American Nuclear Society: 2007 Annual Meeting

June 24–28, 2007 • Boston, Massachusetts • Boston Marriott Copley

"It's All About the People: The Future of Nuclear"

and EMBEDDED TOPICAL MEETINGS:

- **Space Nuclear Conference 2007 (SNC'07)**
- **Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH2)**

(see last page for details)

SUMMARY DEADLINE: JANUARY 12, 2007

Call for Papers

Conference Chairs

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David P. Barry, *Shaw Stone and Webster Nuclear Services*

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Raymond Klann, *Argonne National Laboratory*

Assistant Techical Program Cochairs
Jess Gehin, *Oak Ridge National Laboratory*
Steve LaMont, *Los Alamos National Laboratory*

Track Themes

1. Meeting Theme—It's All About the People: The Future of Nuclear
2. Nuclear Power and New Construction of Nuclear Systems
3. Fuel Cycle, Waste Management, and Decommissioning Technologies
4. Nuclear Facility and Criticality Safety
5. Environmental Science and Technologies
6. Medical and Nonpower Applications of Radiation
7. Nuclear Science and Engineering
8. Advanced Energy Research and Emerging Technologies
9. Education, Training, and Communication with the Public
10. Nuclear Nonproliferation and Security
11. Professional Development

Deadlines—NO EXCEPTIONS

SUBMISSION OF SUMMARIES: *November 1, 2006–January 12, 2007*
AUTHOR NOTIFICATION OF ACCEPTANCE: *By February 28, 2007*
REVISED SUMMARIES DUE: *March 14, 2007*

Format

Authors are now REQUIRED to use the ANS Template and "Guidelines for TRANSACTIONS Summary Preparation" provided on the ANS Web site. Summaries must be submitted electronically using Adobe Acrobat (PDF) files and original Microsoft Word documents and the ANS Electronic Submission System. Summaries not based on the ANS Template will be REJECTED.

Guidelines for Summaries

Please submit summaries describing work that is NEW, SIGNIFICANT, and RELEVANT to the nuclear industry. ANS will publish all accepted summaries in the TRANSACTIONS. Papers are presented orally at the meeting, and presenters are expected to register for the meeting. Completed papers may be published elsewhere, but the summaries become the property of ANS. Under no circumstances should a summary or full paper be published in any other publication prior to presentation at the ANS meeting. It is the author's responsibility to protect classified or proprietary information.

Content

1. Introduction: State the purpose of the work.
2. Description of the actual work: Must be NEW and SIGNIFICANT.
3. Results: Discuss their significance.
4. References: If any, must be closely related published works. Minimize the number of references.
5. Do not present a bibliographical listing.

Length

1. Use at least 450 words, excluding tables and figures.
2. Use no more than 900 words, including tables and figures.
3. Count tables and figures as 150 words each. Use no more than three tables or figures.
4. Limit title to ten words; limit listing authors to three or fewer if possible.
5. Exclude references from word count.

Page Charge

ANS charges $100 per final printed page (prorated) in the TRANSACTIONS. Authors should be prepared to provide their purchase order numbers when submitting their summaries electronically.

REQUIRED Template and "Guidelines for TRANSACTIONS Summary Preparation":

www.ans.org/pubs/transactions

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Transactions Coordinator

Ellen Leitschuh
Tel: 708-579-8253
Fax: 708-352-6464
eleitschuh@ans.org

Information Services

Joe Koblich, Director
Tel: 708-579-8237
Fax: 708-352-6464
jkoblich@ans.org

ANS 2007 Annual Meeting: Session Titles for Contributed and Invited Sessions

(I) = Invited, (C) = Contributed, (I/C) = Invited/Contributed, (P) = Panel Sessions; (S) = Student Only; ( ) = Sponsoring Division, [ ] = Cosponsoring Division

Track 1. Meeting Theme—It's All About the People: The Future of Nuclear

1a. The Aging Plant/Aging-Changing Workforce (HFD) [ETD, OPD] (I/C)
1b. Young Member Challenges: Knowledge Transfer (YMG) [HFD, OPD] (P)
1c. The Softer Side of Human Factors: Managing the Contracted Workforce for Productivity and Plant Reliability (HFD) [OPD] (I/C)
1d. Young Member Challenges: Life Skills (YMG) [HFD] (P)
1e. Bringing Value to the American Nuclear Society (YMG) (P)

