



PRA Research to Enhance Decision-Making

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Presentation Purpose

- Provide Information and Status on Current Initiatives
- Solicit Feedback

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Role of NRC PRA Research Program

- Support NRC's Licensing Offices by Producing Technical Studies, Methods and Tools, and Regulatory Guidance
- Responsive to User Needs and Commission Direction

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PRA Technical Adequacy

- Consensus Standards
- Reg Guide 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (Mar 2009)
- NUREG-1855, "Guidance on the Treatment of Uncertainties Associated with PRAs in Risk-Informed Decisionmaking" (Mar 2009)
- Workshop (May 2009)
- Training

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Risk Assessment Standardization Project

- Methods and Guidance for Consistent Risk Assessment Results
- Inspection Findings, Operational Events, Precursor Analysis
- Internal Events Analysis, External Events Analysis, SPAR Model Reviews
- Common-Cause Failure Analysis, Low-Power and Shutdown Events, Human Reliability Analysis

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Digital Instrumentation & Controls

- Traditional Methods
 - NUREG/CR-6962, "Traditional Probabilistic Risk Assessment Methods for Digital Systems" (Oct. 2008)
 - Draft NUREG/CR, "Modeling a Digital Feedwater Control System Using Traditional PRA Methods" (Fall 2009)
- Dynamic Methods
 - NUREG/CR-6901, "Current State of Reliability Modeling Methodologies for Digital Systems and Their Acceptance Criteria for Nuclear Power Plant Assessments" (Feb. 2006)
 - NUREG/CR-6942, "Dynamic Reliability Modeling of Digital Instrumentation and Control Systems for Nuclear Reactor Probabilistic Risk Assessments" (Oct. 2007)
 - NUREG/CR-6985, "A Benchmark Implementation of Two Dynamic Methodologies for the Reliability Modeling of Digital Instrumentation and Control Systems" (Feb. 2009)
- Probabilistic Modeling of Software Failures
- OECD/WGRisk Digital I&C Reliability

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PRA Technical Issues

- Support System Initiating Event Analysis
- Treatment of Loss of Offsite Power
- ECCS Injection Post-Containment Failure
- Containment Sump Recirculation
- HRA Dependencies and Recovery Modeling
- Thermal Hydraulic Success Criteria

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Fire Modeling and PRA

- Support for 50.48(c)/NFPA-805 Implementation
- Fire Modeling Users Guide for NPPs
- Cable Flame Spread & Heat Release Rate Testing
- NRC/EPRI Fire PRA Training Course (June 2009, October 2009)
- HRA for Post-Fire Human Actions
- DC Circuit Spurious Actuation Testing
- Fire Events Database

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Human Reliability Analysis

- International Empirical HRA Study
- HRA Model Use in Decision-Making
- Human Event Repository and Analysis System
- Assessment of U.S. Crew Performance?

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