


Regulatory Decisionmaking: Halden Reactor Project

- Instrumented in-reactor testing of fuel and reactor materials
 - Update NRC's fuel codes and materials properties library, including innovative fuel designs such as ATF
 - Support audits of industry safety analyses
 - Assess spent fuel storage and transportation
- Loss-of-Coolant Accident test series
 - Enhanced NRC's fuel code calculations
 - Directly informed 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors"




Regulatory Decisionmaking: IRSN (FRANCE)

- Tested fission product releases and degradation of uranium dioxide and mixed oxide fuel
- Results provided under Cooperative Severe Accident Research Program (CSARP)
 - Validation of MELCOR code
 - Synthesized a revised design basis accident, NUREG-1465, "Accident Source Terms for Light-Water Nuclear Power Plants"
 - Supported the loading of mixed oxide lead test assembly in Catawba under the US-Russian disposition of weapons-grade plutonium program




Regulatory Decisionmaking: AREVA (KATHY Loop)

- Database of experimental information
 - Assessment of TRACE and evaluation of reactor core thermal-hydraulic models applied during simulations of anticipated transients without SCRAM (ATWS) events
 - Steady-state and stability testing is complete and experimental data has been transferred to the NRC
 - Final report is complete and being reviewed by the NRC
- Supports confirmatory analysis of licensing amendments for BWRs to operate in the maximum extended load line limit analysis plus (MELLLA+) expanded operating domain



Regulatory Decisionmaking: EPRI

- NRC/RES, EPRI, and NIST conducted extensive verification and validation study of fire models
 - NUREG-1824 (EPRI 101 1999), "Verification and Validation of Selected Fire Models for Nuclear Power Plant Applications"
 - Provide confidence in predictive capabilities of various models
 - Assist in transition to NFPA Standard 805
 - Conduct significance determination process reviews under the ROP



Collaboration to Advance Nuclear Safety

- AREVA (FRANCE) provided fission products criticality data
- Results provided as an in-kind contribution
 - Validation of SCALE code used to estimate the negative worth of fission products for PWR burnup credit
 - RES developed full (fission product and actinides) burnup credit consideration for PWR spent fuel
 - Revised, "Spent Fuel Project Office Interim Staff Guidance - 8"
 - Full burnup credit enable 80% to 90% of the PWR spent nuclear fuel assemblies to be loaded in high-capacity casks



Summary

- Safety research provides the technical basis that informs key regulatory decisions
- International and domestic collaboration improves the safety and robustness of these technical bases
- International and domestic collaboration reduces research cost