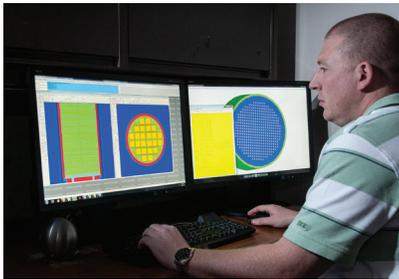


# Global Security

at the Savannah River National Laboratory

srnl.doe.gov

We put science to work.™



Model development



Systems operation support

## Modeling Capabilities

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

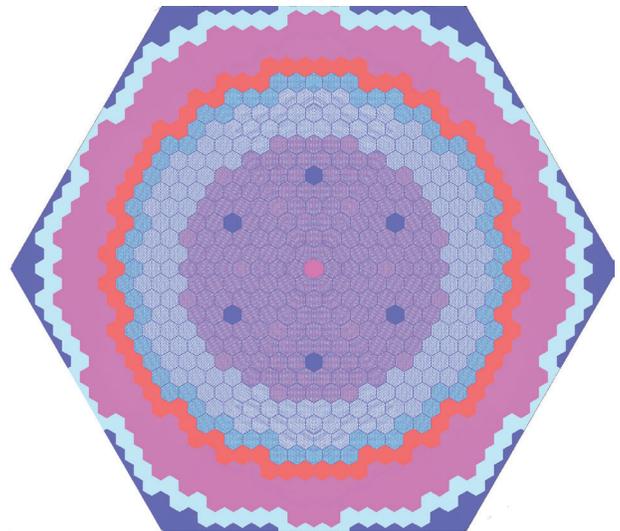
SRNL's modeling capabilities include radiation detection, nuclear modeling, atmospheric modeling, threat assessment, applied statistics, multi-physics, computational fluid dynamics, atomistic modeling and high performance computing. Modeling solutions, tools and data can be hosted on SRNL's Technology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

### Radiation Detection

- > Rad/Nuc spectral data analysis
- > Radiation transport modeling
- > Isotopic spectral 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)

### Nuclear Modeling

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



SCALE/KENO-VI model of a BN-600 sodium-cooled fast breeder reactor

### Interested in finding out more?

Contact:

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High Performance Computing environment

## Modeling Capabilities *(continued)*

### 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)

### 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
- > Computational 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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