



ANS National Meeting

2013 Winter Meeting and Technology Expo



Preliminary Program



November 10-14, 2013
Omni Shoreham Hotel

Program Highlights

- ★ 75 Years of Fission
- ★ Storm the Hill
- ★ Non-Proliferation: Future Vision
- ★ The SMR Wave
- ★ Technical Risk Management

REGISTER TODAY @ ANS.ORG

75 YEARS
NUCLEAR
FISSION





ANS Conference

2013 Winter Meeting & Technology Expo

The 75th Anniversary of the Discovery of Nuclear Fission

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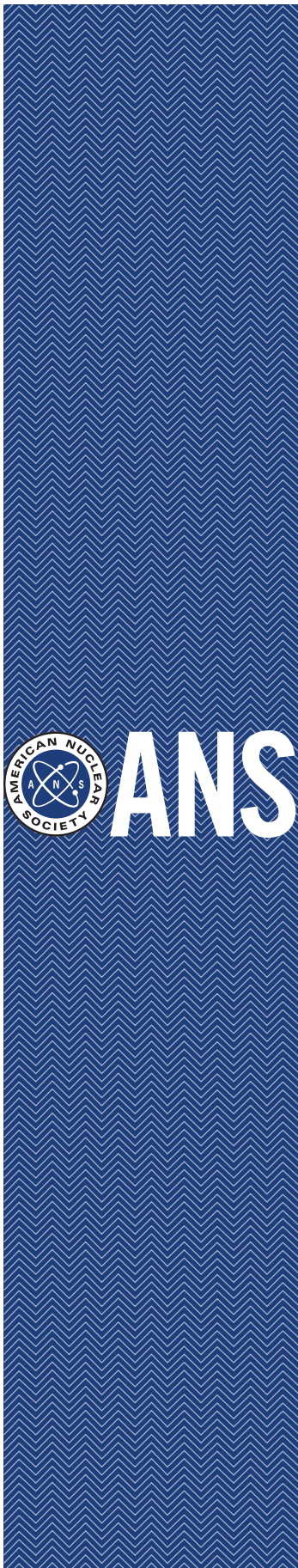
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GENERAL MEETING INFORMATION

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Revised 9/23/2013

MEETING HIGHLIGHTS

SATURDAY, NOVEMBER 9, 2013

8:00 a.m. - 5:00 p.m. Workshop for Science Educators
 8:30 a.m. - 6:30 p.m. Young Professionals Congress 2013
 2:00 p.m. - 5:00 p.m. Meeting Registration

SUNDAY, NOVEMBER 10, 2013

11:00 a.m. - 7:00 p.m. Meeting Registration
 1:00 p.m. - 1:30 p.m. First-Time Attendee Orientation
 4:00 p.m. - 5:00 p.m. Student Assistant Training Session
 5:00 p.m. - 6:00 p.m. Mentoring Program
 6:00 p.m. - 7:30 p.m. ANS President's Reception
 6:00 p.m. - 7:30 p.m. ANS Nuclear Technology EXPO

MONDAY, NOVEMBER 11, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration
 8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality
 8:00 a.m. - 11:30 a.m. 2013 ANS Winter Meeting:
 Opening Plenary Session:
 The 75th Anniversary of the
 Discovery of Nuclear Fission
 11:30 a.m. - 1:00 p.m. Attendee Luncheon in the
 Technology EXPO
 11:30 a.m. - 6:00 p.m. ANS Technology EXPO
 1:00 p.m. - 3:00 p.m. ANS President's Special Session
 3:00 p.m. - 6:30 p.m. 2013 ANS Winter Meeting:
 Technical Sessions
 6:30 p.m. - 8:30 p.m. Evening Event: Dinner Celebrating
 75 Years of Nuclear Fission

TUESDAY, NOVEMBER 12, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration
 8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality
 8:00 a.m. - 11:45 a.m. 2013 ANS Winter Meeting:
 Technical Sessions
 8:00 a.m. - 11:45 a.m. Risk Management: Opening
 Plenary Session: Risk-Informed
 Decision Making
 8:00 a.m. - 11:30 a.m. SMR: Plenary I: Meeting Overview
 and General Topics
 8:00 a.m. - 11:30 a.m. Nuclear Nonproliferation: Opening
 Plenary: First Fission to the Future:
 A Reflection and Projection on
 Nuclear Nonproliferation
 10:00 a.m. - 2:00 p.m. ANS Technology EXPO
 1:00 p.m. - 9:00 p.m. 2013 ANS Winter Meeting:
 Technical Sessions
 1:00 p.m. - 6:00 p.m. Embedded Topical:
 Risk Management
 1:00 p.m. - 6:00 p.m. Embedded Topical: SMR
 1:00 p.m. - 6:00 p.m. Embedded Topical:
 Nuclear Nonproliferation

4:30 p.m. - 6:30 p.m.

TPC Special Session:
 Environmental Considerations
 in Long-Term Energy Policy,
 Including the Role of Nuclear
 Energy and its Contribution to
 Reducing Green-House Gas
 Emissions

WEDNESDAY, NOVEMBER 13, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration
 8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality
 8:00 a.m. - 11:45 a.m. 2013 ANS Winter Meeting:
 Technical Sessions
 8:00 a.m. - 11:30 a.m. Embedded Topical:
 Risk Management
 8:00 a.m. - 11:30 a.m. SMR: Plenary II: SMR iPWR
 Owner-Operator Nth of a
 Kind Vision
 8:00 a.m. - 11:30 a.m. Embedded Topical:
 Nuclear Nonproliferation
 1:00 p.m. - 6:30 p.m. 2013 ANS Winter Meeting:
 Technical Sessions
 1:00 p.m. - 7:00 p.m. Embedded Topical:
 Risk Management
 1:00 p.m. - 7:30 p.m. Embedded Topical: SMR
 1:00 p.m. - 4:30 p.m. Embedded Topical:
 Nuclear Nonproliferation
 4:00 p.m. - 5:00 p.m. Capitol Hill Visit Pre-briefing
 5:00 p.m. - 6:00 p.m. Policy and Communications
 Workshop
 7:00 p.m. - 10:00 p.m. Evening Event: Dinner and Tour
 at Mount Vernon Estate

THURSDAY, NOVEMBER 14, 2013

7:30 a.m. - 2:00 p.m. Meeting Registration
 8:00 a.m. - 11:45 p.m. 2013 ANS Winter Meeting:
 Technical Sessions
 8:00 a.m. - 11:30 a.m. Embedded Topical:
 Risk Management
 8:00 a.m. - 11:30 a.m. Embedded Topical: SMR
 8:00 a.m. - 11:30 a.m. Embedded Topical:
 Nuclear Nonproliferation
 1:00 p.m. - 5:00 p.m. 2013 ANS Winter Meeting:
 Technical Sessions
 1:00 p.m. - 4:30 p.m. Embedded Topical:
 Risk Management
 1:00 p.m. - 4:30 p.m. Embedded Topical: SMR
 1:00 p.m. - 4:30 p.m. Embedded Topical:
 Nuclear Nonproliferation
 8:00 A.m. - 3:30 p.m. Technical Tour: An Afternoon
 on the NSS Savannah

2013 ANS Winter Meeting

"The 75th Anniversary of the Discovery of Nuclear Fission"



