies: $117M
- Advanced SMRs: $150M
- Advanced Reactor Technologies: $46M
- LWR Sustainability: $48M



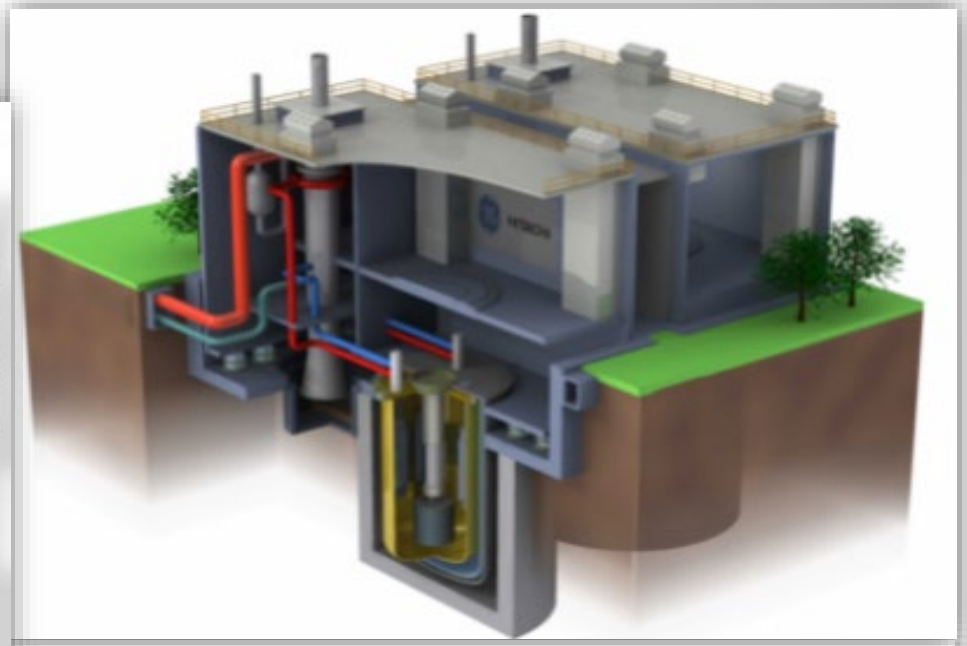
Transient Reactor Test Facility (TREAT) Reactor

- Designed to conduct transient testing of fuels and structural materials
- Operated from 1959 to 1994 (construction completed in November 1958)
- Approved DSA in 2016
- Approved startup and operations in 2018



