

Nuclear Energy Safety Technologies



The Nuclear Energy Safety Technologies Group focuses on analyses and experiments aimed at ensuring the safety and security of the nation's energy systems and infrastructure, with particular emphasis on civilian nuclear power.

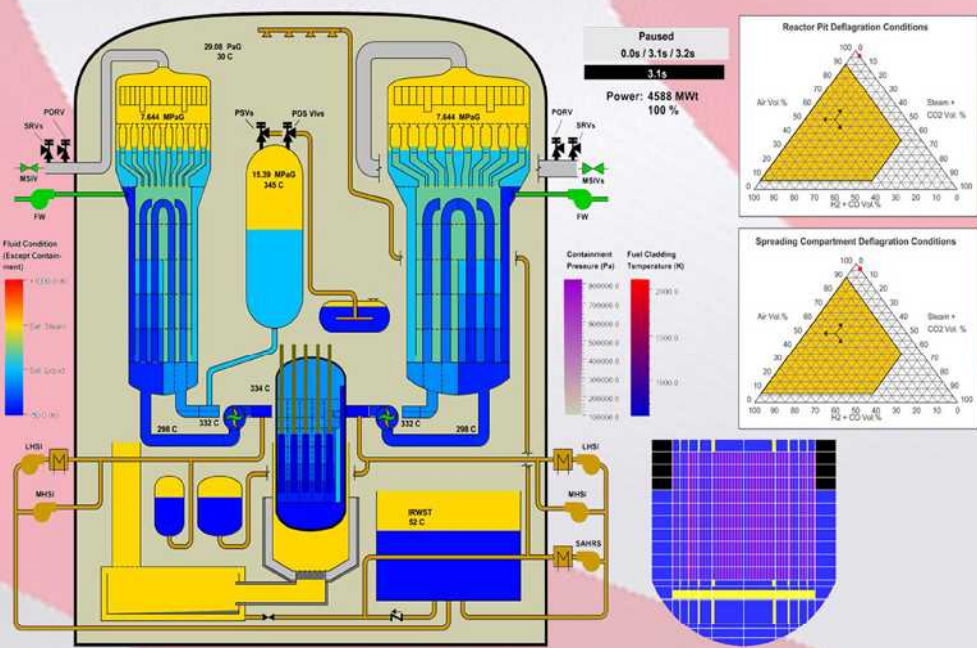
Risk and Reliability Analysis

Cable Failure Modes and Effects: Experimental investigations of fire-induced electrical cable failure modes and effects include both large- and small-scale testing. Cable failure can lead to unique nuclear safety challenges including false indications and the spurious operation of plant systems and equipment. (Steven Nowlen, 6761)

Fire Risk Analysis: SNL is a leader in the development of fire probabilistic risk assessment (FPRA) methods, tools, and data. Fire is a significant contributor to nuclear power plant severe accident risk. Reliable FPRA methods are critical to the implementation of risk-informed regulatory strategies. (Steven Nowlen, 6761)

Metal Fires and Their Implications for Advanced Reactors: This Laboratory Directed Research and Development project seeks to establish testing and analysis capabilities for assessing the safety of sodium-cooled advanced reactors (Tara Olivier, 6761)