GENERAL CHAIR:
James Rogers
Duke Energy



ASSISTANT GENERAL CHAIR:
Steven P. Nesbit
Duke Energy



ASSISTANT GENERAL CHAIR:
James W. Behrens
US Navy - Retired



TECHNICAL PROGRAM CHAIR:
Linda H. Hansen
Argonne National Laboratory



ASSISTANT PROGRAM CHAIR:
James J. Byrne
Byrne & Associates LLC



ASSISTANT PROGRAM CHAIR:
Patrick J. Pinhero
University of Missouri/Columbia



ASSISTANT PROGRAM CHAIR:
Martin Sattison
Idaho National Laboratory

STUDENT PROGRAM CHAIR:
Robert M. Bryant
University of Maryland, College Park



SPECIAL EVENTS CHAIR:
Suzanne K. Schroer
U.S. Nuclear Regulatory Commission



TECHNICAL TOURS CHAIR:
Charles R. Martin
Defense Nuclear Facilities Safety Board



MEDIA CHAIR:
Mimi H. Limbach
Potomac Communications Group

TEACHER WORKSHOP CHAIR:
Mike Cullingford

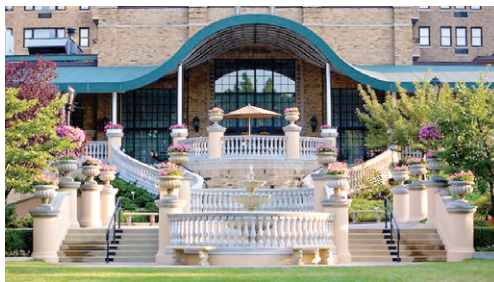
MEETING INFORMATION

Meeting Information

The 2013 ANS Winter Meeting and four Embedded Topical Meetings: Risk Management for Complex Socio-Technical Systems [RM4CSS], 2nd ANS SMR 2013 Conference, Nuclear Nonproliferation - First Fission to the Future, and Young Professionals Congress 2013 will be held November 10-14, 2013, in Washington, DC.

Accommodations/Hotel Information

The Omni Shoreham Hotel, located at 2500 Calvert Street NW, Washington, DC 20008, is the host hotel for the 2013 ANS Winter Meeting, where all meeting activities, technical sessions and embedded topical meetings will take place.



The special room rate for the meeting is: \$269.00/night (single/double rate).

Reservations can be made on their website at: <http://www.omnihotels.com/ANS2013Winter> To make hotel reservations by phone, call 800-545-8700. The ANS group code is: 12400611857.

Attendees must identify themselves as part of the American Nuclear Society to receive the group rate.

The deadline to make hotel reservations is Friday, October 18, 2013 (5:00 PM Eastern).

Message to Attendees:

ANS has made every effort to secure the best possible nightly room rate for you at the Omni Shoreham Hotel. That rate results from a negotiated overall package of event needs such as sleeping rooms, meeting room space and other requirements. Event costs will increase if ANS falls short of its minimum room block guarantee.

Please help ANS keep the costs of this event as low as possible by booking your housing needs at the designated host hotel and through the reservation process created by ANS. Reserving your rooms elsewhere means you are booking outside the contracted room block, jeopardizing ANS' ability to meet its contracted obligations and to keep registration fees to a minimum. ANS

appreciates your support and understanding of this important issue. Thank you!

ANS Nuclear Technology EXPO

The ANS Nuclear Technology EXPO will be held in conjunction with the 2013 ANS Winter Meeting in the Exhibit Hall of the hotel. Please turn to page 67 for additional information.

First-Time Attendee Orientation

The ANS Membership Committee will offer an orientation session for first-time ANS meeting attendees. Learn what goes on at national meetings, how the national organization works, and how to get involved at the national and local levels.

Whether you are a member or not, student or professional, if this is your first ANS national meeting, the Membership Committee invites you to attend this session, which will be held 1:00 - 1:30 p.m. on Sunday, November 10, 2013.

Student Program

Attendance at the 2013 ANS Winter Meeting is an exciting professional opportunity for college and graduate students.

More information on the new Student Program will be available soon.

ANS Conference Office

Mon., Nov. 11, through Thurs., Nov. 14, 2013
8:00 a.m. - 5:00 p.m.

ANS Member Business Office

Mon., Nov. 11, through Thurs., Nov. 14, 2013
8:00 a.m. - 5:00 p.m.

ANS Media Center

Monday, November 11, 2013
7:45 a.m. - 4:00 p.m.
Tuesday, November 12, 2013
8:00 a.m. - 4:00 p.m.
Wednesday, November 13, 2013
8:00 a.m. - 4:00 p.m.

Conference Registration

Registration is required for all attendees and presenters. Badges are required for admission to all events.

- The Full Conference Registration Fee includes admission to all technical sessions, the President's Reception, the Attendee Luncheon and the conference proceedings (CD-Rom).
- The Student Registration Fee includes

admission to all technical sessions, the President's Reception, the Attendee Luncheon and the conference proceedings (CD-Rom). A full-time student i.d. is required.

ANS REGISTRATION

Meeting registration, speakers' & sessions chairs' desk and the message desk will be located at the West Registration Desk of the Omni Shoreham Hotel, Sunday, November 10, 2013 - Thursday, November 14, 2013. Meeting registration is required for all attendees and presenters. Name badges are required for admission to all technical sessions and events.

REGISTRATION HOURS:

Saturday, November 9, 2013
2:00 p.m. - 5:00 p.m.
Sunday, November 10, 2013
11:00 a.m. - 7:00 p.m.
Monday, November 11, 2013
7:30 a.m. - 5:00 p.m.
Tuesday, November 12, 2013
7:30 a.m. - 5:00 p.m.
Wednesday, November 13, 2013
7:30 a.m. - 5:00 p.m.
Thursday, November 14, 2013
7:30 a.m. - 2:00 p.m.

Spouse/Guest Hospitality

Spouse/guest hospitality breakfast will be served from 8:00 a.m. - 10:00 a.m., Monday, November 11, 2013, through Wednesday, November 13, 2013. Continental breakfast will be served each morning.

Spouse/guest registration is required for admittance to the spouse/guest hospitality breakfast.

Spouse/guest registration includes one ticket to the President's Reception and admittance to the spouse/guest breakfast only - it does not include technical sessions or other events.

Speaker Registration

All speakers are required to register for the conference in advance and to submit a registration fee. Speakers and session chairs are requested to check-in at the speakers' desk, located in the ANS Registration area at least one day prior to their presentation. A speaker ready room will be available.

Mentoring Program

A special mentoring program will be held from 5:00 p.m. - 6:00 p.m. on Sunday, November 10, 2013.

ANS Members who serve as mentors hold a variety of positions within the Society, serving on governance committees and working within the divisions. The mentors encompass a wide range of careers and technical specialties, all of which they hope to share with first-time attendees, student members, new members and those seeking career advancement and networking opportunities.

Workshop for Science Educators

A workshop for science educators will be held on Saturday, November 9, 2013, 8:00 a.m. - 5:00 p.m.

You must contact Chuck Vincent, ANS Outreach Department, at 708-579-8311 for further details. Advance registration is required. This workshop is supported by individual organizational contributions to the American Nuclear Society's Outreach Program and by gifts from several professional divisions of ANS.

ANS President's Reception

Sunday, November 10, 2013
6:00 p.m. - 8:00 p.m.

One ticket to the ANS President's Reception is included in the full meeting registration fee. Additional tickets can be purchased in advance or on-site at the ANS Registration desk for \$85.00.

Attendee Luncheon in the EXPO

Monday, November 11, 2013
11:30 a.m. - 1:00 p.m.

One ticket to the Attendee Luncheon in the EXPO is included in the full meeting registration fee. Additional tickets can be purchased in advance or on-site at the ANS Registration desk for \$45.00.

Student Poster Session

Monday, November 11, 2013
11:30 a.m. - 1:00 p.m. and
3:30 p.m. - 5:00 p.m.

Dinner Celebrating 75 Years of Nuclear Fission

Monday, November 11, 2013
7:00 p.m. - 10:00 p.m.