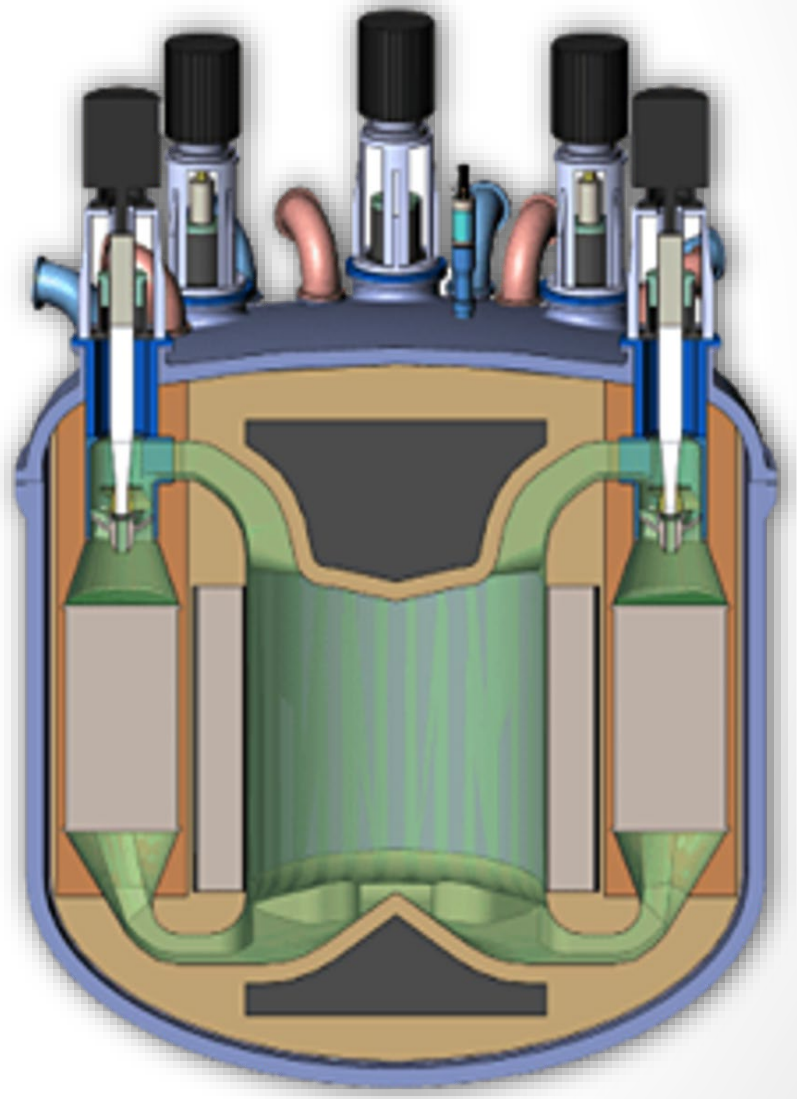
New Reactor Projects

- Versatile Test Reactor
  - EIS Record of Decision
  - Safety Basis Approval Authority
  - Federal Project Director(s)
- MARVEL
  - EA ROD
  - Safety Basis Approval Authority
  - R&D activity
- Pele



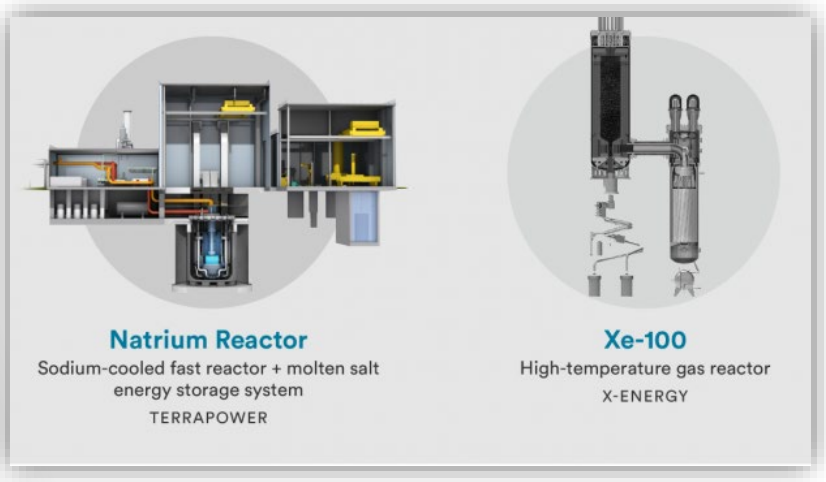
New Reactor Projects

- TerraPower Molten Chloride Reactor Experiment (MCRE)
  - Due to the scale of the reactor, construction inside an existing nuclear facility, a short operating cycle, and an existing path for disposition, an environmental assessment (EA) is recommended to determine if significant impacts are present.
  - This EA is expected to be completed in 2022.
  - In December 2021, INL completed a major accomplishment of successfully performing fuel synthesis in a newly commissioned glovebox. This work is necessary to enable effective design of the Fuel Salt Synthesis Line which will produce the fuel for MCRE.

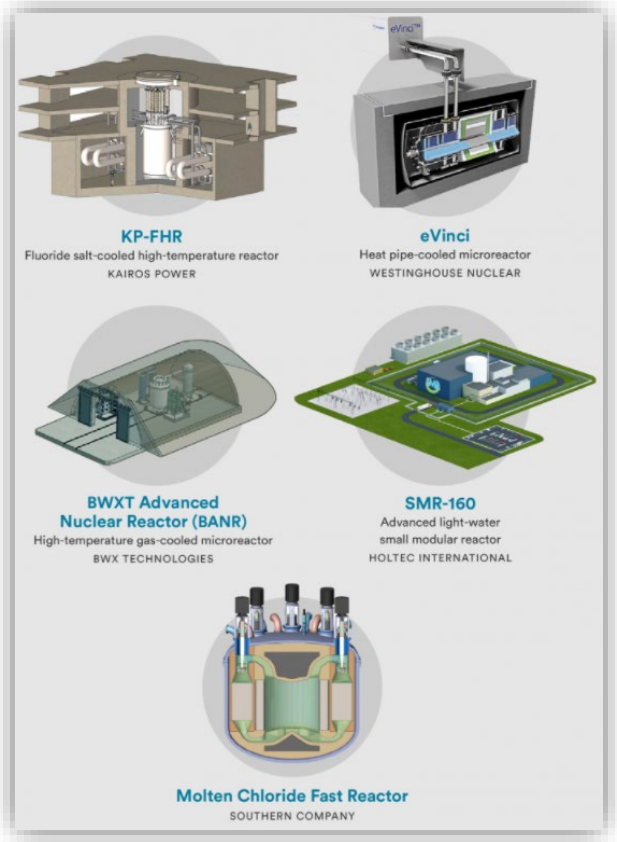


New Reactor Projects (continued)