Symbolic Nuclear Analysis Package (SNAP) Graphical Severe Accident Visualizer

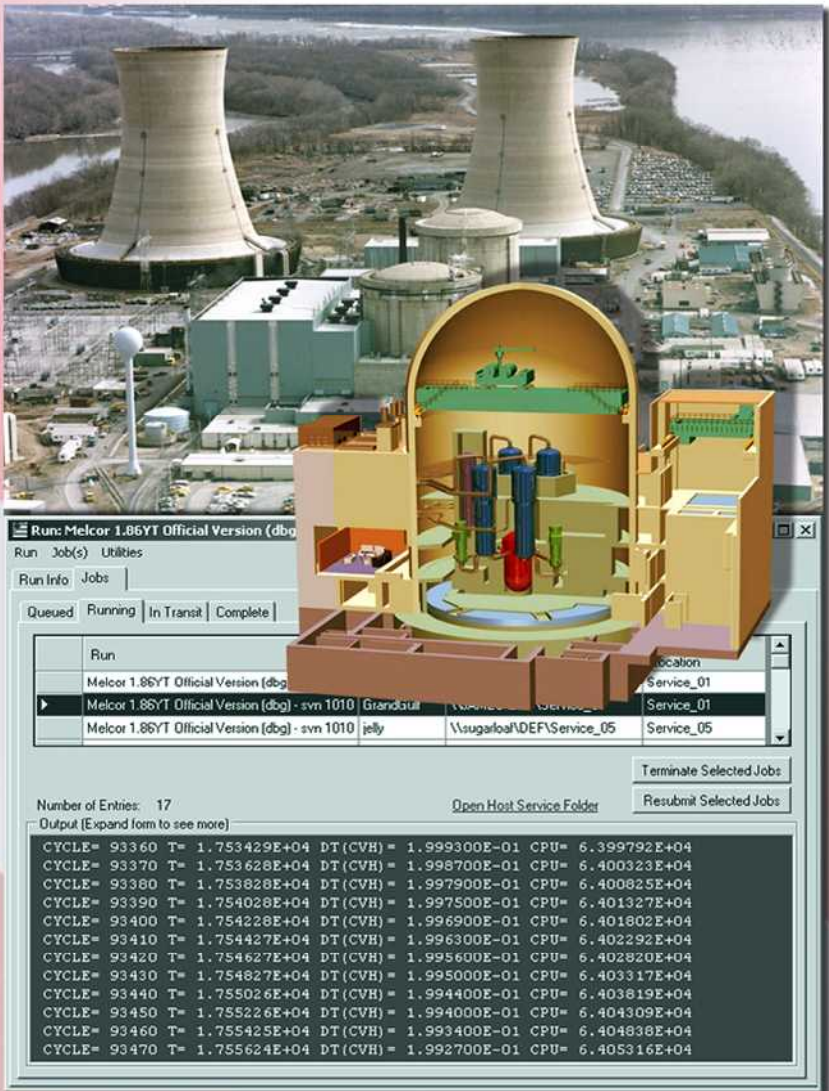


Spent Fuel Pool Experiments



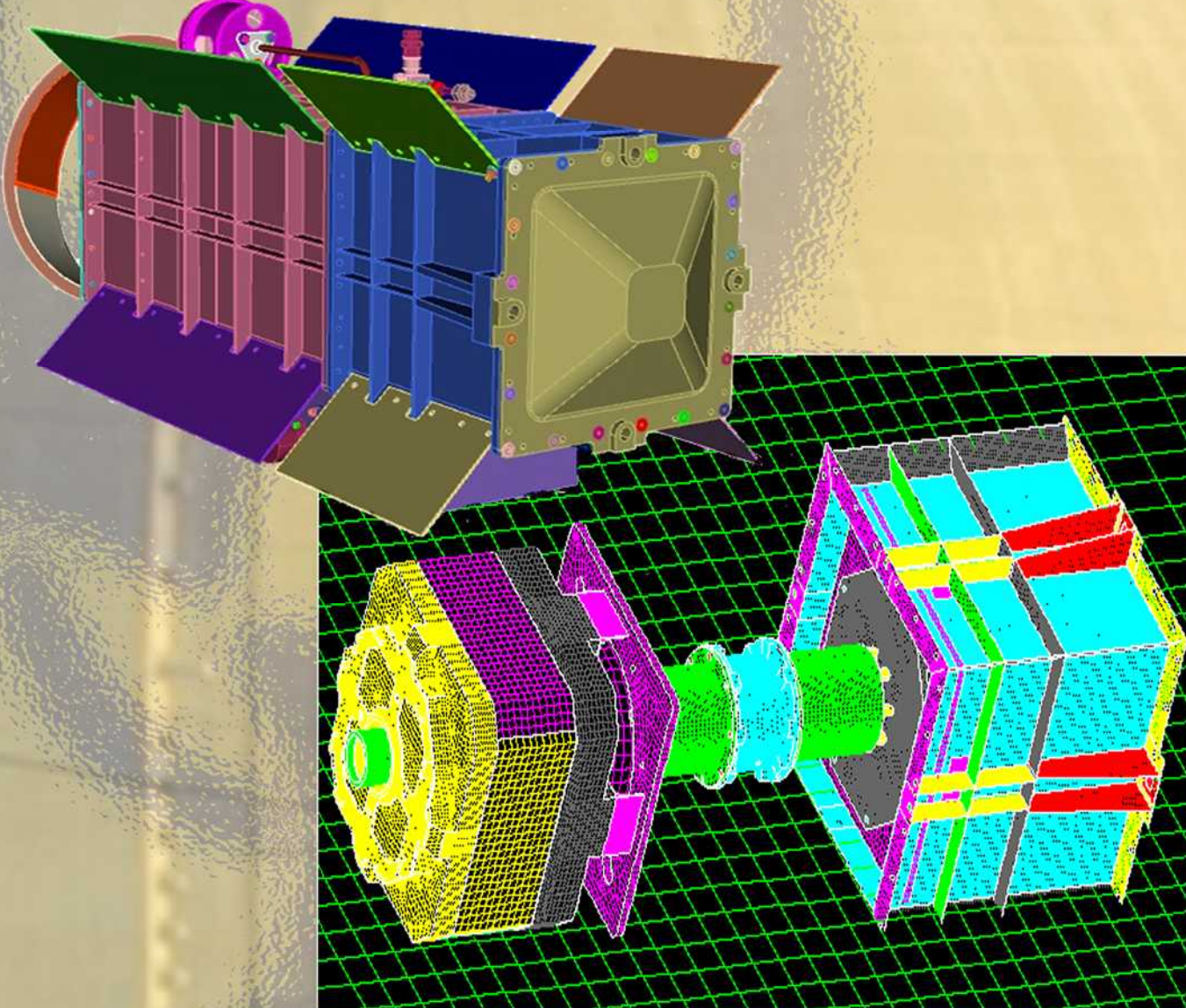
Experiments include NRC research into pool-draining accidents, electrically heated full scale prototypic fuel assemblies, and measuring thermal-hydraulic performance under air natural draft conditions leading to Zr-fire. Test results are impacting practices at nuclear power plants in the U.S. leading to safer operations. (Larry Humphries, 6762)