Richard Rhodes is the author or editor of twenty-four books including *The Making of the Atomic Bomb*, which won a Pulitzer Prize in Nonfiction, a National Book Award and a National Book Critics Circle Award; *Dark Sun: The Making of the Hydrogen Bomb*, which was shortlisted for a Pulitzer Prize in History.

He has received numerous fellowships for research and writing, including grants from the Ford Foundation, the Guggenheim Foundation, the MacArthur Foundation Program in International Peace and Security and the Alfred P. Sloan Foundation.

Tickets can be purchased in advance or on-site at the ANS Registration desk for \$75.00.

ANS Communications Seminar

Wednesday, November 13th
Capitol Hill Visits Pre-briefing
4:00 p.m. - 5:00 p.m.

Policy and Communications Workshop

5:00 a.m. - 6:00 p.m.
Complimentary beer, wine and light snacks provided. *Sponsored by Babcock & Wilcox Corporation.*

Storm the Hill Day

Thursday, November 14, 2013
9:00 a.m. - 3:00 p.m.

Join your colleagues and visit Capitol Hill. All registered meeting attendees are welcome to participate. The meeting registration form includes a space to mark your intent to participate in the Capitol Hill visits. You must include your home ZIP code to be assigned to the correct team and to visit your local legislators.

Runners and Walkers: ANS Fun Run

On Tuesday, November 12, 2013, there will be a noncompetitive run starting at 6:00 a.m. from the lobby entrance of the hotel. We are looking forward to seeing you at the fun run in Washington, D.C. Bring shoes and a big smile.



Richard Rhodes

Dinner and Tour at Mount Vernon Estate

Wednesday, November 13, 2013
6:00 p.m. - 11:00 p.m. (includes travel time)

The evening includes cocktails, tour and dinner.

Step back in time to walk in George Washington's footsteps and enjoy lantern-lit lanes at Mount Vernon. Your evening includes a personalized candlelight tour of the Mansion



with stunning Potomac River views. Our expert guides will take you through all three floors of George Washington's beloved home, including the rarely-seen third floor.

Tickets can be purchased in advance or on-site at the ANS Registration desk for \$95.00.

Tour of the USS/NS Savannah

Thursday, November 14, 2013
1:00 p.m. - 5:00 p.m. (includes travel time) from the OMNI

Attendees will be transported by bus to the National Historic Landmark/ANS Nuclear Historic Landmark vessel N.S. Savannah. The world's first nuclear-powered merchant ship is maintained in protective storage in Baltimore



Pre-registration is encouraged, and attendees will be selected on a first-come basis. Bus departs the Omni at 1 p.m.; returns to the conference hotel approximately 5:00 p.m.

All ANS Winter Meeting Attendees are welcome to attend. We look forward to having you aboard.

Tickets can be purchased in advance or on-site at the ANS Registration desk for \$35.00.

WINTER MEETING TECHNICAL SESSIONS BY DIVISION

(Asterisks indicate special sessions. Parentheses indicate cosponsorship)

SPECIAL SESSIONS

*Opening Plenary: “The 75th Anniversary of the Discovery of Nuclear Fission,” Mon. a.m.

*ANS President’s Special Session, Mon. p.m.

*TPC Special Session: Environmental Considerations in Long-Term Energy Policy, Including the Role of Nuclear Energy and its Contribution to Reducing Green-House Gas Emissions, Tues. p.m.

ACCELERATOR APPLICATIONS (AAD)

Accelerator Applications: General, Wed. p.m.

AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY (ANSTD)

Aerospace Nuclear Science and Technology: General, Wed. a.m.

(Physics of Compact Reactors for Terrestrial and Space Applications), Thurs. p.m.

BIOLOGY AND MEDICINE (BMD)

Recent Developments in Radiation Source Use and Replacement After the NAS Report of 2008–Panel, Mon. p.m.

Biology and Medicine: General, Mon. p.m.

Stepping Stones in Neutron Activation Analysis and 75 Years of Nuclear Fission–Panel, Tues. a.m.

Application of Neutron Activation Analysis to Environmental Materials and Studies, Tues. a.m.

Investigations of Biological Trace Elements by Activation Analysis—Session Honoring A. Chatt, Tues. p.m.

Applications of Activation Analysis in Historical Research—Session Honoring J. M. Blackman, Wed. p.m.

Advanced Prompt Gamma Activation Analysis and Gamma Spectrometry, Thurs. a.m.

DECOMMISSIONING AND ENVIRONMENTAL SCIENCES (DESD)

Environmental Aspects of Fast Reactors with Integral Pyroprocessing of Used Nuclear Fuel–Panel, Tues. a.m.

Advances in Decontamination Technologies and Techniques–Panel, Tues. p.m.

Best of DD&R 2012–Panel, Tues. p.m.

Environmental Sciences: General, Wed. p.m.

Modeling and Transport of Radioactive Materials in the Environment, Wed. p.m.

Uranium Recovery and Reclamation, Thurs. a.m.

(U.S. Government Stewardship of Public Lands/Hosting of SMR/Energy Security Services –Panel; see SMR 2013 Meeting, page 55)

EDUCATION, TRAINING, AND WORKFORCE DEVELOPMENT (ETWDD)

Focus on Communications: Communicating with Policy Makers–Panel, Mon. p.m.

Focus on Communications: Meet the Media–Panel, Mon. p.m.

Student Design Competition, Mon. p.m.

Revisiting Accident-Proof Nuclear Energy After the Fukushima Accident–Panel, Mon. p.m.

University Program Accreditation 101–Panel, Mon. p.m.

The Importance of Professional Engineering Licensure in the Nuclear Industry–Panel, Mon. p.m.

Kent W. Hamlin Memorial Session—The Best of CONTE 2013–Panel, Tues. a.m.

The Innovations in Fuel Cycle Research Awards Program—A Student Competition, Tues. a.m.

Recent Developments in Nuclear Science and Engineering Education, Tues. p.m.

Implementation of Successful Nuclear Education Programs in the United States–Panel, Wed. p.m.

Enrollment Diversity and Nuclear Engineering–Panel, Wed. p.m.

Cutting Edge Techniques in Education, Training, and Distance Learning, Wed. p.m.

Research by U.S. DOE NEUP-Sponsored Students—I, Thurs. a.m.

Research by U.S. DOE NEUP-Sponsored Students—II, Thurs. p.m.

FUEL CYCLE AND WASTE MANAGEMENT (FCWMD)

Progress in DOE's Fuel Cycle Research and Development Program—Panel, Mon. p.m.

NRC Spent Fuel Transportation Risk Assessment—Panel, Tues. a.m.

Public Perception of Risk and Nuclear: Addressing the “Perception Gap”—Panel, Tues. p.m.

Nuclear Fuel Cycle Resources, Sustainability, Reuse and Recycle, Wed. a.m.

Fuel Cycle and Waste Management: General, Wed. p.m.

Advances in Aqueous Separation Methods and Waste Treatment, Wed. p.m.

FUSION ENERGY (FED)

U.S. Department of Energy—Light Water Reactor Sustainability (LWRS) Program, Mon. p.m.

(Shielding Problems for Fusion Devices), Tues. a.m.

HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS (HFICD)

A Brief History of Nuclear Plant Instrumentation and Controls—Panel, Mon. p.m.

Instrumentation and Controls for Nuclear Power Plants, Tues. a.m.

Nuclear Plant I&C Modernization, Wed. a.m.

Human Factors Engineering for Nuclear Plants, Wed. a.m.

ISOTOPES AND RADIATION (IRD)

Isotopes and Radiation: General, Mon. p.m.

(Nuclear Nonproliferation Technical Group: General), Mon. p.m.

(Stepping Stones in Neutron Activation Analysis and 75 Years of Nuclear Fission), Tues. a.m.

(Application of Neutron Activation Analysis to Environmental Materials and Studies), Tues. a.m.

