



Organized by:  
 Office of Nuclear Regulatory Research  
 United States Nuclear Regulatory Commission  
 Washington, DC 20555



# Nuclear Safety Research Conference 2004

<b>SESSION SCHEDULE &amp; ROOM LOCATIONS</b>			
<b>MONDAY</b>	8:30 am	Plenary Session: NRC Chairman's Keynote Speech	Grand Ballroom
	10:00 am	Session 1 Session 2	Salons A, B Salons C, D
	12:00 noon	Lunch	See Hotel for Restaurant Specials
	1:30 pm	Session 1 (cont'd) Session 2 (cont'd)	Salons A, B Salons C, D
<b>TUESDAY</b>	8:30 am	Plenary Session: NRC Commissioner, Speaker	Grand Ballroom
	9:30 am	Session 3a Session 4	Salons A, B Salons C, D
	11:30 am	Lunch	See Hotel for Restaurant Specials
	1:00 pm	Session 3b Session 4 (cont'd)	Salons A, B Salons C, D
<b>WEDNESDAY</b>	8:30 am	Session 5 Session 6	Salons A, B Salons C, D
	11:30 am	Lunch	See Hotel for Restaurant Specials
	1:00 pm	Session 5 (cont'd) Session 7	Salons A, B Salons C, D
	3:30 pm	Closing Remarks and Audience Feedback	Grand Ballroom

Susan Monteleone, BNL, Conference Coordinator

8:30

## Plenary Session (Grand Ballroom)

### Opening Remarks and Welcome

Carl Paperiello, Director, Office of Nuclear Regulatory Research

9:00

Keynote Speaker: Nils J. Diaz, NRC Chairman

9:45

Break

### 1 MATERIALS AGING AND DEGRADATION RESEARCH

Chaired by: A. Hiser (NRC)

*Objective: To discuss consideration of failures of passive systems and components in risk assessments, and discuss two risk-informed initiatives involving passive failures. Results will be presented from materials degradation and aging research, emphasizing regulatory and safety insights.*

10:00 **Panel Discussion:**  
**The Role of Materials Degradation and Passive Component Failures in Risk Assessments**

Panel Members:  
K. Balkey (Westinghouse)  
K. Fleming (Consultant)  
M. Modarres (Univ. of Maryland)  
W. Shack (ANL)  
N. Chokshi (NRC), Panel Moderator

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### NEW REACTORS

Chaired by: M. Gamberoni (NRC)

*Objective: To discuss ongoing recent or planned NRC and industry safety research activities affecting new and advanced reactors and to discuss infrastructure to support next-generation reactor technology.*

- 10:00 Introductory Remarks, M. Gamberoni (NRC)
- 10:05 Regulatory Structure for New Plant Licensing: Technology-Neutral Framework, M. Drouin, T. King (NRC), J. Lehner, W. Pratt, V. Mubayi (BNL), D. Bley (Buttonwood Consulting)
- 10:35 Testing in the APEX Facility to Investigate Advanced Plant Thermal-Hydraulics, S. Bajorek (NRC)
- 11:05 NRC Nuclear Analysis Research for Reviewing the Advanced CANDU Reactor ACR-700, D. Carlson (NRC)
- 11:35 Advanced Nuclear Energy Research in the United States, C. Sink (DOE)

12:00

Lunch

### 1 cont'd MATERIALS AGING AND DEGRADATION RESEARCH

Chaired by: A. Hiser (NRC)

- 1:30 Development of Technical Basis to Support Risk-Informed Revision of the Pressurized Thermal Shock (PTS) Rule (10 CFR 50.61), M. EricksonKirk, et al. (NRC)
- 2:00 LOCA Frequency Evaluation Using Expert Elicitation, R. Tregoning, L. Abramson (NRC), P. Scott (Battelle)
- 2:30 Review of the Reactor Coolant Pressure Boundary Leakage Data and Requirements for U.S. Nuclear Power Plants, M. Srinivasan, D. Kupperman (NRC), W. Shack (ANL), P. Krishnaswamy, G. Wilkowski (Engineering Mechanics Corp.)
- 3:00 Break
- 3:15 Status and Results of NRC's Proactive Materials Degradation Assessment Program, J. Muscara (NRC)
- 3:45 A Knowledge-Based Approach to Management of Materials Degradation, R. Dyle (Southern Nuclear), A. Marion (NEI)

