Sandia National Laboratories
Technical Area V
Capabilities and Accomplishments

Presented to the TRTR/IGORR 2010 Meeting, Knoxville, Tennessee
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September 21, 2010

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TA-V
LEADING NUCLEAR TECHNOLOGIES

TA-V Nuclear Technology Overview

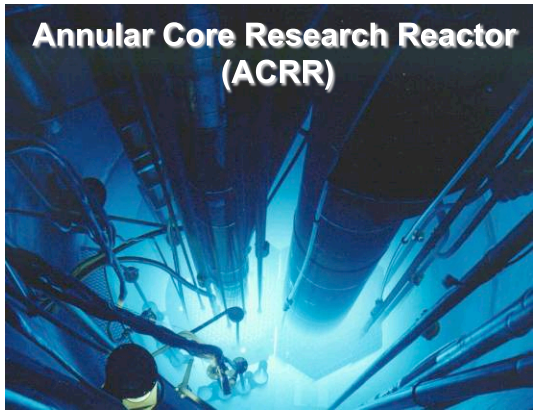
Four nuclear facilities operated for the U.S. DOE

- Nuclear reactor facilities
  - Sandia Pulsed Reactor Facility Critical Experiments (SPRF/CX)
  - Annular Core Research Reactor Facility (ACRRF)
- Nuclear non-reactor facilities
  - Gamma Irradiation Facility (GIF)
  - Auxiliary Hot Cell Facility (AHCF)

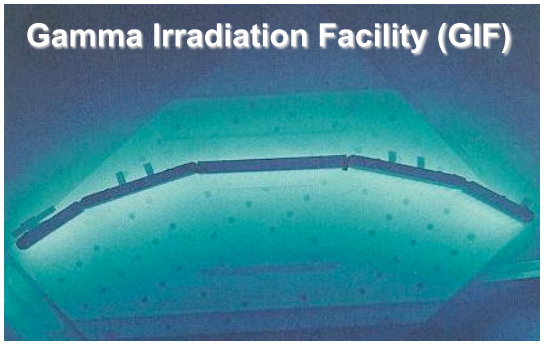
Proposal for new building to consolidate facilities

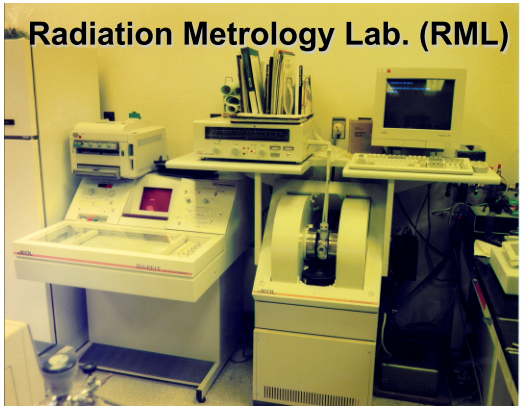
TA-V Nuclear Facilities
Unique Capabilities

A complete range of nuclear and radiation facilities for research, development, and testing



- Radiation effects testing
- Reactor safety experiments
- Fuel cycle research
- Medical isotope production
- Space nuclear power





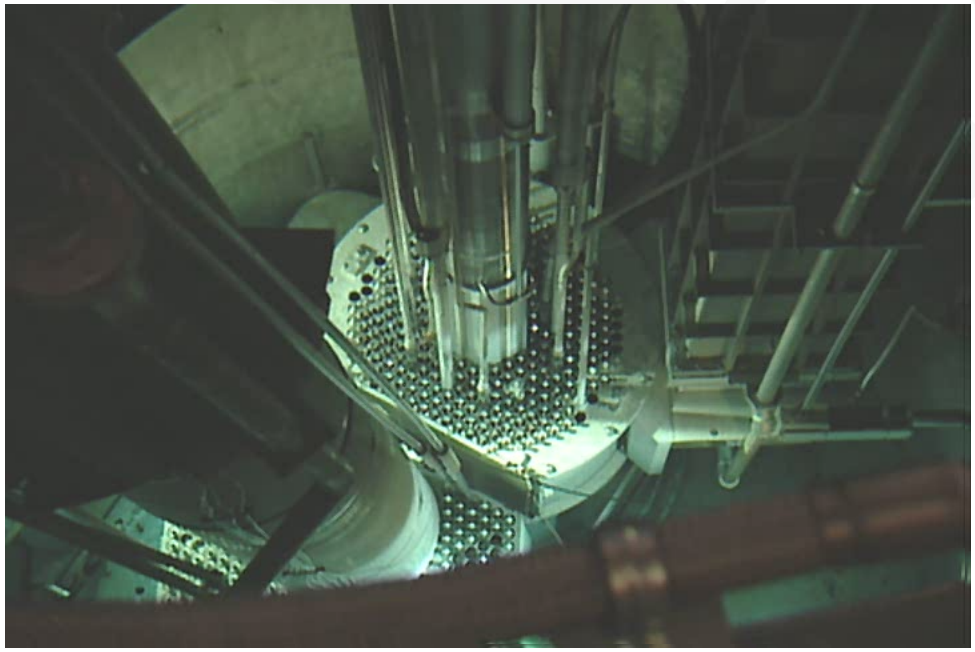
TA-V
LEADING NUCLEAR TECHNOLOGIES

Sandia Pulsed Reactor Facility Critical Experiments

- Initial criticality May 2009
- Fuel from Penn State
- Operational campaigns of 2 to 3 weeks, 3 or 4 times a year
- Current experiments supported by NNSA Nuclear Criticality Safety Program
  - 7% fuel enrichment
  - Benchmark computer codes
  - Nuclear criticality safety training