(Investigations of Biological Trace Elements by Activation Analysis—Session Honoring A. Chatt), Tues. p.m.

(Applications of Activation Analysis in Historical Research—Session Honoring J. M. Blackman), Wed. p.m.

Developments and Applications of Neutron Beam Techniques, Wed. p.m.

Innovations in Radiation Detectors: New Designs, Improvements, and Applications, Wed. p.m.

(Advanced Prompt Gamma Activation Analysis and Gamma Spectrometry), Thurs. a.m.

MATERIALS SCIENCE AND TECHNOLOGY (MSTD)

Computational Modeling, Tues. a.m.

Fuel Cladding and Corrosion in Nuclear Systems, Tues. p.m.

Nuclear Fuel, Wed. p.m.

Reactor Systems and Advanced Measurement Techniques, Thurs. p.m.

MATHEMATICS AND COMPUTATION (MCD)

Current Issues in Computational Methods—Roundtable: Convergence—What Is It?, Mon. p.m.

Deterministic and Stochastic Methods for Eigenvalue Computations: A Retrospective and Prospective Look, Mon. p.m.

Transport Methods: General, Tues. a.m.

(Reactor Physics Analysis Methods—I), Tues. p.m.

Use of CAD in Nuclear Shielding and Criticality Codes, Tues. p.m.

Computational, Uncertainty Quantification, and Sensitivity Analysis Methods, Wed. a.m.

(Reactor Physics Analysis Methods—II), Wed. p.m.

(Nuclear Fission: 75-Year Anniversary—Panel), Wed. p.m.

Mathematical Modeling: General, Wed. p.m.

Transport, Computational, Uncertainty Quantification, and Sensitivity Analysis Methods, Thurs. a.m.

NUCLEAR CRITICALITY SAFETY (NCSD)

Data and Analysis in Nuclear Criticality Safety—I, Mon. p.m.

Data and Analysis in Nuclear Criticality Safety—II, Wed. a.m.

Data and Analysis in Nuclear Criticality Safety—III, Thurs. p.m.

FY2012 Recent Nuclear Criticality Safety Program Technical Accomplishments, Wed. p.m.

ANS 8 Standards Forum, Thurs. a.m.

WINTER MEETING TECHNICAL SESSIONS BY DIVISION

NUCLEAR INSTALLATIONS SAFETY (NISD)

Nuclear Installations Safety: General, Mon. p.m.

Modeling and Simulation, Tues. a.m.

PSA 2013 Highlights–Panel, Tues. p.m.

Research at the NRC, Wed. p.m.

NUCLEAR NONPROLIFERATION TECHNICAL GROUP (NNTG)

Nuclear Nonproliferation Technical Group: General, Mon. p.m.

OPERATIONS AND POWER (OPD)

Living Legends in Nuclear–Panel, Mon. p.m.

Codes and Standards Compliance for New Nuclear Plant Construction–Panel, Tues. a.m.

Current Assessment of Objectives and Outcomes of 10 CFR Part 52–Panel, Wed. p.m.

New Nuclear Construction Around the World—Status Report–Panel, Wed. a.m.

Operations and Power: General—I, Tues. p.m.

Operations and Power: General—II, Wed. p.m.

Advanced /Gen-IV Reactors—I, Thurs. a.m.

Advanced /Gen-IV Reactors—II, Thurs. p.m.

RADIATION PROTECTION AND SHIELDING (RPSD)

Radiation Protection and Shielding: General, Mon. p.m.

Radiation Protection and Shielding–Roundtable, Mon. p.m.

Shielding Problems for Fusion Devices, Tues. a.m.

Computational Tools for Radiation Protection and Shielding, Tues. p.m.

Illicit Trafficking Radiation Sensor Assessment Program (ITRAP 10) Highlights, Wed. a.m.

Best of ICRS/RPSD 2012, Wed. p.m.

Making Ethics Real in Nuclear Engineering–Panel, Thurs. p.m.

REACTOR PHYSICS (RPD)

Reactor Physics: General—I, Mon. p.m.

Reactor Physics: General—II, Tues. a.m.

Reactor Physics: General—III, Wed. p.m.

Reactor Physics Analysis Methods—I, Tues. p.m.

Reactor Physics Analysis Methods—II, Wed. p.m.

Lattice Physics Benchmarking, Tues. p.m.

Update on DOE IRP Project: Integral Inherently Safe Light Water Reactor (I2S-LWR)–Panel, Tues. p.m.

Advanced Modeling and Simulation in Reactor Physics, Wed. a.m.

Fuel Cycle Options: A Physics Perspective, Wed. a.m.

Nuclear Fission: 75-Year Anniversary–Panel, Wed. p.m.

Reactor Physics Design, Validation, and Operating Experience, Thurs. a.m.

Physics of Compact Reactors for Terrestrial and Space Applications, Thurs. p.m.

THERMAL HYDRAULICS (THD)

Experimental Thermal Hydraulics—I, Mon. p.m.

Dedicated in Memory of Dr. Chang H. Oh

Experimental Thermal Hydraulics—II, Tues. p.m.

Experimental Thermal Hydraulics—III, Thurs. a.m.

Computational Thermal Hydraulics—I, Tues. a.m.

Computational Thermal Hydraulics—II, Wed. a.m.

Computational Thermal Hydraulics—III, Wed. p.m.

Thermal Hydraulics: General—I, Tues. a.m.

Thermal Hydraulics: General—II, Thurs. p.m.

Highlights of NURETH-15–Panel, Tues. p.m.

Thermal-Hydraulics Code Verification and Validation—I, Tues. p.m.

Thermal-Hydraulics Code Verification and Validation—II, Tues. p.m.

Young Professional Thermal-Hydraulics Research Competition, Wed. a.m.

Thermal-Hydraulics Reactor Analyst 2.0–Panel, Wed. p.m.

General Two-Phase Flow, Wed. p.m.

YOUNG MEMBERS GROUP (YMG)

(Nuclear Nonproliferation Technical Group: General), Mon. p.m.

(Thermal-Hydraulics Reactor Analyst 2.0–Panel), Wed. p.m.

WINTER MEETING TECHNICAL SESSIONS BY DAY: MONDAY

MONDAY, NOVEMBER 11, 2013

- 7:30 a.m. - 5:00 p.m. Meeting Registration
8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality
8:00 a.m. - 11:30 a.m. 2013 ANS Winter Meeting
Opening Plenary
“The 75th Anniversary of the Discovery of Nuclear Fission”
11:00 a.m. - 1:00 p.m. Luncheon in the EXPO
1:00 p.m. - 3:00 p.m. ANS President’s Special Session
3:00 p.m. - 6:30 p.m. 2013 ANS Winter Meeting:
Technical Sessions
- Focus on Communications:
Communicating with Policy Makers—Panel
 - Focus on Communications: Meet the Media—Panel
 - A Brief History of Nuclear Plant Instrumentation and Controls—Panel
 - Current Issues in Computational Methods—Roundtable: Convergence — What Is It?
 - Deterministic and Stochastic Methods for Eigenvalue Computations: A Retrospective and Prospective Look
 - Living Legends in Nuclear—Panel
 - Progress in DOE’s Fuel Cycle Research and Development Program—Panel
 - Reactor Physics: General—I
 - Isotopes and Radiation: General
 - Recent Developments in Radiation Source Use and Replacement After the NAS Report of 2008—Panel
 - Biology and Medicine: General
 - Nuclear Installations Safety: General
 - Radiation Protection and Shielding: General
 - Radiation Protection and Shielding—Roundtable
 - U.S. Department of Energy—Light Water Reactor Sustainability (LWRS) Program
 - Student Design Competition
 - Revisiting Accident-Proof Nuclear Energy After the Fukushima Accident—Panel
 - University Program Accreditation 101—Panel
 - The Importance of Professional Engineering Licensure in the Nuclear Industry—Panel
 - Experimental Thermal Hydraulics—I Dedicated in Memory of Dr. Chang H. Oh
 - Data and Analysis in Nuclear Criticality Safety—I
 - Nuclear Nonproliferation Technical Group: General

MONDAY, NOVEMBER 11, 2013, 8:00 A.M.

