

ORNL Has Extensive Expertise and Experience in Reactor System Design & Analysis

Key Applications

- **LWR, GCR, LMR Design, Analysis & Methods**
 - Space Fission Power Reactor for Surface Applications
 - IRIS – International Reactor Innovative & Secure
 - Clinch River Breeder Reactor
- **Support to NRC Licensing**
 - LWR – Power Upgrades & Standard Review Plan
 - Gas-Cooled Reactor – Accident Analysis & Knowledge Preservation
 - Advanced CANDU Safety Analysis
- **Design of Fuel & Materials Irradiation Exp.**
 - MOX Fuel Irradiation Experiments in ATR
 - Particle Fuel Irradiations in HFIR
- **Research Reactor Design & Analysis**
 - HFIR Safety Analysis and LEU Conversion
 - Advanced Neutron Source Reactor

Key Software

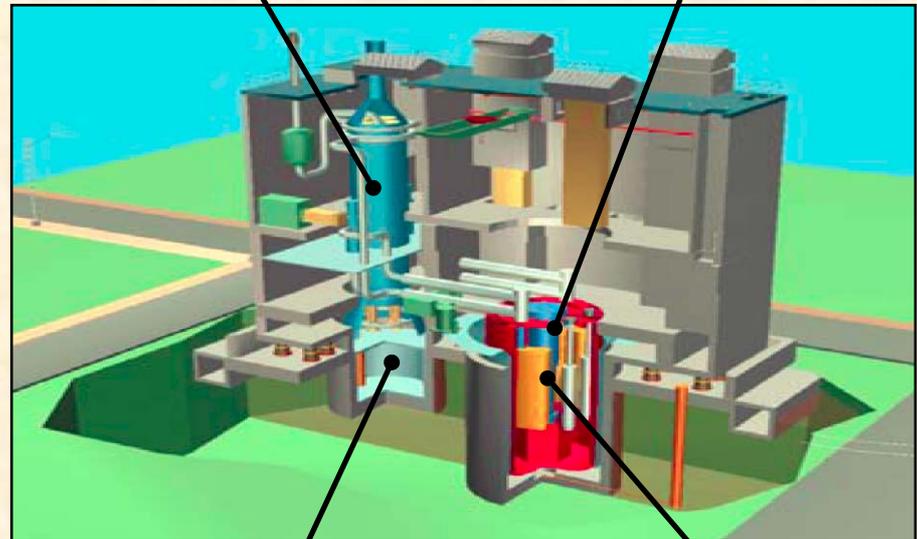
- **SCALE - Criticality Safety, Shielding, Lattice Physics and Source Terms***
- **DORT/TORT - Radiation Transport***
- **Bold Venture - Reactor Core Analysis***
- **GRSAC - Graphite Reactor Severe Accidents***
- **MCNP - Monte Carlo Transport**
- **FLUENT - Computational Fluid Dynamics**
- **SAPHIRE - Probabilistic Risk Assessment**
- **RELAP5 - Accident Analysis** **Developed at ORNL*

Reactor Systems

- Plant safety & PRA
- Economics
- Design optimization
- Controls and system dynamics

Thermal & Safety

- T/H Design and Safety Analysis
- T/H Experiments for Validation
- Fuel Performance and FP Release
- Probabilistic Risk Assessment



Shielding

- Shield design
- Radiation transport
- Materials activation and damage
- Radiological doses

Reactor Core Physics

- Core design and analysis
- Nuclear Data
- Analysis Methods & Validation
- Criticality Experiment Design