Annular Core Research Reactor Facility

- Pulse repeatability studies (see presentation)
- Optical fiber radiation effects studies
- Computer code validation to predict radiation induced changes in electronic components at ambient and cryogenic temperatures
- Development of specialty, high intensity gamma field radiation detectors using industrial diamonds



ACRRF 300 MJ/35 GW pulse

Annular Core Research Reactor Facility

- Steady state power 4 MW
- Maximum pulse power 60 GW
- Maximum pulse energy 500 MJ
- Neutron radiography

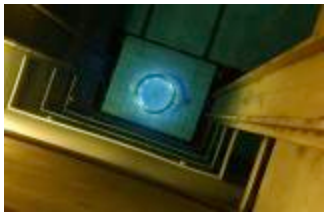
Gamma Irradiation Facility

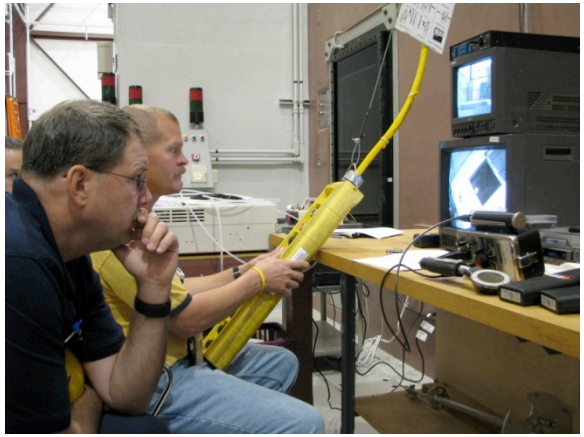
- Hazard category 3 nuclear facility
- Used to evaluate the effects of high energy gammas on various materials (space components, weapons components, cherry seeds, etc.)
- 3 irradiation cells, 1 with large movable wall to facilitate irradiation of large items (such as an M60 tank)
- Approximately 232 kCi of Co-60
- Filmed for Discovery Channel special (awaiting scheduling of premier)

Gamma Irradiation Facility

Source transfer September 2010

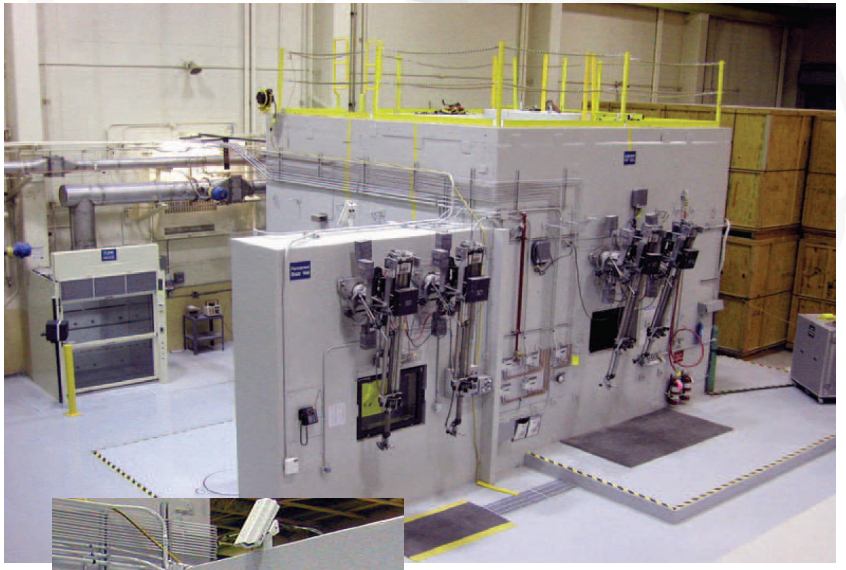
- Removed 224 Atomic Energy of Canada (AECL) Co-60 source pins from the GIF and returned to the original manufacturer
- Total Curies: ~10,000
- Some sources dated back to 1963





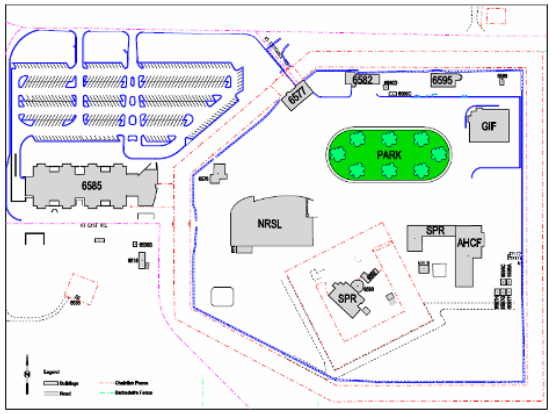
Auxiliary Hot Cell Facility

- Hazard category 3 nuclear facility
- Facility in startup phase (Federal Operational Readiness Review completed) to characterize and repackage radioactive material
- Facility includes fume hood and hot cell with manipulators to allow for remote operations



Neutron Research and Survivability Laboratory

- Proposed design of TA-V multi-facility building
- Aligns to DOE Complex 2030 goals and advantageous to the nation's nuclear weapons complex
- Critical for future computer validation for radiation environments
- Critical for survivability verification and validation for all weapons systems
- Replaces current legacy facilities (>42 years old)
- Designed to nuclear facility safety standards
- Extends ACRRF operational life for 60 years to utilize the unique, irreplaceable fuel worth ~$200M



Proposed new TA-V

Questions?

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