MELCOR



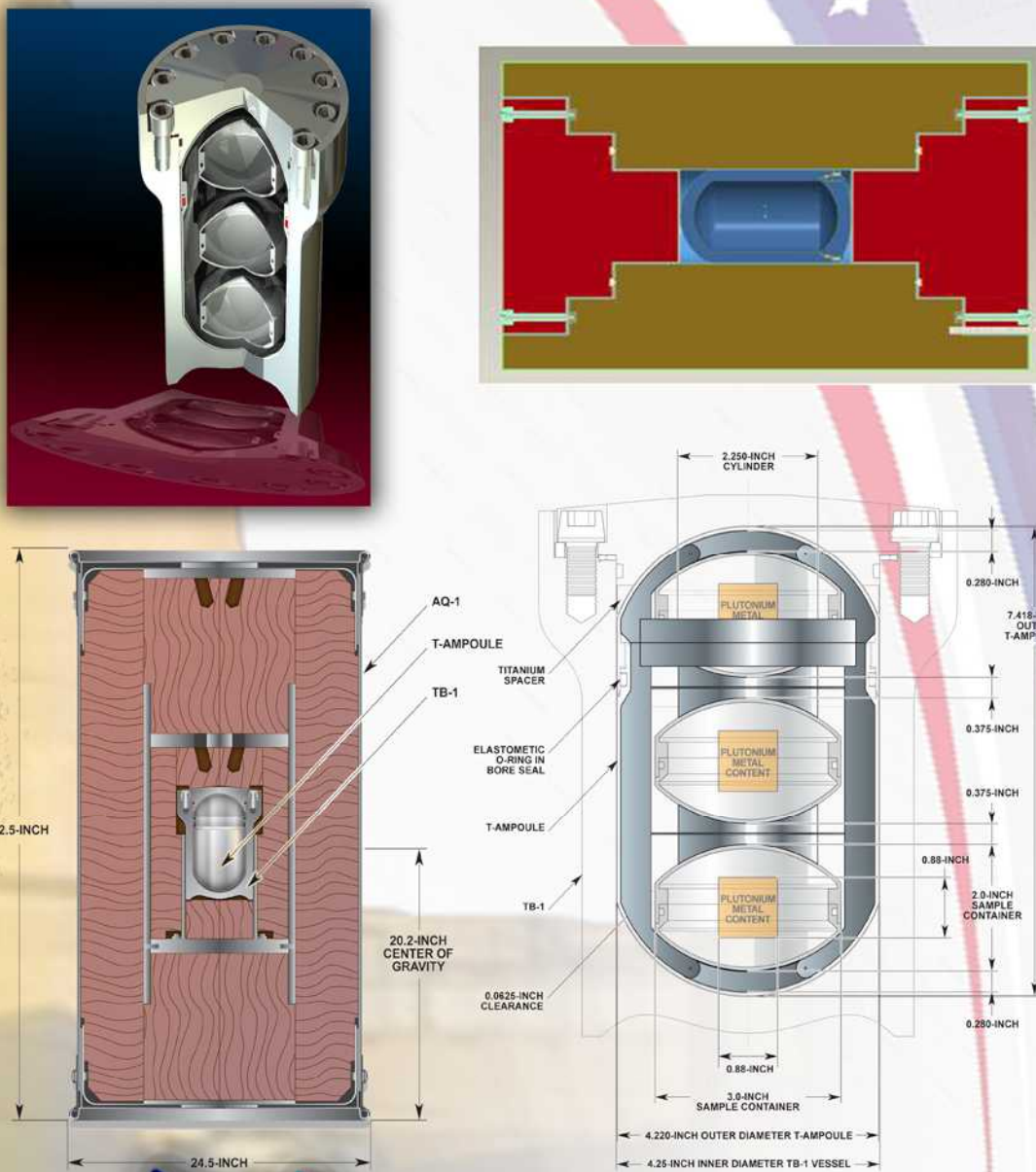
MELCOR performs a system level analysis of complex coupled phenomena ongoing during a severe accident in a nuclear power plant. MELCOR uses a control volume approach to model facility features together with best estimate physics treatment for severe accident processes such as reactor fuel heatup and damage, chemical reactions, fission product release and transport, aerosol mechanics, and plant engineered safety systems. (Randy Gauntt, 6762)

