

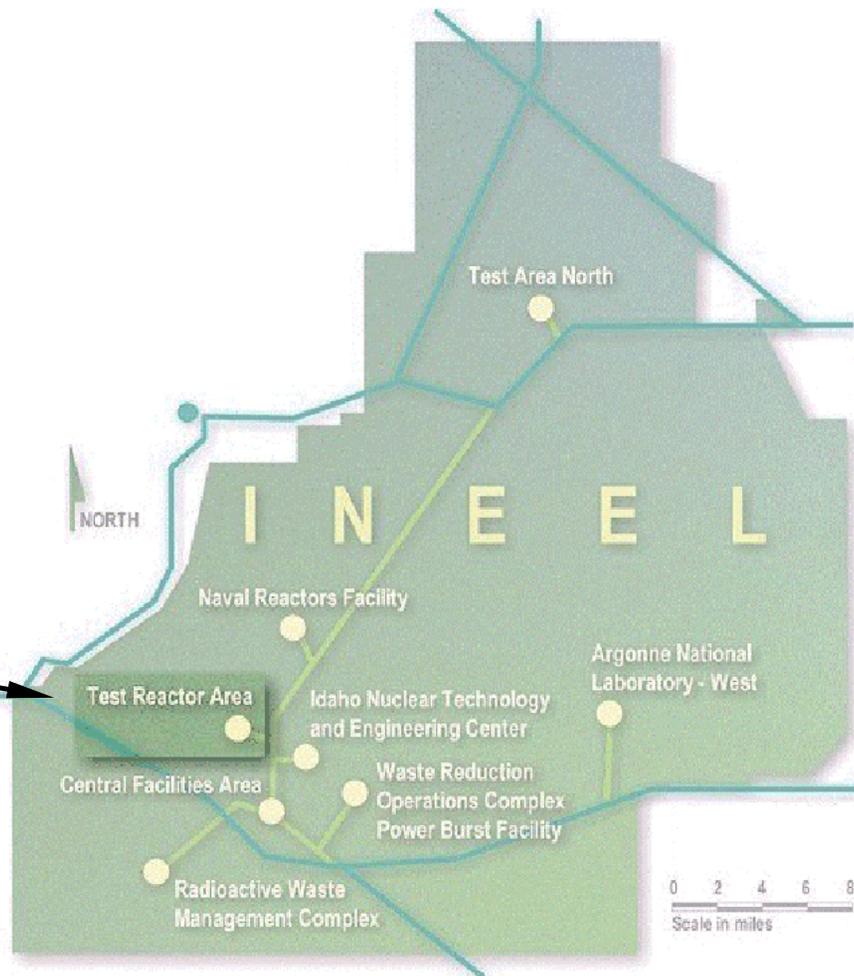
# Test Reactor Area

*Brian S. Anderson*  
*U.S. Department of Energy*

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# Test Reactor Area



# The Test Reactor Area



# Advanced Test Reactor



## ATR Mission – Dedicated to Nuclear Materials Research

- The main purpose of the ATR is to accelerate reactor materials and fuels testing in prototypic reactor conditions.
- ATR produces very high neutron flux levels
  - $1 \times 10^{15}$  neutrons/cm<sup>2</sup> sec thermal flux
  - $5 \times 10^{14}$  neutrons/cm<sup>2</sup> sec fast flux
- Reactor materials and fuel testing is accelerated in ATR by a factor of 10 or more