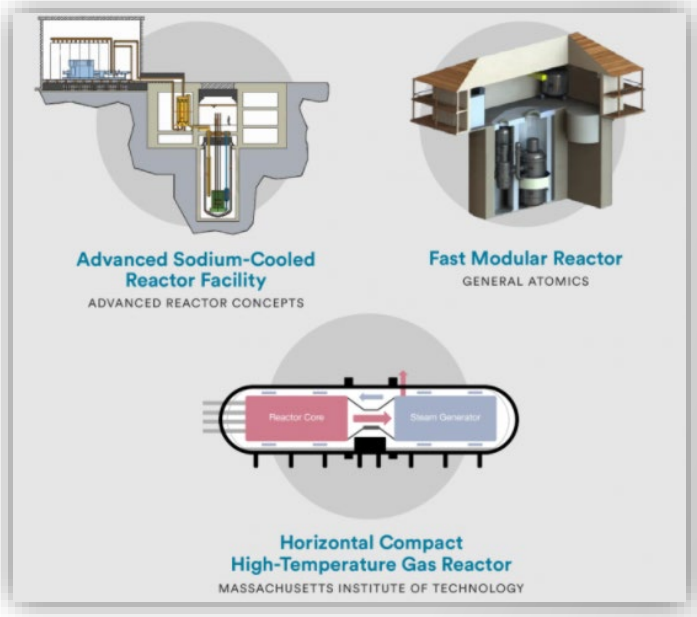
Demonstration Goal: Test, License and build Operation reactors within 5-7 years



Risk Reduction Goal: Solve technical, operation and regulatory challenges to support demonstration within 10-14 years.

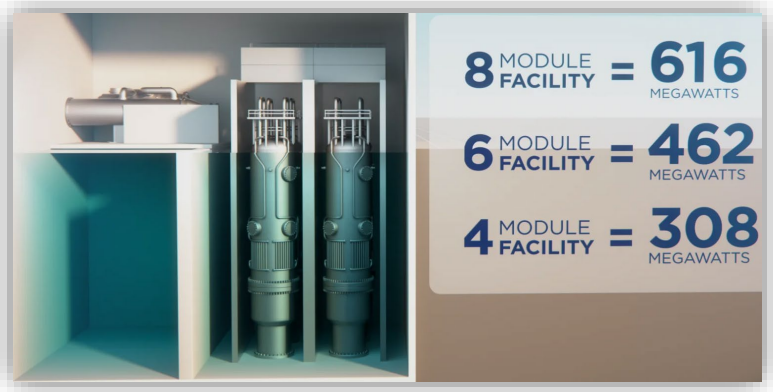


Concept Development Goal: Solidify concept to mature technology for potential demonstration by mid 2030s.

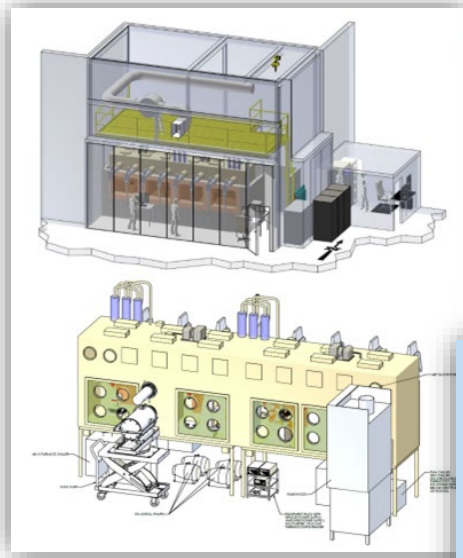


New Reactor Projects and other activities (continued)

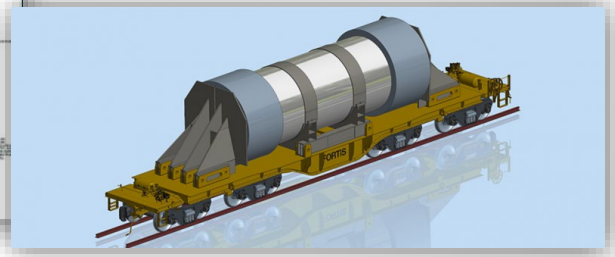
- Carbon Free Power Project (CFPP)
- Molten Salt Thermophysical Examination Capability (MSTEC)
- HALEU Accessibility Program
- Consent Based Siting
- FORTIS & ATLAS, DOE 8 & 12 axle Spent Nuclear Fuel Railcars
- Accident Tolerant Fuel development