OPENING PLENARY: “THE 75TH ANNIVERSARY OF THE DISCOVERY OF NUCLEAR FISSION.”

Session Organizer: James W. Behrens (US Navy, retired),
Steven P. Nesbit (Director, Nuclear Policy & Support, Duke Energy),
Dr. Eric Loewen (Past President, American Nuclear Society; GE Hitachi Nuclear Energy)
Chair: James E. Rogers (Chairman of the Board, Duke Energy)

SPEAKERS:

- James E. Rogers (Chairman of the Board, Duke Energy)
- The Honorable Ernest J. Moniz (Secretary of Energy; former Director of the Energy Initiative, Massachusetts Institute of Technology)
- The Honorable George P. Shultz (former Secretary of State; Distinguished Fellow, Hoover Institution)
- Dr. Sidney D. Drell (Professor Emeritus, Stanford Linear Accelerator Center; Senior Fellow, Stanford's Hoover Institution)
- The Honorable Samuel A. Nunn, Jr. (former United States Senator, State of Georgia; Co-Founder, Co-Chairman and Chief Executive Officer, Nuclear Threat Initiative)

MONDAY, NOVEMBER 11, 2013, 1:00 P.M.

ANS PRESIDENT’S SPECIAL SESSION: “ON THE PATH TO FISSION’S CENTENNIAL AND BEYOND”

Session Organizers: James W. Behrens (US Navy, retired),
Dr. Eric Loewen (Past President, American Nuclear Society; GE Hitachi Nuclear Energy)
Chair: Donald R. Hoffman (President, ANS)

SPEAKERS:

- Donald R. Hoffman (President, ANS)
- Dr. Ralph Cicerone (President, National Academy of Sciences)
- Dr. C. D. (Dan) Mote (President, National Academy of Engineering)
- The Honorable Allison M. Macfarlane (Chairman, Nuclear Regulatory Commission)
- The Honorable Peter B. Lyons (Assistant Secretary for Nuclear Energy, Department of Energy, Office of Nuclear Energy)
- Dr. John C. Browne (Director Emeritus, Los Alamos National Laboratory)
- Dr. Susan E. Eisenhower (Chairman Emeritus, Eisenhower Institute)

MONDAY, NOVEMBER 11, 2013, 3:00 P.M.

FOCUS ON COMMUNICATIONS: COMMUNICATING WITH POLICY MAKERS—PANEL

Sponsored by ETWDD

Session Organizer: Laura Hermann (Potomac Communications Group)

Policy decisions at the Federal and state level are vitally important for the entire energy industry. Consequently, communicating with policy makers clearly and frequently is an important element in

WINTER MEETING TECHNICAL SESSIONS BY DAY: MONDAY

the nuclear energy industry's communications efforts. And it is an element in which every ANS member can have a voice. This panel will address the various paths to successful communications about nuclear energy, science and technology with policy makers. This panel discussion includes professionals who are skilled and experienced in successfully communicating with policy makers at every level.

PANELISTS:

- Matt Bennett (*Third Way*)
- Michael L. Corradini (*Univ of Wisconsin*)
- Ron S. Faibish (*Senate Energy Committee*)
- Marshall Cohen (*Babcock & Wilcox*)

FOCUS ON COMMUNICATIONS: MEET THE MEDIA— PANEL

Sponsored by ETWDD

Session Organizer: Mimi H. Limbach (*Potomac Communications Group*)

The media is one of the major channels of communication that the nuclear energy industry has with the public. Today that media operates in many formats—print, broadcast, and digital among them. In addition, major journalists communicate through a variety of platforms that include the spectrum of social media. With deadlines looming every few hours, how can journalists understand the nuances of nuclear energy technology and science to accurately report on them? And, how can ANS members help them? Major journalists who cover the energy industry will share their perspectives about nuclear energy as well as those areas in which ANS members can help with their coverage of the industry and its news.

PANELISTS:

- Matt Wald (*The New York Times*)
- Elaine Hiruo (*Platts Nuclear Publications*)
- Chris Gadowski (*Bloomberg New Energy Finance*)

A BRIEF HISTORY OF NUCLEAR PLANT INSTRUMENTATION AND CONTROLS—PANEL

Sponsored by HFICD

Session Organizer: Sacit M. Cetiner (*ORNL*)

The instrumentation and control (I&C) systems in a nuclear power plant perform a function similar to the nervous system in human body. The history of nuclear I&C is as old as the first criticality. The very principles that guide the design and operation of I&C systems in modern nuclear power plants were also used in early critical piles. Though the “systems” were not as advanced, they were employed with the same safety philosophy that is engraved in NRC's general design criteria today, such as the diversity and defense-in-depth principles.

The Human Factors, Instrumentation and Controls Division (HFICD) organized this panel session in recognition of the 75th Anniversary of the Discovery of Fission to inform the ANS members and the meeting attendees in general about the incredible evolution of nuclear I&C systems—as well as the applicable standards and regulations that guide the design process—throughout its brief history.

PANELISTS:

- Syd J. Ball (*ORNL*)
- Hash M. Hashemian (*Analysis and Measurement Services Corp.*)
- Edward (Ted) Quinn (*Technology Resources*)
- Richard T. Wood (*ORNL*)
- NRC representative to be determined

CURRENT ISSUES IN COMPUTATIONAL METHODS— ROUNDTABLE: CONVERGENCE—WHAT IS IT?

Sponsored by MCD

Session Organizer: Forrest Brown (*LANL*)

Nearly all of our current computational methods for nuclear engineering rely on iterative solution methods, and nearly all of the descriptions of those methods focus on differencing schemes, physics accuracy, iteration methods, acceleration techniques, etc. All iterative methods share a common problem – when to declare success, stop the calculation, and report answers. Convergence of the calculations is a much-neglected topic, frequently treated in an ad hoc manner, but is critical to obtaining “correct” results.

For deterministic reactor calculations, there may be different stopping considerations for inner vs. outer iterations. For Monte Carlo calculations, there are distinct differences between convergence of the source distribution and statistical convergence. For CFD calculations, convergence for different length scales, time scales, and multiple state variables is a challenge. Combinations of high-order and low-order solution methods introduce convergence issues for each order and for the combination. Multiphysics calculations involve each of the previous issues as well as global convergence of coupled code iterations. On a different note, there are also convergence issues with problem modeling and accuracy: mesh convergence, scattering order, time-step sizes, number of fission products, design iterations, etc.

In this roundtable session, several experienced researchers will relate their views and experience on a number of topics involving convergence of nuclear engineering calculations. As with all Mathematics and Computation Roundtable sessions, the audience is highly encouraged to participate and relate their own experiences, opinions, and suggestions.