Track 2. Nuclear Power and New Construction of Nuclear Systems

2a. Creating Certainty in New Nuclear Plant Construction (OPD) (P)
2b. License Renewal Status and Progress (OPD) (I/C)
2c. New Plants, Lessons Learned from Intervenors (OPD) (I/C)
2d. Nuclear Power Plant Construction in China (OPD) (P)
2e. Environmental Aspects of New Site Selection (ESD) [OPD] (I/C)
2f. Process for Safety Reviews of Construction/Operating Licenses (NISD) [OPD] (P)
2g. Standardization for New ALWRs (OPD) (P)
2h. Gas Reactor Safety and Licensing (NISD) (P)
2i. Supply Chain and Infrastructure for the Next Generation of U.S. Nuclear Plants (OPD) (I/C)
2j. Human Factors Concepts and Considerations in New Plant Design (HFD) [OPD] (I/C)
2k. Regulation of Safety Culture (NISD) [HFD, OPD] (C)
2l. Updating the NRC's Standard Review Plan (NISD) [OPD] (C)
2m. Current Trends and Future Directions of Nuclear Power Plant Main Control Rooms (HFD) [OPD] (I/C)
2n. Control Room Habitability: Technical and Regulatory Lessons Learned (NISD) [HFD, OPD] (C)
2o. New Regulatory Approaches for Pressurized Thermal Shock Analysis and Licensing (NISD) [OPD, THD] (C)
2p. Thermal Hydraulics of Steam Generators (THD) [OPD] (I/C)

Track 3. Fuel Cycle, Waste Management, and Decommissioning Technologies

3a. Economics of Closed Nuclear Fuel Cycles (FCWMD) [ESD] (I/C)
3b. The Potential for International Collaborations on Closed Fuel Cycle Demonstrations and Implementations (FCWMD) (P)
3c. Head End Improvements for Processing Spent Nuclear Fuels (FCWMD) (I/C)
3d. Environmental Aspects of Nuclear Fuel Reprocessing (ESD) [FCWMD] (C)
3e. Computational Methods for Fuel Cycle Simulations (MCD) [FCWMD, RPSD] (I/C)
3f. Economic Analysis of Fast Reactors (FCWMD) (ESD) (I/C)
3g. The Physics of Plutonium and MOX-Fueled Cores (RPD) (I/C)
3h. Improvements and Innovations in Spent Fuel Storage (OPD) [ESD, FCWMD] (I/C)
3i. Environmental Aspects of Spent Fuel Storage (ESD) [OPD] (I/C)
3j. International Session on Decommissioning, Decontamination, and Reutilization (DDRD) (P)
3k. Hot Topics and Emerging Issues in Decommissioning, Decontamination, and Reutilization (DDRD) (P)
3l. Current Issues in Environmental Restoration and Decommissioning (ESD) [DDRD] (C)
3m. Environmental Aspects of the Management of Low-Activity and Transuranic Radioactive Waste (ESD) (C)
3n. Environmental Aspects of Transportation of Radioactive Materials (ESD) [OPD] (C)
3o. Robotics and Remote Systems: General (RRSD) (C)
3p. Modeling and Simulation Capabilities Supporting Nuclear Non-Proliferation (FCWMD) (P)
3q. Application of Online Condition Monitoring Techniques for Nuclear Non-Proliferation (FCWMD) (C)