CFPP

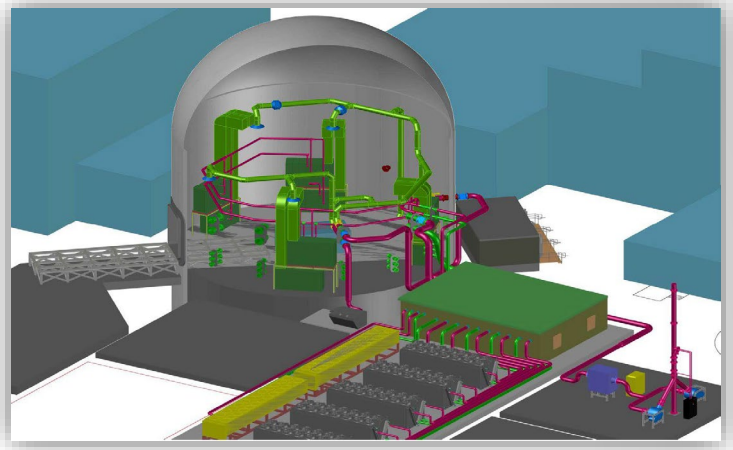


MSTEC



Infrastructure Projects

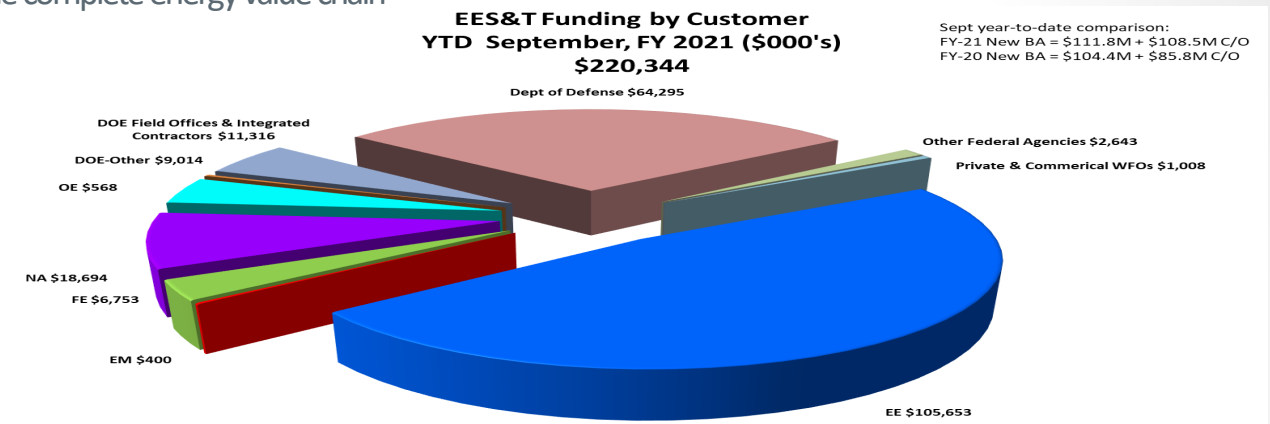
- Dome
- Safeguard Category 1 Test Bed
- Sample Preparation Laboratory
- Advanced Test Reactor Reactor Support Building
- Analytical Laboratory Ventilation Upgrade
- Materials and Fuels Complex Protective Forces Building
- 10 General Plant Projects (>$25M)