PANELISTS:

- Forrest Brown (*LANL*)
- Tim Kelley (*NCSU*)
- TBD

DETERMINISTIC AND STOCHASTIC METHODS FOR EIGENVALUE COMPUTATIONS: A RETROSPECTIVE AND PROSPECTIVE LOOK

Sponsored by MCD

Session Organizer: James S. Warsa (LANL)

E. Fermi's Work and the Early Development of the Concept of Criticality, Piero Ravetto (*Politecnico di Torino-Italy*)

Monte Carlo Criticality Calculations—History & Recent Progress, Forrest B. Brown (LANL), Sean E. Carney (*Univ of Michigan*), Brian C. Kiedrowski (LANL), William R. Martin (*Univ of Michigan*), invited Nonlinear Criticality Accelerations, H. Park, D. A. Knoll, C. K. Newman, J. A. Willert (LANL), C. T. Kelley (NCSU)

Computing the Alpha-Eigenvalue Using Nonlinear Solvers, Erin D. Fichtl, James S. Warsa (LANL)

LIVING LEGENDS IN NUCLEAR—PANEL

Sponsored by OPD

Session Organizer: Gale Hauck (*Westinghouse*)

The nuclear industry is unique compared to other energy industries in that many of its early development pioneers are still alive today. This session brings many of these living legends together to share their stories of early industry development and recognizes their contributions as part of the ANS celebration of the 75th anniversary of nuclear fission.

PANELISTS:

- Sam Cerni (*Retired, Westinghouse*)
- Vinny Esposito (*Retired, Westinghouse, 2013 ANS Congressional Fellow*)
- Other panelists to be determined

PROGRESS IN DOE'S FUEL CYCLE RESEARCH AND DEVELOPMENT PROGRAM—PANEL

Sponsored by FCWMD

Session Organizer: Andy Griffith (DOE)

The objective of this session is to disseminate information and stimulate discussion regarding recent research and development (R&D) progress in the U.S. Department of Energy's (DOE's) Fuel Cycle Research and Development (FCR&D) program. The session will consist of technical presentations provided by researchers in several technical areas of the FCR&D program. Talks will cover a broad range of subjects, including but not limited to, separation technologies, waste form development, innovative fuels, systems analysis, used fuel disposition, material protection and control, and modeling/simulation.

PANELISTS:

- Andy Gaunt (LANL)
- Kyle Brinkman (SRNL)
- Maria Okuniewski (INL)
- Kurt Terrani (ORNL)
- Ryan Winkler (LANL)
- Ben Cipiti (SNL)

REACTOR PHYSICS: GENERAL—I

Sponsored by RPD

Session Organizer: Alexander Stanculescu (INL)

Testing an Energy Dependent Albedo Capability for MCNP, Michael Lorne Fensin, John S. Hendricks, Alex McKinney (LANL)

McCARD Benchmark Calculations for the HTTR Experiments with ENDF/B-VII.0 and ENDF/B-VII.1, Chang Joon Jeong, Hyun Chul Lee, Tae Young Han, Jae man Noh (KAERI—Korea)

The Analysis of Tritium Production in the Solid Fuel Thorium Molten Salt Reactor (TMSR-SF₁), Xingwang Zhu, Zhaozhong He, Chao Peng (*Shanghai Institute of Applied Physics, Chinese Academy of Sciences*), Jiayu Zuo (*Nuclear and Radiation Safety Centre, Ministry of Environmental Protection of the People's Republic of China*), Kun Chen (*Shanghai Institute of Applied Physics, Chinese Academy of Sciences*)

Neutronic Effects of Nickel Ferrite CRUD Without Boron Hideout, Brandon LaFleur, Daniel Walter, Annalisa Manera (*Univ of Michigan*)

Important Fission Product Nuclides Identification Method for Simplified Burnup Chain Construction, Go Chiba, Masashi Tsuji, Tadashi Narabayashi (*Hokkaido Univ*), Yasunori Ohoka, Tadashi Ushio (*Nuclear Fuel Industries*)

Moderator Steam Bubble Control of Nuclear Reactors, Neal L. Mann (*Univ of Pittsburgh*)

Validation of OpenMC Reactor Physics Simulations with the B&W r8r0 Series Benchmarks, Jonathan A. Walsh, Benoit Forget, Kord S. Smith (MIT)

Evaluation of the Highest Multiplication Factor of the Subcritical Assembly, Edward S. Lum, Jay F. Kunze (*Idaho State Univ*)

ISOTOPES AND RADIATION: GENERAL

Sponsored by IRD

Session Organizer: Stephen P. LaMont (LANL)

Operational Effects of High Reactivity Irradiation Targets on a University Research Reactor, Brenden Heidrich, Andrew Bascom, Mark Trump (*Radiation Science and Engineering Center, The Pennsylvania State University*)

Future Cost of Isotopically-Separated Lithium for PWRs, Fluoride-Salt-Cooled High-Temperature Reactors (FHRs) and Lithium Batteries, Charles W. Forsberg (MIT)

WINTER MEETING TECHNICAL SESSIONS BY DAY: MONDAY

Discriminating Fission Weapons Using Lithium-Ion Batteries, Keith Holbert, Tyler Stannard, Taipeng Zhang, Anthony Christie (*Arizona State Univ*), Erik B. Johnson (*Radiation Monitoring Devices Inc*)
Encapsulation for Copper Production at the Penn State Breazeale Reactor, Andrew John Bascom (*Penn State*)

Experimental and Computational Study of Slow and Dense Granular Flow in a Pebble Bed Reactor, Vaibhav B. Khane, Muthanna H. Al-Dahhan (*Missouri Univ Sci Tech*)

Design Considerations for Neutron Moderators in Prompt Gamma Neutron Activation Analysis, Walid A. Metwally (*University of Sharjah*)

Effect of Interfacial Conductance on the Thermal Stresses in a Low-Enriched Uranium Foil Based Annular Target for the Production of Molybdenum-99, Srisharan Garg Govindarajan, Gary L. Solbrekken (*Univ of Missouri, Columbia*)

New Liquid Velocity Measurement Technique in Trickle Bed Reactors (TBRs) Using Combined Digital Radiography and Particle Tracking (DRPT) Techniques, Khairul Anuar Mohd Salleh, Hyoung Koo Lee, Muthanna H. Al Dahhan (*Missouri Univ Sci Tech*)

Automating X-Ray and Neutron Non-Destructive Testing Applications, Joseph Hashem, James Hunter (*LANL*), Mitch W. Pryor (*Univ of Texas, Austin*)

RECENT DEVELOPMENTS IN RADIATION SOURCE USE AND REPLACEMENT AFTER THE NAS REPORT OF 2008—PANEL

Sponsored by BMD

Session Organizer: Robin P. Gardner (*NCSU*)

Upon Congressional request, the National Research Council had conducted a study in 2008 to review the uses of high-risk radiation sources and the feasibility of replacing them with lower risk alternatives. The study concludes that the U.S. government should consider factors such as potential economic consequences of misuse of the radiation sources in its assessments of risk. The committee expressed specific concerns and offered a number of steps to minimize the overall risk. This panel will review these concerns and proposals and offer the latest status for discussion.

PANELISTS:

- Robin Gardner (*NCSU*)
- Stephen J. Wagner (*American Red Cross*)
- Medhat W. Mickael (*Weatherford*)
- Leonard W. Connell (*SNL*)
- Pingjun Guo (*Exxon Mobil Upstream Research Co.*)

BIOLOGY AND MEDICINE: GENERAL

Sponsored by BMD

Session Organizer: Rolf L. Zeisler (*NIST*)

The Effects of Smoking on Response of Osteoporosis Treatment Using Dual Energy X-ray Absorptiometry Scans, M. Al-Bogami (*William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Ma*), Mohammed Alkhorayef (*King Saud University*), O. A. Akanle, A. S. Jawad (*The Royal London Hospital*), R. A. Mageed (*William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Ma*), invited

A Highly Focused Small Animal Irradiator for Preclinical Trials of Low Energy Sources, Andrew Shepard, Tyler Fowler, Abby Besemer, Bryan P. Bednarz (*Univ of Wisconsin, Madison*)

Parametric Study of Assembly Process for Targets Carrying LEU Foils, Annemarie Hoyer, Sherif El-Gizawy, Brian Graybill, Gary L. Solbrekken (*Univ of Missouri, Columbia*)