Launch Safety Advanced Stirling Radioisotope Generator (ASRG) Modeling

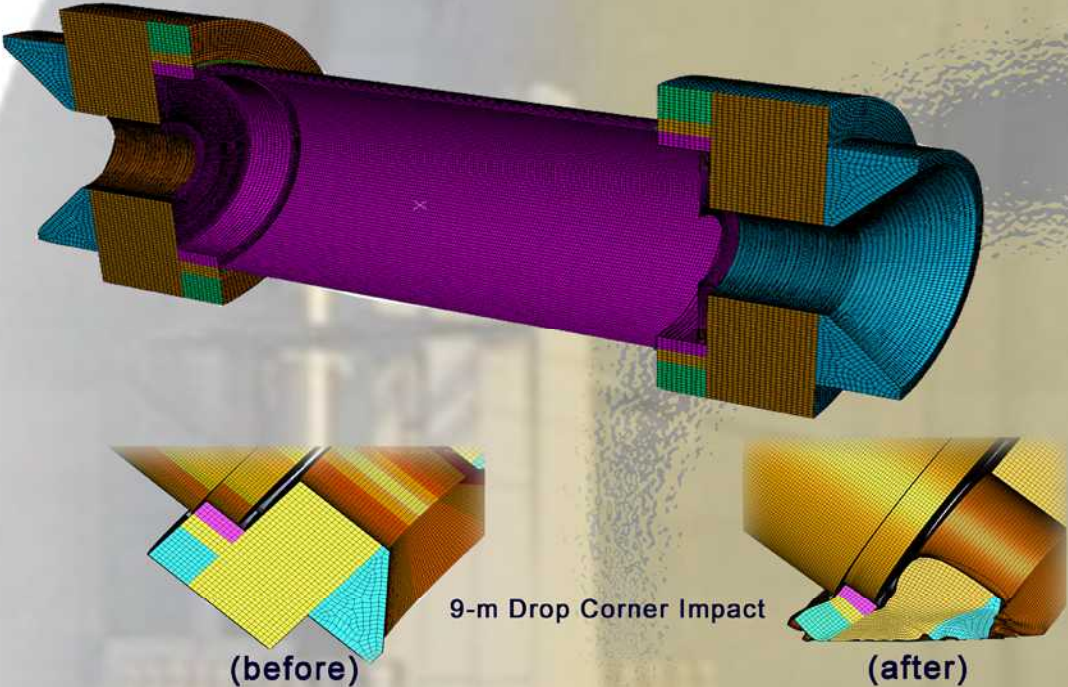


High speed impact modeling of launch accident environments are being performed for the ASRG used for missions to outer planets. Detailed finite element models capture the behavior of critical components of the ASRG for use in the larger launch safety analysis (Jason Petti, 6764)

Transportation and Environmental Safety
Our group supports WFO customers in the design, testing, and certification of high-integrity transport containers. (David Miller, 6765)



ENSA Rail Cask Impact Limiter



Sandia National Laboratories is tasked with designing, analyzing, and scale-model testing impact limiters for a new Type B 120,000 kg rail cask for the Spanish heavy nuclear equipment manufacturer, ENSA (Dave Harding, 6764, Doug Ammerman, 6765)

Environmental Restoration (ER) Project
The ER project is working to identify, characterize, and remediate legacy waste sites. (David Miller, 6765)



Liquefied Natural Gas (LNG) Tanker Cascading Damage Project

For this study, two LNG vessels are examined under different accident scenarios. The analyses performed examine the extent of the LNG flow, the cooling of the structure due to the cryogenic LNG, and the extent of damage due to the cryogenic temperatures. These analyses also explore the additional weakening or damage of the vessel due to external fires. (Jason Petti, 6764, Carlos Lopez, 6765)