Renewable Energy Programs

Transform the complete energy value chain

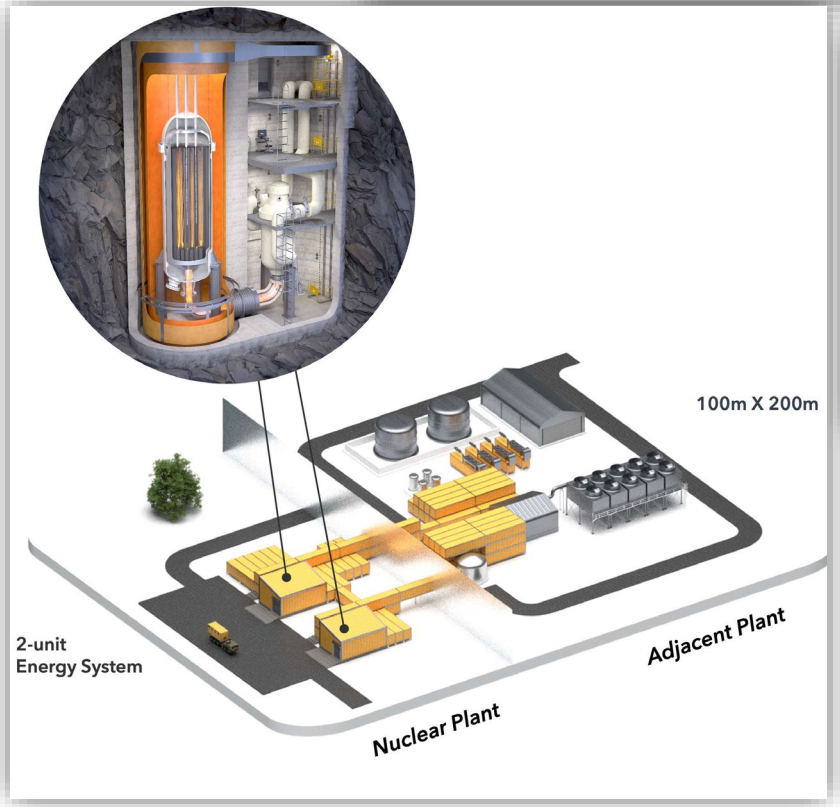
- **Advanced Transportation:**
  - Address new challenges brought on by automated, connected, electric and shared mobility through data analysis, modeling and optimization to envision a future where transportation is securely integrated with infrastructure and the grid
- **Bioenergy Technologies:**
  - Develop bioenergy feedstock supply systems to efficiently and sustainably deliver large quantities of on spec feedstocks to various types of bioenergy conversion systems.
- **Energy Storage:**
  - Understand the link between energy storage applications, systems design and materials/interfacial interactions. This includes evaluating batteries for vehicle, grid and other applications, as well as understanding the role of battery design and how different chemistries and technologies impact the full system performance.
- **Resilient Power Systems, Power and Energy Systems:**
  - Use physics-based models to develop a more complete power systems environment in order to characterize transient dynamics and integration complexities associated with grid integration.
  - Full spectrum, co-simulated power analysis to facilitate the integration and management of complex power systems, including distributed energy resources.
- **Subsurface Science:**
  - Study and research processes occurring under the earth's surface, including site evaluations for used fuel disposition; fossil and geothermal energy development; exploration and site characterization for remedial activities; groundwater quality, quantity and management; well drilling and design; and large-scale energy storage.
- **Thermal Energy Integration:**
  - Tighter integration of energy production with energy consumption to minimize heat lost and find ways to monetize rejected heat.



NRC Licensed Facilities

- Carbon Free Power Project
  - Site use permit issued
  - Small modular reactor concepts
- Oklo
  - Site use permit issued
- Ultra Safe Nuclear

CFPP



USNC

Oklo

National Security Programs

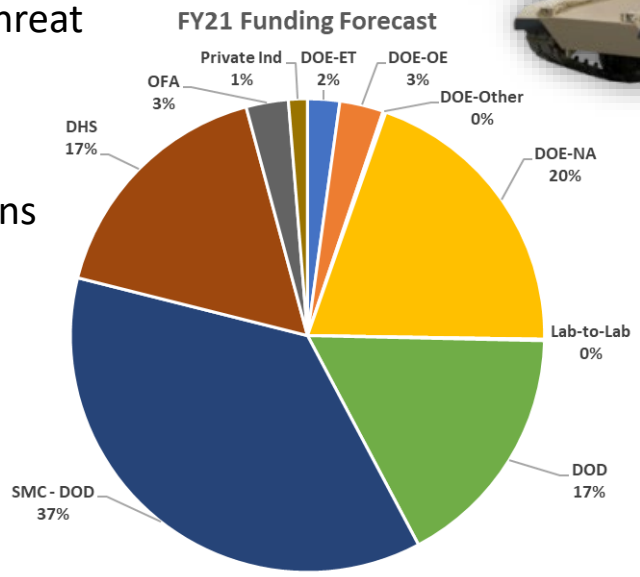
Impactful, Relevant, Urgent

- **Electric Grid Security & Resilience**
  - Control systems cyber security
  - Leading & integrating national effort
  - Strong utility & academic partnerships
  - Transforming the Nation's resilience through awareness, capability development, equipping & exercising
- **Nuclear Nonproliferation**
  - Understanding the nuclear threat
  - Minimizing & eliminating the threat
  - Responding to nuclear threats
- **National Defense**
  - Capabilities & technical solutions for national level needs
  - Equipping our warfighters
- **FY21 Funding - $503M**