NUCLEAR INSTALLATIONS SAFETY: GENERAL

Sponsored by NISD

Session Organizer: Matthew R. Denman (*SNL*)

Deep Borehole Disposal of Nuclear Waste, B. W. Arnold, Patrick Vane Brady, R. J. MacKinnon (*SNL*)

Source Term Evaluation for a Spent Fuel Reprocessing Facility, Nathan E. Bixler, David L. Louie, Fred Gelbard (*SNL*)

A Basic Principles Approach for Determining Radionuclide Aerosol Releases from Accidental Explosions in Reprocessing Facilities, Fred E. Gelbard, Alexander L. Brown, David L. Louie, Chengcheng Feng, Nathan E. Bixler (*SNL*)

Overview of LWR Severe Accident Research Activities at the Karlsruhe Institute of Technology, Alexei Miasoedov, Martin Steinbrueck, Walter Tromm (*KIT*)

Consequence Assessment Under Primary Cover Gas Leakage Accident for CLEAR-I, Qian Guo, Yican Wu (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

A Feasibility Study for Electronic SAMG, Sunhee Park, J. H. Kim, K. I. Ahn (*KAERI-Korea*)

A Risk-Informed Defense-in-Depth-Oriented Plant Design Approach for Mitigating Nuclear Accidents, Hidetsugu Morota (*MHI Nuclear Engineering Company, Ltd*), Takashi Sakihama, Hiroshi Sano (*MHI Nuclear Engineering Company, LTD*)

RADIATION PROTECTION AND SHIELDING: GENERAL

Sponsored by RPSD

Session Organizer: Peter F. Caracappa (*RPI*)

Preliminary Radioactive Source Term Analysis for Normal Operation of CLEAR-I, Tongqiang Dang, Yican Wu (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

Optimization of Thin Polymeric Films in Portal Monitors Using Genetic Algorithms, Matthew J. Urffer, A. Mabe, R. Uppal, D. Penumadu, L. F. Miller (*Univ of Tennessee*)

Effect of Radiation Propagation Time on Criticality Accident Alarm Response, Douglas M. Minnema (*DNFSB*)

Benchmark Improvements Pool Critical Assembly PV Problem Using the 3-D Sn PENTRAN, Christopher A. Edgar, Glenn E. Sjoden (*Georgia Tech*), invited

The Effects of Polystyrene Presence Neutron Detection: Mass Ratio, Height, and Distance Measurements, James N. Cantrell (*Univ of Tennessee*), Timothy E. Margrave (*ORNL*), Lawrence H. Heilbronn (*Univ of Tennessee, Knoxville*)

RADIATION PROTECTION AND SHIELDING— ROUNDTABLE

Sponsored by RPSD

Session Organizer: Peter F. Caracappa (*RPI*)

Everyone is invited to give a short presentation on any radiation protection and shielding topic of interest. Ten-minute time slots will be allotted on first-come/first-serve basis. This session is meant to be fast, informal, and fun.

U.S. DEPARTMENT OF ENERGY—LIGHT WATER REACTOR SUSTAINABILITY (LWRS) PROGRAM

Sponsored by FED

Session Organizer: Cindie Jensen (*INL*)

Crack Initiation Behavior of Neutron Irradiated Model and Commercial Stainless Steels in High Temperature Water, Kale J. Stephenson, Gary S. Was (*Univ of Michigan*), invited

Concrete Aging and Degradation in NPPs: LWRS Program R&D Progress Report, Igor Remec (*ORNL*), Kevin G. Field (*Univ of Wisconsin, Madison*), Thomas M. Rosseel, Jeremy T. Busby, Dan J. Haus (*ORNL*), invited

Applying The Results of LWRS Research in Hybrid Control Room Development, Matt Gibson (*Duke Energy*), Ronald L. Boring, Jacques V. Hugo (*INL*), invited

New Methods and Tools to Perform Safety Analysis Within RISMC, Diego Mandelli, Curtis L. Smith, Cristian Rabiti, Andrea Alfonsi, Joshua J. Cogliati, Robert A. Kinoshita (*INL*), invited

Station Blackout: A Case Study in the Interaction of Mechanistic and Probabilistic Safety Analysis, Curtis L. Smith, Diego Mandelli, Cristian Rabiti (*INL*), invited

Out-of-Pile Characterization and Testing of Joined Cylindrical Components for SiC-Based Nuclear Fuel Cladding, Hesham E. Khalifa, Christina A. Back, George M. Jacobsen, Oscar Gutierrez (*General Atomics*), invited

STUDENT DESIGN COMPETITION

Sponsored by ETWDD

Session Organizer: Travis W. Knight (*Univ of South Carolina*)

Student submittals are currently being evaluated, and the titles will be published in the final program.

REVISITING ACCIDENT-PROOF NUCLEAR ENERGY AFTER THE FUKUSHIMA ACCIDENT—PANEL

Sponsored by ETWDD

Session Organizer: Bulent Alpay (*GE Hitachi Nuclear*)

In this session, the panelists will discuss sharing the responsibilities of a nuclear accident as educators, regulatory bodies, and scientists in the view of current practices and challenges to establish accident-proof nuclear energy by minimizing the risk of nuclear accidents and developing novel design and operation techniques to make nuclear reactors accident-tolerant.

PANELISTS:

- John C. Lee (*Univ of Michigan*)
- Ronald A. Knief (*SNL*)
- Nathan Siu (*NRC*)
- Glen Watford (*GE Hitachi*)

UNIVERSITY PROGRAM ACCREDITATION IOI—PANEL

Sponsored by ETWDD

Session Organizer: Mary Lou Dunzik-Gougar (*Idaho State Univ*)

This session will provide an update on the criteria and processes used in accrediting university nuclear engineering programs. What is the role of ABET and the ANS? Did you know that program evaluators are identified, trained, and assigned to school visits by ANS' Accreditation Policies and Procedures Committee? Presenters, who are all experienced ABET evaluators, will answer these questions and provide their personal perspectives on "A Day in the Life of a NE Program Evaluator."

PANELISTS:

- Jason Harris (*Idaho State Univ*)
- Jane LeClair (*Excelsior College*)
- Michael Robinson (*Bechtel Marine Propulsion Corp.*)
- Youssef Shatilla (*Masdar Institute of Science and Technology, UAE*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: MONDAY

THE IMPORTANCE OF PROFESSIONAL ENGINEERING LICENSURE IN THE NUCLEAR INDUSTRY—PANEL

Sponsored by ETWDD

Session Organizer: John S. Bennion (*GE Hitachi Nuclear*)

Professional engineering registration and licensure laws have been enacted by all 50 states and 5 U.S. jurisdictions to safeguard life, health, and property, and promote the public welfare. Despite the undeniable and well-known benefits that nuclear power contributes to public welfare and economic development, perhaps no other field of engineering endeavor has the potential to profoundly impact public safety and property as can the nuclear power industry or the notoriety among antinuclear activists as being inimical to the common health and safety of the public and the environment. In this session, a distinguished panel of experts will provide personal insights from various legal, practical, commercial, and regulatory perspectives regarding the importance of professional engineering licensure in the nuclear enterprise and its role in promoting public confidence and acceptance of nuclear power generation.

