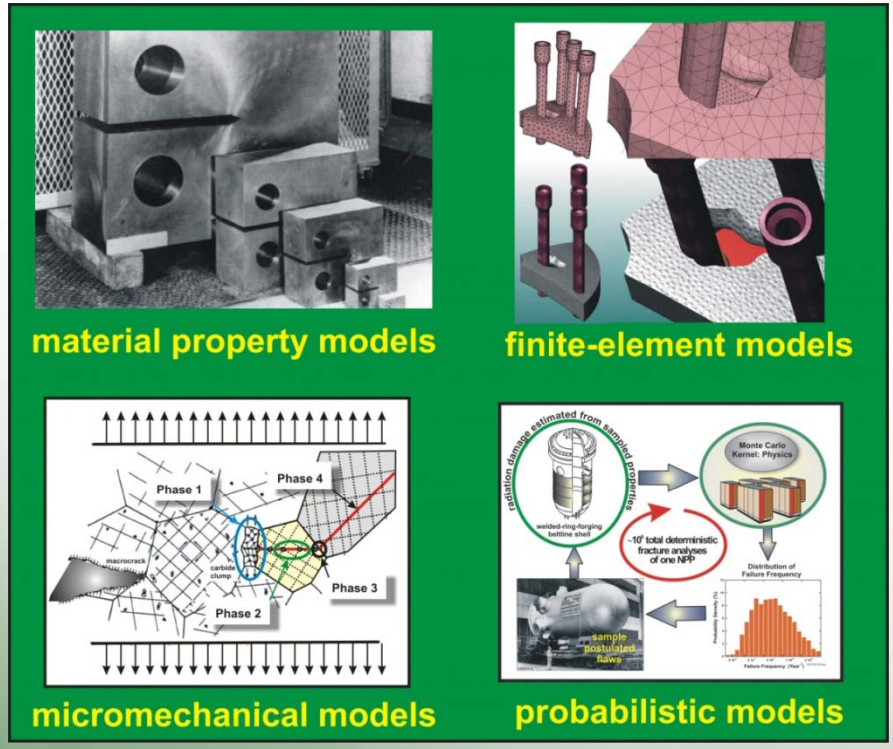
Probabilistic Pressure Boundary Integrity Safety Assessment (PISA) Program

Modeling and Simulation Group

Computational Sciences & Engineering Division



Problem Statement:

- **The U. S. Nuclear Regulatory Commission (NRC) requires leading-edge technical support to ensure the safety & reliability of pressurized components in U.S. nuclear power plants (NPP).**

Technical Approach:

- **CSED assesses the integrity of NPP components through (1) property models that characterize fracture resistance of materials; (2) finite-element models that predict behavior of damaged components; (3) micromechanical models based on fundamental physics of fracture; & (4) probabilistic models that provide risk-informed technical bases for regulation.**

Benefit:

- **CSED research results made a critical contribution to the technical bases for NRC's new Pressurized-Thermal-Shock Rule, with a projected savings in capacity replacement costs of approximately $20 billion.**

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