Reactor Technology Program Overview

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U.S. DEPARTMENT OF ENERGY

NE Mission Priorities

Existing Fleet

Advanced Reactor Pipeline

Fuel Cycle Infrastructure

Existing Fleet

- Competitively-award joint, cost-shared research projects through ***Light Water Reactor Sustainability*** program to solve significant highest priority cost and technical problems threatening existing plants

- Fund primary and secondary candidate ***Accident Tolerant Fuel*** designs to enhance the number of candidate fuels for commercial reactor irradiations and accelerate commercial irradiations by 2 years from the 2022 Congressional mandate

- Conduct ***cyber research*** to develop **intrusion-resistant systems and practices** in support of US nuclear plants

Advanced Reactor Pipeline

- Via the *Gateway for Accelerated Innovation in Nuclear (GAIN)* initiative, NE is providing U.S. nuclear technology developers access to the DOE National Laboratory complex:
  - ✓Technical staff across
  - ✓Advanced computational methods and machines
  - ✓Specialized R&D infrastructure
  - ✓Nuclear Technology R&D data from historic DOE demonstration programs
- Executing First of a Kind (FOAK) **Advanced Small Modular Reactor (SMR)** competitive private-public partnerships to ensure SMRs commence powering the grid by 2026-2028
- Executing competitively-awarded private-public **Advanced Reactor Technology** development projects for High Temperature Gas and Molten-Salt Reactors
- Supporting **Industry-identified R&D** originating from the NEI/GAIN Technology Working Groups: High Temperature Gas, Molten-Salt, and Fast Reactors

Industry-Focused Funding Opportunity Announcement

- Total FY 2018 funding available of about $110 Million
- Total of 39 proposals received during first-two Cycles (2018-1 and 2018-2) of Inaugural Year
- About $318 Million in DOE-funded work scope has been proposed
  - Tier 1 FOAK Nuclear Demonstration projects
    - 10 proposals; $215 million
  - Tier 2 Advanced Reactor Development projects
    - 23 proposals; $101 million
  - Tier 3 Regulatory Assistance grants
    - 6 proposals; $2 million
- 3rd Cycle (2018-3) application window closes July 31st

Nuclear Energy Research & Development

	FY 2017 Enacted	FY 2018 Omnibus	FY 2019 Request
SMR Licensing Technical Support	**95,000**	**-**	**0**
STEP R&D	**5,000**	**5,000**	**0**
Reactor Concepts RD&D			
Advanced SMR R&D	-	-	54,000
Light Water Reactor Sustainability	40,000	47,000	20,000
Advanced Reactor Technology	87,000	155,000	74,000
Versatile Advanced Test Reactor	5,000	35,000	15,000
Reactor Concepts RD&D	**132,000**	**237,000**	**163,000**
Fuel Cycle Research and Development			
Mtls Recovery and Waste Form Dvlpmnt	33,400	30,000	5,000
Advanced Fuels	68,000	125,000	40,000
Systems Analysis and Integration	12,000	8,641	0
MPACT (Mtls Prot'n, Accnt'g & Cntrl Techy)	5,400	10,000	5,000
UNFD R&D	62,500	63,915	10,000
Integrated Waste Management System	22,500	22,500	0
Fuel Resources	3,700	-	0
Fuel Cycle R&D	**207,500**	**260,056**	**60,000**
Nuclear Energy Enabling Technologies			
Modeling and Simulation Hub	24,300	30,000	0
Crosscutting Technology Development	27,000	50,000	47,400
NEAMS	28,300	28,200	34,000
Nuclear Science User Facilities	35,500	50,800	34,600
Nuclear Energy Enabling Technologies	**115,100**	**159,000**	**116,000**

Nuclear Energy FY 2018 R&D Budget Highlights

$155M for Advanced Reactor Development, including SMRs

$35M for Versatile Advanced Test Reactor R&D

$40M for Accident Tolerant Fuels

$50M for Crosscutting competitive R&D

$58M for Advanced Modeling & Simulation

Nuclear Energy FY 2019 R&D Budget Highlights

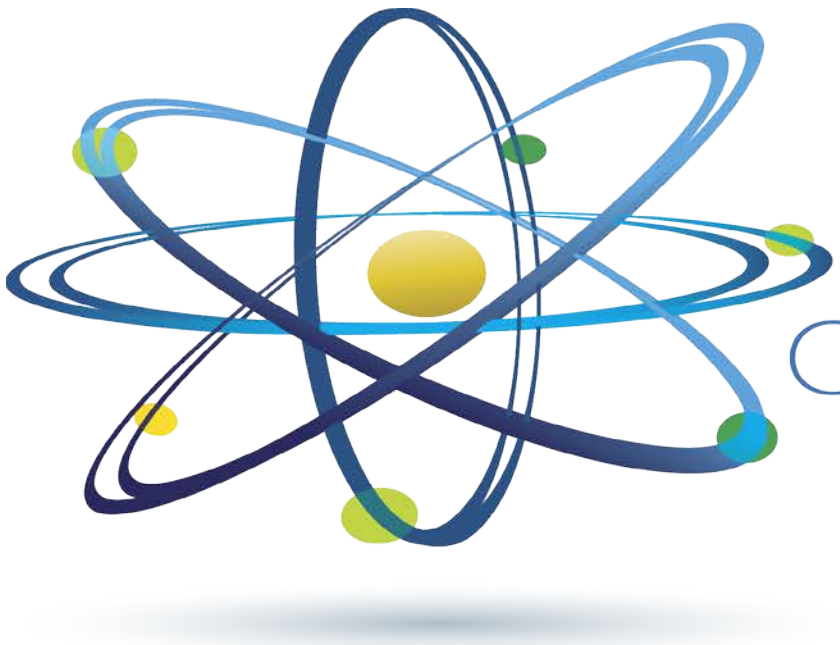
$54M for Advanced SMR R&D

$15M for Versatile Advanced Test Reactor R&D

$40M for Accident Tolerant Fuels

$47M for Crosscutting competitive R&D

$34M for Advanced Modeling & Simulation



Clean. **Reliable. Nuclear.**