U.S. NRC Goals and Plans for Research to Support Risk-Informed Regulation

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Goals for Risk-Informed Regulation

- **Commission established new policies for risk-informed regulation in 1996**
  - **Focus on licensee activities commensurate with their significance to public risk**
  - **Utilize probabilistic risk assessment (PRA) methods, to the extent feasible, in a risk-informed regulatory framework**

Research to Support Risk-Informed Regulation

- **Availability of analytical tools is key to success of risk-informed regulation**
- **Office of Research, U.S. NRC is actively conducting research to improve PRA methods**

Key Areas of Research

- **Human reliability analysis**
  - **Atheana method developed**
- **Fire risk analysis**
  - **Fire modeling**
  - **Circuit failure analysis methods**
  - **Significance determination process**
  - **Fire risk requantification**

Fire Modeling Research

- **Evaluate capabilities and limitations of fire models for applications in nuclear facilities**
- **Benchmarking and validation of fire models**
- **Develop best-estimate methods and determine uncertainties in predictions**

International Collaborative Project for Fire Modeling

- **Project established in 1999**
- **Report on 1st benchmark exercise on cable tray fires completed**
- **Contributions from all participants of significant value to the NRC**
- **NRC intends to continue its full support of the project**

Memorandum of Understanding between NRC and NIST

- **MOU established in February 2000**
- **Evaluate NIST fire codes, CFAST and FDS, for adoption in NRC's regulatory framework**
- **NRC staff detailed to NIST**
- **Mutual interest and benefits to both government agencies**

NRC Proposal for International Validation Exercises

- **NRC will sponsor full-scale tests at NIST for international benchmark exercises**
- **Test program planned for 3 years from 2002 to 2004**
- **NRC invites project participants to exercise respective fire models**
- **NRC solicits input for program**

NRC Goals for Validation Program

- **Benchmark range of fire models**
  - **Empirical models used in NRC inspection process**
  - **FIVE (Revision 1) methods to be used in NRC/EPRI requantification program**
  - **CFAST and other zone models**
  - **FDS and other CFD models**
  - **Lumped-parameter models**

NRC Goals for Validation Program – Cont'd

- **Determine suitable models for best-estimate predictions for range of scenarios**
- **Determine margins in predictions for different types of models**
- **Determine uncertainty in predictions**