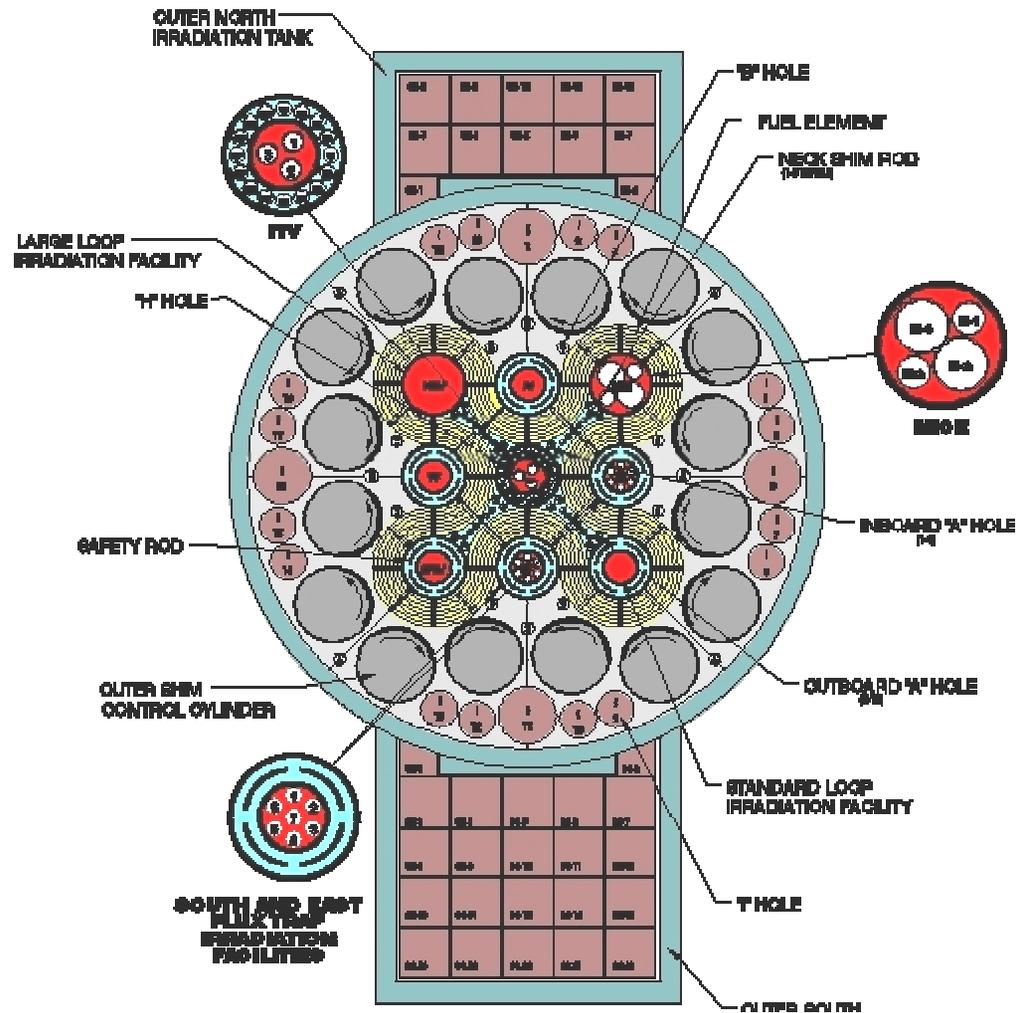


# The Advanced Test Reactor is the World's Most Capable Test Reactor

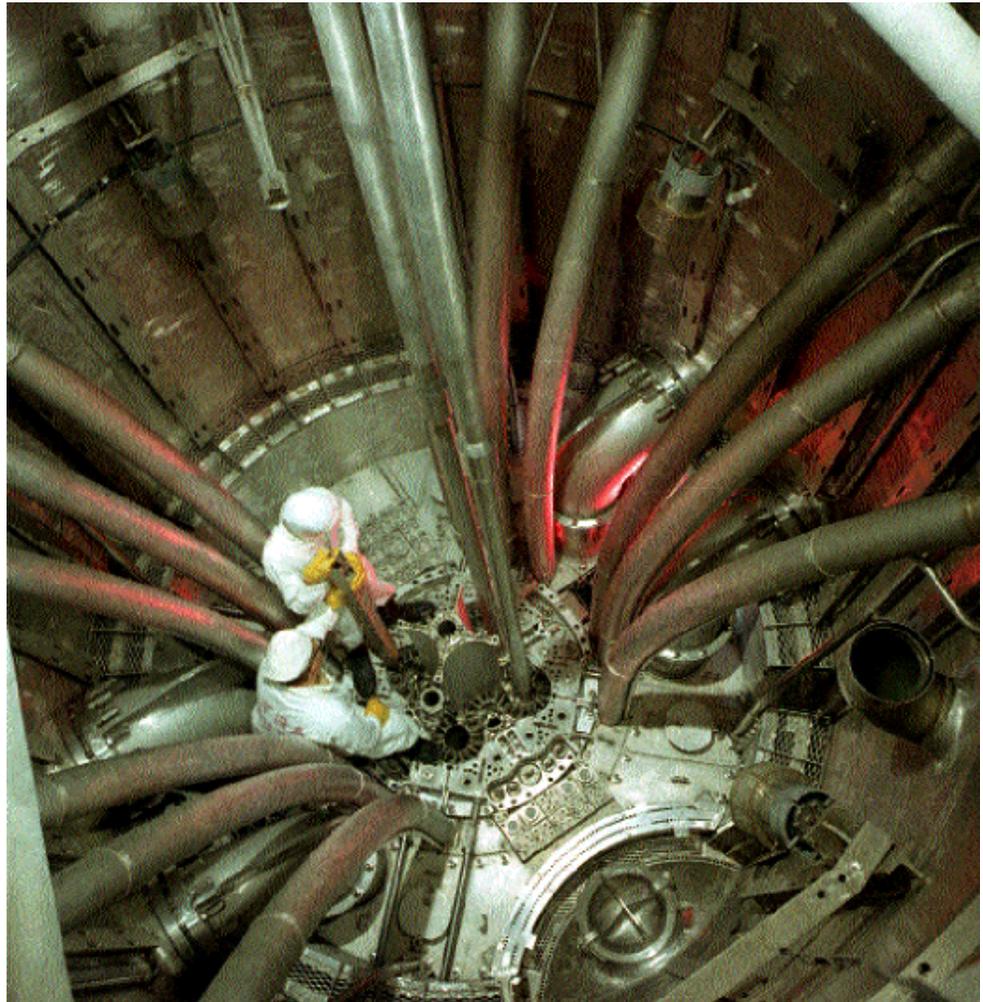
- 250 MW Thermal Design Power
- Low Pressure & Temperature (300 psi, 150°F)
- Pressurized Water Loops for testing at design pressure, temperature and chemistry
- Large Flux Traps (4.1" & 1.8" ) for experiments
- Multiple Irradiation Capsule Experiment (MICE)
- Irradiation Test Vehicle (ITV)
- Numerous Drop in Capsule Irradiation Positions



# ATR Core Cross Section Diagram



***Inside the  
ATR Vessel  
During  
Construction  
(circa 1967)***



# Examples of ATR Customers

- Naval Fuels and Material Testing (DOE)
- Fusion Reactor Material Testing (DOE)
- Reactor Vessel & Weld Material Testing (Japan)
- Space Reactor (SP-100) Material Testing (DOE)
- Reduced Enrichment Research & Test Reactor (DOE)
- Commercial radioisotope production (e.g.  $^{192}\text{Ir}$ ,  $^{60}\text{Co}$ )
- CANDU materials testing (Canada)
- Graphite Oxidation and Aging (United Kingdom)



# Potential Future Users of the ATR

- Pu-238 production for space applications (DOE)
- Advanced Fuel Cycle Initiative (DOE)
- Nuclear Power 2010 Initiative-Advanced Gas Reactor Fuel Testing (DOE)
- Generation IV Initiative, fuels and materials testing (DOE)



# TRA Security Enhancements

- TRA specific security requirements protect ATR fresh fuel from unauthorized access or diversion