Track 4. Nuclear Facility and Criticality Safety

4a. Data, Analysis, and Operations for Nuclear Criticality Safety (NCSD) [OPD] (C)
4b. Implementation of 10 CFR 70, Subpart H, and 10 CFR 830, Subpart B (NCSD) (C)
4c Nuclear Criticality Safety Standards Forum (NCSD) (P)
4d. Practical Applications of NCS Control Parameter Implementation (NCSD) (C)
4e. Regulator and Licensee Views on Criticality Safety Issues (NCSD) (P)
4f. Student Research in Nuclear Criticality Safety (NCSD)(C)
4g. Changes to 10 CFR Part 52 (NISD) [ESD, OPD] (C)
4h. Emerging Topics in Nuclear Installation Safety Technology (NISD) (C)
4i. Fire Protection in Nuclear Installation Safety (NISD) (C)
4j. Modeling Safety Issues of Fuel Reprocessing (NISD) [FCWMD] (C)
4k. Probabilistic Safety Applications (NISD) [OPD] (C)
4l. Validation of Safety-Related Phenomenological Models (NISD) [THD] (C)
4m. Generic Safety Issue 191 - Update and Developments on Containment Sump Performance (OPD) [NISD, THD] (I/C)
4n. Radiation Exposure Events: Root Causes, Lessons Learned and Program Improvements (OPD) [HFD] (I/C)
4o. Nuclear Installation Safety: General (NISD) (C)
4p. Reactor Safety: General (NISD) [OPD] (C)

Track 5. Environmental Science and Technologies

5a. Climate Change: What Part Does Nuclear Energy Play? (OPD) [ESD] (P)
5b. Applications of Geographic Information Systems to Enhance Environmental Evaluations (ESD) (I/C)
5c. Biological Monitoring (ESD) [BMD] (C)
5d. Contributions of Nuclear Science and Technology to Sustainable Development (ESD) (P)
5e. Environmental Benefits of Sustainable Nuclear Energy (ESD) [OPD] (P)
5f. Environmental Monitoring at Nuclear Facilities: Monitoring Results and Advances in Techniques (ESD) [IRD] (C)
5g. Modeling the Transport of Radioactive and Hazardous Materials in the Environment (ESD) [RPSD] (C)
5h. Site Tritium Release and Ground Water Contamination (NISD) [ESD] (C)
5i. Environmental Sciences: General (ESD) (C)

Track 6. Medical and Nonpower Applications of Radiation

6a. Impact of INIE on University Research Reactors (IRD) (I/C)
6b. Nuclear Process Heat Applications (OPD) (I/C)
6c. Neutron Beam Techniques (IRD) (I/C)
6d. Medical Applications of University Research Reactors (IRD) [BMD] (I/C)
6e. Computational Challenges in Clinical Medical Physics (MCD) [BMD, RPSD] (I/C)
6f. Accelerator Applications: General (AAD) (C)
6g. Biology and Medicine: General (BMD) (C)
6h. Isotopes and Radiation: General (IRD) (C)

Track 7. Nuclear Science and Engineering

7a. Current Topics for Reactor Engineers (RPD) [OPD] (P)
7b. Current Issues in Computational Methods: Round Table (MCD) (P)
7c. New Perspectives on Validation and Verification for Reactor Physics Analysis (RPD) (C)
7d. Mathematical Modeling (MCD) (C)
7e. Numerical Approaches to Multiphysics Coupling in Nuclear Science and Engineering (MCD) [THD] (I/C)
7f. Real World Performance of Parallel Applications (MCD) (I/C)
7g. Sensitivity, Uncertainty, and Parameter Estimation Methodologies in Nuclear System Modeling (MCD) (I/C)
7h. Reactor Analysis Methods (RPD) [MCD] (I/C)
7i. Reactor Physics Design, Validation, and Operating Experience (RPD) [OPD] (I/C)
7j. Computational Resources for Radiation Modeling (RPSD) [MCD] (I/C)
7k. Computational Thermal Hydraulics (THD) [MCD] (I/C)
7l. Uncertainty Treatment in Nuclear Science and Engineering (THD) [NISD, OPD] (I/C)
7m. Development of Atomistic and Continuum Modeling Methods (MSTD) [MCD] (C)
7n. Fusion Energy: General (FED) (C)
7o. Computational Methods: General (MCD) (C)
7p. Reactor Physics: General (RPD) (C)
7q. Transport Methods: General (MCD) (C)
7r. Radiation Protection and Shielding: General (RPSD) (C)
7s. General Thermal Hydraulics (THD) (C)

ANS 2007 Annual Meeting: Session Titles for Contributed and Invited Sessions

Track 8. Advanced Energy Research and Emerging Technologies

8a. Environmental Aspects of the Next Generation Nuclear Plant (NGNP) (ESD) [OPD] (I/C)

8b. Environmental Impacts and External Costs of Energy Technologies (ESD) (C)

8c. Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations (FCWMD) [RPD] (I/C)

