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SRNL is a DOE National Laboratory
operated by Savannah River Nuclear Solutions.

Facts

about Savannah River National Laboratory

U.S. DEPARTMENT OF ENERGY • SAVANNAH RIVER SITE • AIKEN • SC

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SRNL Fast Facts

- > Located at the U.S. Department of Energy's Savannah River Site near Aiken, South Carolina
- > Operated by Savannah River Nuclear Solutions
- > The National Laboratory for DOE Office of Environmental Management
- > Provides expert consultants in the areas of chemical, biological, radiological, and nuclear technologies to aid in addressing regional, national, and international security concerns
- > Supporting a range of international programs and partners, SRNL has completed work in over 50 countries across the globe

Contact Information

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SRNL Global and Homeland Security

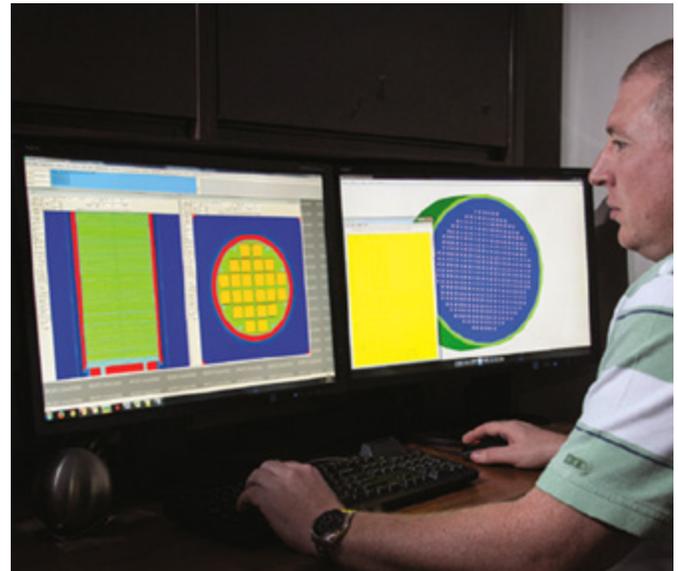
Modeling Capabilities

Using an array of computational modeling capabilities, the Savannah River National Laboratory (SRNL) provides scientific solutions tailored to the customer's needs. Global and Homeland Security employs a multi-disciplinary team with a broad range of engineering and scientific backgrounds experienced in manufacturing modeling solutions for a wide range of problems.

SRNL's modeling capabilities include radiation detection, nuclear modeling, atmospheric modeling, threat assessment, applied statistics, multi-physics, computational fluid dynamics, atomistic modeling and high performance computing. Modeling solutions, tools and data can be hosted on SRNL's Technology Assessment Data Archive and Analysis System (TADAAS). This system allows approved users to log on remotely from locations within the United States to work and collaborate in a smart analysis environment.

Radiation Detection

- Radiological/Nuclear spectral data analysis
- Radiation transport modeling
- Isotopic spectra analysis and determination
- Radiation dose modeling and detector modeling
- Monte Carlo N-Particle (MCNP), Gamma Detection Response and Analysis Software (GADRAS), Fixed-energy, Response function Analysis with Multiple efficiencies (FRAM)



Model development

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Nuclear Modeling

- Reactor core modeling
- Spent fuel analysis
- Shielding effects
- Radioactive material package design and analysis
- MCNP, Oak Ridge Isotope Generation (ORIGEN), Standardized Computer Analyses for Licensing Evaluation (SCALE)

Atmospheric and Surface Water Modeling

- Air contaminant transport/fate modeling for:
 - Emergency response consequence assessment
 - Nonproliferation source attribution
- Hydrologic and aqueous transport modeling
- Thermal signatures
- Natural hazards risk assessments

Process Modeling

- Discrete event modeling (material flow through complex systems)
- Nuclear material processing
- Nuclear material forensics

Threat Assessment

- Vulnerability Assessment Protection Option (VAPO)
- Hazard Prediction and Assessment Capability (HPAC)
- Risk assessment for a wide range of systems (marinas, nuclear material transport, patrol patterns)

High Performance Computing environment (above), SCALE/KENO-IV model of a BN-600 sodium-cooled fast breeder reactor (right).



Technology Assessment Data Archive and Analysis System (TADAAS)

- DHS External Information System approved to host DHS data
- Approved DHS users capable of accessing models/data remotely
- Analysis tools (e.g., MATLAB, MCNP) and job space available

Other Computational Capabilities

- Coupled multi-physics simulations
- Computation fluid dynamics and heat transfer
- Atomistic modeling (aid in spectral identifications)

High Performance Computing

- 200 nodes with 1,836 CPU cores structured for high-throughput applied models
- Scientific application development
- Custom database creation and user-friendly GUI development
- High-end data visualization
- Linux application integration
- Storage, Archive, Continuity of Operation (COOP)/Disaster Recovery



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