- Security system upgrades are planned to provide additional protection at the ATR and the NMIS storage facility
- Funding provided by the INEEL Physical Security Program



# TRA Reactor Programs Support to the Advanced Test Reactor

- ATR Critical facility – nuclear physics measurements
- TRA Hot Cells – irradiated material handling and inspection, ATR (non-NR test assembly
- ES&H – Radiological Controls, Environmental Compliance, Waste Management, Env. Projects
- TRA Engineering – plant systems support, ATR and experiment safety analysis, experiment test program
- Maintenance – reactor system PM and repair
- Training – Training and Qualification of personnel
- Environmental, Safety, Health & Quality Assurance



# Other TRA Organizations

- T RA Projects – Construction Management
- Program Integration – Financial management and document control
- Security Force – Physical security
- Research and Development– nuclear Radiation Measurements Laboratory, STAR Lab.
- Cafeteria & Warehouse
- Bechtel-Bettis – on-site NR test representative



# Reactor Programs Budgets (x \$1K)

Reactor Programs	NE - TRA Facilities	NR - ATR Program	Other Customers	Total TRA Budget
FY-2002	\$8,588	\$51,476	\$2,660	\$62,724
FY-2003	\$11,155	\$54,671	\$2,886	\$68,712
* FY-2004	\$12,530	\$54,900	\$2,500	\$69,930

