



# NRIC

NATIONAL REACTOR INNOVATION CENTER  
AT SANDIA NATIONAL LABORATORIES

*State of the art capabilities and facilities to support nuclear energy technology development and Launchpad USA*

At Sandia National Laboratories, we pride ourselves on our state-of-the-art capabilities and facilities that are designed to foster innovation and collaboration. Our extensive range of resources includes advanced laboratories equipped with cutting-edge technology and specialized research environments that support a diverse array of scientific disciplines.

**More than reactors, Sandia delivers whole-system energy solutions from beginning to end to support Launchpad USA developers**

Our scope covers the front end and back end of the nuclear energy fuel cycle, including safety and risk assessment, physical and cyber security, safeguards, transportation and packaging, accident consequences and emergency response, and long-term disposal of spent fuel and radioactive materials.



## Safety & Emergency Preparedness

- Safety and risk analysis (MELCOR)
- Consequence management and analysis (MACCS)
- Criticality safety
- Radiation effects
- Operator criticality training

## Physical and Cybersecurity

- Cyber- and physical security by design (ARCADE, PathTrace)
- Domestic and international safeguards

## Nuclear Fuel Cycle Modeling, Experimental & Deployment

- Fuels testing, reprocessing, procurement and logistics
- Spent fuel management
- Materials testing
- Large-scale validation and testing
- Non-nuclear component testing and modeling
- Molten salt chemistry and testing

## Power Conversion & Grid Integration

- Grid readiness, resilience, and integration
- Non-electric applications and industrial integration
- Energy conversion/sCO<sub>2</sub> Brayton Cycle

## Performance Optimization & Digital Engineering

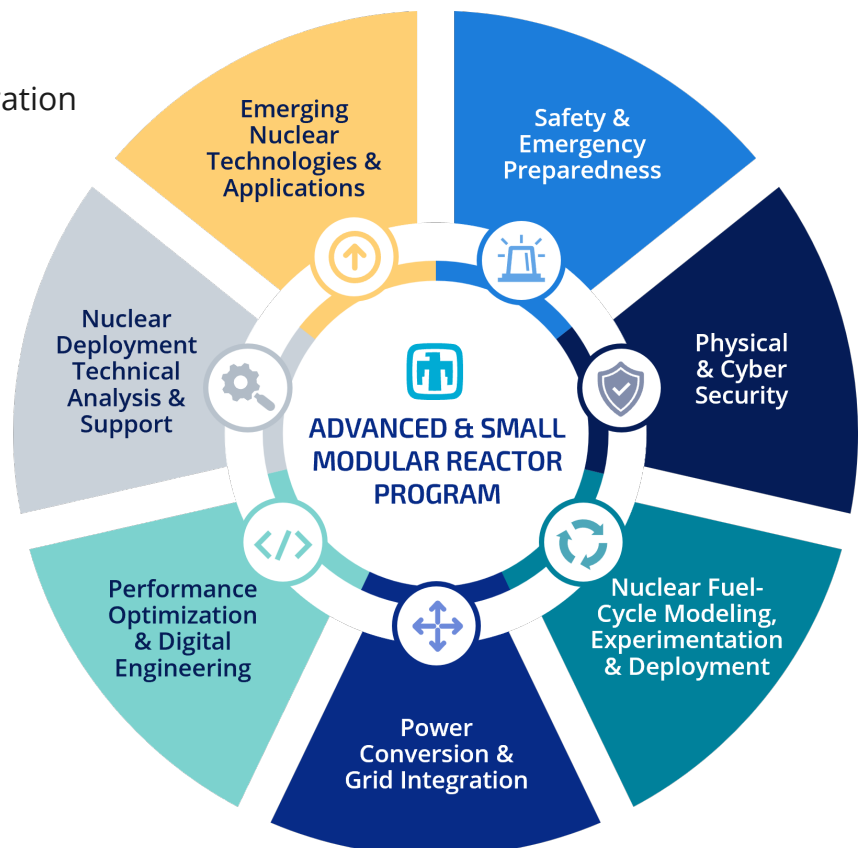
- Reactor systems and physics
- AI/ML performance testing and modeling
- AI-driven operations and plant digitalization

## Nuclear Deployment Technical Analysis & Support

- Community engagement and outreach
- Permitting
- Sociotechnical systems analysis
- Workforce planning

## Emerging Nuclear Technologies & Applications

- New fuels
- Space nuclear applications
- AI
- Nuclear fusion



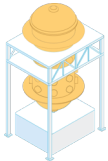
# KEY TESTING CAPABILITIES



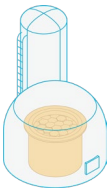
The **Lurance Canyon Burn Site** offers controlled fire environments in which to perform fundamental studies, simulate transportation and handling accidents for nuclear safety studies, and evaluate and certify hazardous materials shipping containers.



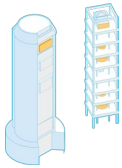
The **Aerial Cable Facility** offers drop and high-velocity impact testing, suspension of large items hundreds of feet above the ground and simulated free flight along an aerial cable. This is the high-level description of this section. Another sentence may be here.



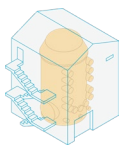
The **Cylindrical Boiling Facility (CyBL)** is a stainless-steel reactor-scale facility, designed for thermal hydraulic investigations and fire ignition related to nuclear power plant safety.



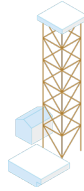
The **Sandia Pulsed Reactor Facility (SPRF)** is designed to conduct benchmark-quality experiments, supporting safe and efficient operations involving fissionable materials, including processing, handling, storage, packaging, and transportation



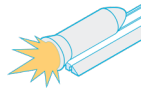
**National Solar Thermal Test Center and Molten Salt Test Loop.** High temperature testing environment to evaluate materials and heat transfer systems



The **Surtsey Testing Facility** simulates nuclear detonation effects and includes large testing areas, three spent fuel canisters, and a 1/10th scale nuclear power plant containment vessel with advanced instrumentation and control features.



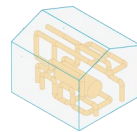
The 185-foot **Drop Tower Facility** provides a controlled environment for testing a wide variety of small and large test items, including those containing radioactive or high-explosives.



Sandia's **Rocket Sled Track** is a high-speed testing facility designed to evaluate the performance and safety of various materials and systems under extreme conditions, utilizing rocket-propelled sleds to simulate dynamic environments for research in defense, aerospace, and other applications.



The **Mobile Instrumentation Data Acquisition System (MIDAS)** is a versatile platform designed for real-time data collection and monitoring in various experimental environments, enabling enhanced analysis and decision-making during testing and research activities.



The **Brayton Cycle Test Loop** at Sandia National Laboratories is an experimental facility designed to study and optimize the performance of Brayton cycle power generation systems, focusing on advanced thermal energy conversion technologies for applications in nuclear and renewable energy.



**Annular Core Research Reactor & Gamma Irradiation Facility.** Powerful neutron and gamma testing environments to validate materials and components for advanced nuclear systems.