8d. Development of Conversion Processes and Remote Fuel Fabrication Capabilities for Transmutation Fuels (FCWMD) [MSTD] (I/C)

8e. Process Development for Advanced Fuel Cycle Applications (FCWMD) (I/C)

8f. Materials Compatibility and Degradation in Advanced Nuclear Systems (MSTD) [OPD] (C)

8g. Recycling of Transuranics in Advanced Fuel Cycle Systems (RPD) [FCWMD] (C)

8h. Thermal Hydraulics of Generation IV Systems (THD) (I/C)

8i. U.S. Department of Energy Nuclear Engineering Education Research (NEER) Highlights (YMG) [ETD, FED] (I)

Track 9. Education, Training, and Communication with the Public

9a. Education and Training: General (ETD) (C)

9b. Extended Conversations from the CONTI Conference (ETD) (P)

9c. Focus on Communications: Pronuclear Activism (ETD) [OPD] (P)

9d. Focus on Communications: Risk Communications (ETD) [OPD] (P)

9e. Focus on Communications: Speaking to the Media (ETD) [OPD] (P)

9f. Perspectives on Nuclear Engineering Education from Current Students and Recent Graduates (ETD) [OPD] (I/C)

9g. Research by U.S. Department of Energy Sponsored Students (ETD) [OPD] (C)

9h. Training, Human Performance, and Work Force Development (ETD) [HFD, OPD] (I/C)

Track 10. Nuclear Nonproliferation and Security

10a. Emergency Preparedness and Response (ESD) [OPD] (C)

10b. Environmental Aspects of Accidental Release and Malevolent Act Dispersion of Radioactive Materials (ESD) [OPD] (C)

10c. Environmental Aspects of Homeland Security (ESD) [OPD] (C)

10d. Current Status on Nonproliferation Programs (FCWMD) (P)

10e. Current Topics and Issues in Nuclear Nonproliferation Policy (FCWMD) (P)

10f. Detection Technologies for Homeland Security Applications (RPSD) [IRD] (C)

10g. Safety and Security of Radiation Sources (RPSD) [IRD, NISD] (C)

Track 11. Professional Development

11a. Monte Carlo Burnup/Transmutation Tutorial (RPSD) (P)

11b. Monte Carlo Tutorial (RPSD) (P)

11c. Industry Quality Methods (YMG) [NCSD, OPD] (P)

ANS 2007 Annual Meeting: Technical Divisions

Accelerator Applications (AAD)
Session 6f
Itacil Gomes, icgomes@att.net

Biology and Medicine (BMD)
Session 6g
William D. James, wd-james@tamu.edu

Decommissioning, Decontamination, and Reutilization (DDRD)
Sessions 3j, 3k
John W. Bowen, johnwbowen@comcast.net

Education and Training (ETD)
Sessions 9a, 9b, 9c, 9d, 9e, 9f, 9g, 9h
Mike Robinson, robinsma@capslock.net

Environmental Sciences (ESD)
Sessions 2e, 3d, 3i, 3l, 3m, 3n, 5b, 5c, 5d, 5e, 5f, 5g, 5i, 8a, 8b, 10a, 10b, 10c
Rebecca L. Steinman, rls@adventengineering.com

Fuel Cycle and Waste Management (FCWMD)
Sessions 3a, 3b, 3c, 3f, 3p, 3q, 8c, 8d, 8e, 10d, 10e
Terry Todd, terry.todd@inl.gov

Fusion Energy (FED)
Session 7n
James P. Blanchard, blanchard@engr.wisc.edu

Human Factors (HFD)
Session 1a, 1c, 2j, 2m
Mark G. Friedmann, mark.friedmann@dayzim.com

Isotopes and Radiation (IRD)
Sessions 6a, 6c, 6d, 6h
Stephen LaMont, lamont@lanl.gov

Materials Science and Technology (MSTD)
Sessions 7m, 8f
Kenneth J. Geelhood, kenneth.geelhood@pnl.gov

Mathematics and Computation (MCD)
Sessions 3e, 6e, 7b, 7d, 7e, 7f, 7g, 7o, 7q
Dmitriy Anistratov, anistratov@ncsu.edu

Nuclear Criticality Safety (NCSD)
Sessions 4a, 4b, 4c, 4d, 4e, 4f
Lane S. Paschal, lpaschal@comcast.net