Sustaining This

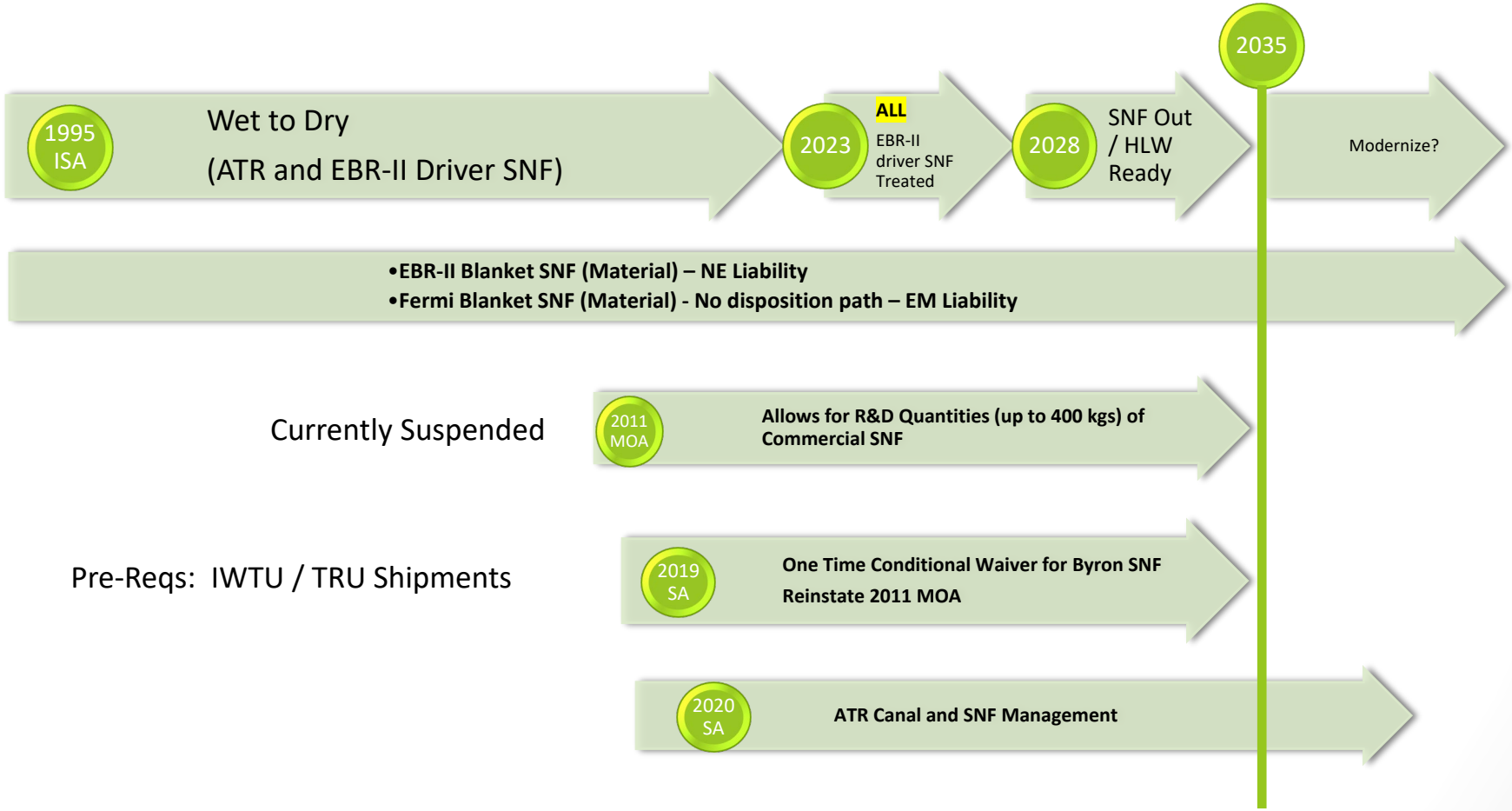
Preventing This

Armor Production



Idaho Settlement Agreement

"It's Complicated"




IDAHO OPERATIONS OFFICE
EXCELLENCE IN FEDERAL STEWARDSHIP

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