### 2 cont'd NEW REACTORS

Chaired by: M. Gamberoni (NRC)

- 1:30 ACR Research and Development, A. White, D. Wren (AECL)
- 2:00 Pebble Bed Modular Reactor Research and Development for an Innovative Small Reactor, E. Wallace (PBMR Pty., South Africa)
- 2:30 Break
- 2:45 **Panel Discussion:**  
**New Reactors**  
Panel Members:  
B. Carluec (AREVA)  
T. Leahy (INEEL)  
D. Modeen (EPRI)  
J. Riccio (Greenpeace)  
D. Wren (AECL)  
S. Rubin (NRC), Panel Moderator

8:30

## Plenary Session (Grand Ballroom) Guest Speaker: Jeffrey S. Merrifield, Commissioner, NRC

9:15

Break

3a

### SPENT FUEL RESEARCH

Chaired by: R. Meyer, M. Hodges (NRC)

*Objective: Dry storage and transportation casks impose unique temperature and pressure conditions on spent fuel rods, and the consequences of these conditions are considered in cask licensing. Research results under these conditions and their implications will be presented in this session.*

- 9:30 Introductory Remarks, R. Meyer (NRC)
- 9:45 Data Needs for the Transportation and Storage of High Burnup Fuel, R. Einziger, et al. (NRC)
- 10:15 Perspective on Requirements for Spent Fuel Storage and Transportation, A. Machiels (EPRI)
- 10:45 High-Burnup Cladding Mechanical Performance during Cask Storage and Post-Storage Handling and Transport, R. Daum, et al. (ANL)

11:30

Lunch

3b

### HIGH BURNUP FUEL UNDER LOCA CONDITIONS

Chaired by: R. Meyer, F. Akstulewicz (NRC), R. Yang (EPRI)

*Objective: Risk-informed, performance-based rulemaking is planned to revise 10 CFR 50.46 and Appendix K for LOCA analysis. Results of recent research will be presented, and these results will provide the technical basis for changing the embrittlement criteria in the rule.*

- 1:00 Realistic Analysis of Fuel Rod Behavior under Large-Break LOCA Conditions, M. Nissley, C. Frepoli, K. Ohkawa (Westinghouse)
- 1:30 Post-Quench Ductility of Advance Alloy Cladding, M. Billone, Y. Yan, T. Burtseva (ANL)
- 2:00 Results from Studies on High-Burnup Fuel Behavior under LOCA Conditions, F. Nagase, T. Fuketa (JAERI)
- 2:30 Overview of the CEA Data on the Influence of Hydrogen on the Metallurgical and Thermal-Mechanical Behavior of Zircaloy-4 and M5™ Alloys under LOCA Conditions, J-C. Brachet, et al. (CEA Saclay), J. Mardon (Framatome), P. Jacques, A. Lesbros (EDF)
- 3:00 Break
- 3:15 LOCA Integral Test Results for High-Burnup BWR Fuel, Y. Yan, T. Burtseva, M. Billone, (ANL)
- 3:45 LOCA Testing at Halden, E. Kolstad, W. Wiesenack, V. Grismanovs (Halden)

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### DEVELOPMENT OF A PRA INFRASTRUCTURE

Chaired by: M. Drouin (NRC)

*Objective: This session will consider insights on PRA Quality from SPAR and ASP, phased approaches (e.g., Rg 1.200), and international activities. A panel discussion on PRA methods & tools will debate our limitations, priorities, and whether future risk applications might require additional PRA tools, methods and guidance. Additionally, modeling organizational factors, integrating equipment aging into the PRA model, and quantifying the risk of low-power shutdown will be topics covered.*

- 9:30 Introductory Remarks, M. Drouin (NRC)
- 9:45 Insights on PRA Quality from the SPAR Model Development Program, P. O'Reilly, M. Cheok (NRC)
- 10:15 Human Reliability Analysis (HRA) Good Practices, E. Lois (NRC), A. Kolaczowski (SAIC), J. Forester (SNL)
- 10:45 The Joint U.S. NRC/EPRI Fire Risk Requantification Study, J. Hyslop (NRC)