Nuclear Installations Safety (NISD)
Sessions 2f, 2h, 2k, 2l, 2n, 2o, 4g, 4h, 4i, 4j, 4k, 4l, 4o, 4p, 5h
Dana A. Powers, dapower@sandia.gov

Operations and Power (OPD)
Sessions 2a, 2b, 2c, 2d, 2g, 2i, 3h, 4m, 4n, 5a, 6b
Thomas A. Remick, remickta@songs.sce.com

Radiation Protection and Shielding (RPSD)
Sessions 7j, 7r, 10f, 10g, 11a, 11b
John Hendricks, jxh@lanl.gov

Reactor Physics (RPD)
Sessions 3g, 7a, 7c, 7h, 7i, 7p, 8g
Ivan Maldonado, ivan.maldonado@uc.edu

Robotics and Remote Systems (RRSD)
Session 3o
Carl D. Crane, ccrane@ufl.edu

Thermal Hydraulics (THD)
Sessions 2p, 7k, 7l, 7s, 8h
A. Kurshad Muftuoglu, muftuoak@westinghouse.com

Aerospace Nuclear Science and Technology Technical Working Group (ANST)
Thomas K. Larson, tkl@inel.gov

Young Members Group (YMG)
Sessions 1b, 1d, 1e, 8i, 11c
A. Nichole Ellis, ellisan@westinghouse.com

EMBEDDED TOPICAL MEETING: Space Nuclear Conference 2007 (SNC '07)

June 24–28, 2007 • Boston, Massachusetts • Boston Marriott Copley

EMBEDDED TOPICAL MEETING CHAIRS

General Chairs

Charles Chitwood, *Marshall Space Flight Center*
John J. Grossenbacher (Ret.), *Idaho National Laboratory*

Technical Program Chairs

Shannon Bragg-Sitton, *Los Alamos National Laboratory*
Steven D. Howe, *Idaho National Laboratory Center for Space Nuclear Research*

PAPER DEADLINES

ABSTRACTS DUE:	*December 1, 2006*
DRAFT PAPERS DUE:	*February 1, 2007*
FINAL PAPERS DUE:	*April 15, 2007*

SUBMIT SUMMARIES

Please submit your summaries at www.ans.org/goto/space07
E-mail: space@ans.org

ABOUT THE MEETING

Space Nuclear Conference 2007 (SNC '07) will be the second topical meeting organized by the Aerospace Nuclear Science and Technology technical group. NASA funding has been established to develop capabilities for unmanned and manned missions to the moon, Mars, and beyond. Strategies implementing nuclear-based power and propulsion technology, as well as radiation shielding protection, will be an integral part of successful missions of these types.

The purpose of the meeting is to bring together and provide a communications network and forum for information exchange for the wide cross section of research and management personnel from government, industry, academia, and the national laboratory system that are involved in the initiative. To this end, the meeting will address topics ranging from overviews of current programs and plans to detailed issues related to space travel such as nuclear-based power and propulsion system design, materials, testing, safety, space environmental effects and nuclear power system radiation shielding for humans and electronic components, and human factor strategies for the safe and reliable operation of nuclear power and propulsion plants.

This conference will have full-length technical papers, which will be peer reviewed and published on a CD-ROM, available at the meeting.

PLENARY SESSIONS

- Space Nuclear Power & Propulsion
- Radioisotope Power Sources
- Key Issues & Challenges
- Future Opportunities