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### cont'd DEVELOPMENT OF A PRA INFRASTRUCTURE

Chaired by: M. Drouin (NRC)

- 1:00 Phased Approach to Achieving an Appropriate Quality for PRAs for Regulatory Decision Making, G. Parry (NRC)
- 1:30 Guidance on the Treatment of Uncertainties and Alternative Approaches used in PRAs, M. Drouin (NRC)
- 2:30 Break
- 2:45 **Panel Discussion:  
PRA Methods & Tools**  
  
Panel Members:  
J. Gaetner (EPRI)  
G. Holahan (NRC)  
J. Lanore (IRSN)  
J. Malloy (ANS)  
J. Riccio (Greenpeace)  
M. Drouin (NRC), Panel Moderator

## 5

### RADIATION PROTECTION

Chaired by: C. Trottier (NRC)

*Objective: To discuss current initiatives in radiation protection including new recommendations from the International Council on Radiation Protection (ICRP), the challenges of homeland security, and establishing a more robust materials program.*

- 8:30 Introductory Remarks, C. Trottier (NRC)
- 8:45 More Robust Research Plan for Radiation Protection, S. Bush-Goddard (NRC)
- 9:15 2005 Recommendations of the ICRP, E. Holahan (NRC)
- 9:45 Challenges in Radiation Protection and Homeland Security, C. Paperiello (NRC)
- 10:15 Break
- 10:30 Poster Session:
  - Development of an Environmental Effluent Database, A. Schwartzman (NRC)
  - VARSKIN Code, H. Karagiannis (NRC)
  - A PC-Based Radiological Toolbox, H. Karagiannis (NRC)

11:30

Lunch

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## 6

### CODES

Chaired by: S. Bajorek (NRC)

*Objective: To explore issues in developing and applying computer codes to analyze reactor systems. Topics will include the analysis, applications, and maintenance of codes, the status of the TRACE project, the analysis of source terms, and the assessment and modernization of the MELCOR code.*

- 8:30 TRACE: TRAC/RELAP Advanced Computation Engine, J. Staudenmeier (NRC)
- 9:00 MELCOR Development and Assessment, R. Gauntt (SNL)
- 9:30 Fuel Behavior Modeling in Accident Analysis, H. Scott (NRC)
- 10:00 Break
- 10:15 The U.S. NRC Spatial Kinetics Code PARCS, T. Downar (Purdue University)
- 10:45 Use of Computer Codes in the Regulatory Review Process, R. Landry (NRC)
- 11:15 Recent Developments in Multidimensional Modeling of Reactor Thermal Hydraulics using the NPHASE Code, M. Podowski, et al. (RPI)

## 5 cont'd

### RADIATION PROTECTION

Chaired by: C. Trottier (NRC)

- 1:00 **Panel Discussion:**  
**Research Issues in Radiation Protection**  
Panel Members:
  - R. Anderson (NEI)
  - M. Boyd (EPA)
  - C. Conklin (DHS)
  - G. Robertson (State of Washington)
  - T. Tenforde (NCRP)
  - C. Paperiello (NRC), Panel Moderator
- 3:15 Break

3:30

Closing Remarks and Audience Feedback

## 7

### OPERATING EXPERIENCE

Chaired by: J. Ibarra (NRC)

*Objective: To present the efforts to enhance the NRC Operating Experience Program utilizing the analysis conducted by RES. Prime concern is the impact on this program from the recommendations of the Davis Besse Lessons Learned Task Force and the August 14, 2003 Northeast Blackout.*

- 1:00 Overview of Approach to Reevaluate Station Blackout Risk, D. Rasmuson (NRC)
- 1:25 Generic Issues Program - Process and Screening Analysis, H. Vandermolen (NRC)
- 1:50 Operating Experience Implementation Task Force, T. Reis (NRC)
- 2:15 A Generalized Framework for Assessment of Safety Margins in Nuclear Power Plants, G. Lanik (NRC), J. Meyer (ISL)
- 2:40 Boric Acid Corrosion of Light Water Reactor Pressure Vessel Materials, J-H. Park, et al. (NRC)
- 3:15 Break