TOPICS

- Mission Design for Manned & Unmanned Space Exploration
- Planetary (Moon, Mars) Surface Power Strategy & Design
- Concepts for Advanced Space Systems: Space Power & Propulsion & Surface Power Systems
- Power Conversion Design & Integration & Spacecraft Power Strategies
- Application of Nuclear Thermal Propulsion to Vision for Space Exploration Missions
- Core Neutronic Design & Analysis
- Nuclear Fuels Development
- Thermal Fluid Design Issues including: Thermal Fluid Physics, Computational Thermal Fluid Dynamics (CTFD), Zero-Gravity, Thermal Hydraulics
- Materials Assessments including: Requirements, Characterization, Structural Performance, Testing
- Dynamics, Instrumentation & Control, & Systems Engineering
- Component Development: Pumps, Radiators, Heat Exchangers, Electronics, & Cabling
- Radiation Shielding and Protection including: Environment Definition, Transport Modeling & Simulation, Integration of Shielding Strategies with Power & Structure Designs, & Dose & Risk Analysis
- Component Testing & Validation including: Validation of Behavior at Temperature & Over Lifetime
- Ground Testing of Full-Scale Systems
- In Situ Resource Utilization for Surface Bases including Power & Energy Requirements
- Systems Modeling & Simulation
- Human Interactions with Surface Power Systems including: Deployment, Operations, & Maintenance
- Space Nuclear Power Safety including: Software Quality Assurance (SQA) Testing, Benchmarks for Nuclear Analysis Software & Data, Materials & Systems Degradation Benchmarks, & Lessons Learned
- Public and Stakeholder Interests Related to the Space Nuclear Program
- Space Nuclear Education

EMBEDDED TOPICAL MEETING:

Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH2)

June 24–28, 2007 • Boston, Massachusetts • Boston Marriott Copley

EMBEDDED TOPICAL MEETING CHAIRS

General Chair

Carl J. Sink, *U.S. Dept. of Energy, Nuclear Hydrogen Initiative*

Honorary Chair

Paul Kruger, *Stanford University*

Technical Program Chair

Kevin R. O'Kula, *Washington Safety Management Solutions*

PAPER DEADLINES

450-900 WORD ABSTRACTS DUE:	*January 12, 2007*
NOTIFICATION OF AUTHORS:	*January 26, 2007*
FULL PAPERS DUE:	*March 15, 2007*

SUBMIT SUMMARIES

Please submit work that is NEW, SIGNIFICANT, and RELEVANT to the objectives of ST-NH2. Summaries and Full Papers must be submitted electronically. Authors are REQUIRED to use the ANS Template and "Guidelines" for Summary and Full Paper submissions provided at http://www.ans.org/pubs.

ABOUT THE MEETING

The ST-NH2 Topical is sponsored by the Nuclear Installations Safety Division with the Fuel Cycle and Waste Management, Thermal Hydraulics, and Environmental Sciences Divisions as cosponsoring divisions. Because hydrogen is a common link, safety and technology themes will be highlighted in the both nuclear production and control, as well as in the nuclear waste processing and management areas. This embedded meeting will provide unique opportunities to report on research & development, safety, program planning, and regulatory professionals for discussing progress, status, experience, and near-term goals in hydrogen production, control and management based on nuclear systems. Panel, traditional, and poster sessions are planned to highlight programs, accomplishments, and challenges in both the international and domestic areas. Distinguished papers from ST–NH2 will be planned for publication in an ANS journal.

TOPICS

1. Nuclear Production Technology Programs: Status & Progress
   U. S. Program; Pacific Rim Programs; European Programs; Research Reactor Programs
2. Nuclear Technology Development: Status & Progress
   High-Temperature Electrolysis; Thermochemical Cycles; Hybrid Cycles; Steam Reforming; Fusion-Based & Advanced System Production; Integrated & Co-Generation Systems; Balance of Plant
3. Safety Aspects of Nuclear Production of Hydrogen
   Reactor Safety Issues; Ex-Reactor & Balance of Plant; Transport & Infrastructure
4. Systems & Risk Studies
   Nuclear Production of Hydrogen; Control & Management of Hydrogen
5. Environmental Aspects of Nuclear-Based Hydrogen Production
6. Socioeconomic Perspectives
7. Computer Code Development for Safety & Process Optimization
   Analytical Software Development; Process Control & Programmable Logic Software; Experience with New Generation Software; Software Quality Assurance
8. Hydrogen Control in Nuclear Power Plants
   Operating Experience; Mitigation & Prevention
9. Materials Issues - Applied Research & Development
   Production; Storage; Operating Plants; Test Design, Protocol, & Quality Assurance
10. Waste Processing & Storage Safety
    Hydrogen Control in Waste Processing Facilities; TRU Waste Drum Management; Worker Safety Issues
11. Regulatory Perspectives & Safety Culture
    Risk-Informing Paradigms; Chemical Industry Lessons Learned; IAEA, DOE, OSHA, EPA, & Perspectives
12. Emerging Topics