PANELISTS:

- Arthur Schwartz (*National Society of Professional Engineers*)
- Steven Arndt (*NRC*)
- Rebecca Steinmann (*Tetra Tech, Inc.*)

EXPERIMENTAL THERMAL HYDRAULICS—I: DEDICATED IN MEMORY OF DR. CHANG H. OH

Sponsored by THD

Session Organizer: Seungjin Kim (*Penn State*)

Observation of Spacer Grid Effects During Dispersed Flow Film Boiling in a Rod Bundle, Michael Patrick Riley, Lokanath Mohanta, Fan-Bill Cheung (*Penn State*), Stephen M. Bajorek, Kirk Tien, Chris L. Hoxie (*NRC*)

Grid-Induced Heat Transfer Enhancement in Inverted Annular Film Boiling During Reflood, Lokanath Mohanta, Michael P. Riley, Fan-Bill Cheung (*Penn State*), Stephen M. Bajorek, Kirk Tien, Chris L. Hoxie (*NRC*)

Effect of Spacer Grid on Flow Regime Transition in a 1x3 Bundle Two-Phase Flow, Joshua Wheeler, Zachary Franiewski, Seungjin Kim (*Penn State*)

Experimental Study of Flow in a Rod Bundle with Spacer-Grids, Elvis Dominguez Ontiveros, Yassin A. Hassan (*Texas A&M*), Michael Conner (*Westinghouse*)

Critical Heat Flux for Downward Flow Boiling in a Vertical Narrow Rectangular Channel, Juhung Lee (*KAIST*), Daesung Jo, Heetaek Chae (*KAERI-Korea*), Soon Heung Chang (*KAIST*)

Critical Heat Flux on a Downward Facing Surface with a Shallow Cavity Obstruction, John Luxat (*McMaster Univ*)

“Technical Achievement Award Ceremony: This will immediately follow the technical session.”

DATA AND ANALYSIS IN NUCLEAR CRITICALITY SAFETY—I

Sponsored by NCSD

Session Organizer: Allison D. Miller (*SNL*)

Subcritical Sensitivity Measurements Using the Thor Core, Jesson D. Hutchinson, Avneet Sood, Mark Smith-Nelson (*LANL*)

Subcritical Measurements of Godiva Components, Jesson D. Hutchinson, Joetta Goda, Derek Dinwiddie, David Hayes, Mohini Rawool-Sullivan, John Bounds (*LANL*)

Subcriticality Measurement Technique Using Inherent Neutron Source in Uranium Fuel, Takeshi Shiozawa, Tomohiro Endo, Akio Yamamoto (*Nagoya Univ*), Cheolho Pyeon, Takahiro Yagi (*Kyoto Univ*)

Evaluating the 1969 Reevaluation of Jezebel, Jeffrey A. Favorite (*LANL*)

Development and Validation of a Nuclear Criticality Benchmark Capability in the Advanced Test Reactor Critical, Denis E. Beller (*UNLV*), John Darrell Bess (*Battelle Energy Alliance*), Fred Hua (*UNLV*)

The UNLV ATRC Criticality Benchmark Experiment Project, Denis E. Beller (*UNLV*), John Darrell Bess (*Battelle Energy Alliance*), Jeremiah Boles, Kimberly L. Clark (*UNLV*), Anthony Santo Domingo, Alexander Lui (*UNLV*), Jacob Mills, Lawrence J. Lakeotes (*Univ of Pittsburgh*), Benjamin Chase, J. Blair Briggs, Craig Jackson (*INL*), Fred Hua (*UNLV*)

NUCLEAR NONPROLIFERATION TECHNICAL GROUP: GENERAL

Sponsored by NNTG; cosponsored by IRD/YMG

Session Organizer: R. Chris Robinson (*Y-12 NSC*)

Fission Product γ -ray Measurements of ^{235}U and MCNP6 Predictions, M. T. Andrews, E. C. Corcoran, D. G. Kelly (*Royal Military College of Canada*), J. T. Goorley (*LANL*)

Sensitivity Analysis with PRAETOR for Diversion of Plutonium Self-Protected with Pu-238, Royal A. Elmore, Sunil Chirayath, William S. Charlton (*Texas A&M*)

On the Conversion of KUCA Type-A Cores from HEU to LEU Using U_{10}Mo Foils, Gerardo Aliberti (*ANL*)

Development of Opto Fluidics Lab on Chip Concept for Nuclear Materials Monitoring, Adrian E. Mendez Torres (*Savannah River National Laboratory*), Poh-Sang Lam (*SRNL*)

Summary of Modeling Studies in the High Reliability Safeguards Approach, Robert Angelo Borrelli (*Univ of California, Berkeley*)

Experimental Measurement of Uranium Hexafluoride Enrichment Using Fast Neutron Spectroscopy, Scott D. Kiff, Mark Gerling, Peter Marleau, Stanley Mrowka (*SNL*), Michael Streicher (*Univ of Michigan*)

Enabling International Fuel Leasing by the United States with Volunteer Industrial-Development Siting, Charles W. Forsberg (*MIT*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

TUESDAY, NOVEMBER 12, 2013

7:30 a.m. - 5:00 p.m. **Meeting Registration**

8:00 a.m. - 10:00 a.m. **Spouse/Guest Hospitality**

8:00 a.m. - 11:45 a.m. **2013 ANS Winter Meeting:
Technical Sessions**

- Environmental Aspects of Fast Reactors with Integral Pyroprocessing of Used Nuclear Fuel—Panel
- Reactor Physics: General—II
- Codes and Standards Compliance for New Nuclear Plant Construction—Panel
- NRC Spent Fuel Transportation Risk Assessment—Panel
- Transport Methods: General
- Instrumentation and Controls for Nuclear Power Plants
- Stepping Stones in Neutron Activation Analysis and 75 Years of Nuclear Fission—Panel
- Application of Neutron Activation Analysis to Environmental Materials and Studies
- Modeling and Simulation
- Shielding Problems for Fusion Devices
- Computational Modeling
- Computational Thermal Hydraulics—I
- Thermal Hydraulics: General—I
- Kent W. Hamlin Memorial Session—The Best of CONTE 2013—Panel
- The Innovations in Fuel Cycle Research Awards Program—A Student Competition

1:00 p.m. - 4:30 p.m. **2013 ANS Winter Meeting:
Technical Sessions**

- Recent Developments in Nuclear Science and Engineering Education
- Reactor Physics Analysis Methods—I
- Lattice Physics Benchmarking
- Operations and Power: General—I
- Public Perception of Risk and Nuclear: Addressing the “Perception Gap”—Panel
- Use of CAD in Nuclear Shielding and Criticality Codes
- Advances in Decontamination Technologies and Techniques—Panel
- Investigations of Biological Trace Elements by Activation Analysis—Session Honoring A. Chatt
- PSA 2013 Highlights—Panel
- Computational Tools for Radiation Protection and Shielding

TUESDAY, NOVEMBER 12, 2013

1:00 p.m. - 4:30 p.m. **2013 ANS Winter Meeting:
(cont.) Technical Sessions**

- Fuel Cladding and Corrosion in Nuclear Systems
- Highlights of NURETH-15—Panel
- Thermal-Hydraulics Code Verification and Validation—I

4:30 p.m. - 6:30 p.m. **TPC Special Session: Environmental Considerations in Long-Term Energy Policy, Including the Role of Nuclear Energy and its Contribution to Reducing Green-House Gas Emissions**

- Update on DOE IRP Project: Integral Inherently Safe Light Water Reactor (I2S-LWR)—Panel
- Best of DD&R 2012—Panel
- Thermal-Hydraulics Code Verification and Validation—II
- Experimental Thermal Hydraulics—II
- Flood Hazard Assessments and Flood Protection Issues following the Fukushima Daiichi Events—Panel

TUESDAY, NOVEMBER 12, 2013, 8:00 A.M.

ENVIRONMENTAL ASPECTS OF FAST REACTORS WITH INTEGRAL PYROPROCESSING OF USED NUCLEAR FUEL—PANEL

Sponsored by DESD

Session Organizer: Yoon Chang (ANL)

Fast Reactors with integral pyroprocessing of used nuclear fuel present a number of attractive environmental characteristics. This session is aimed at highlighting the most important points, including waste-volume reduction and elimination of long-lived radioactive isotopes from the waste stream, as well as some geopolitical aspects such as high proliferation resistance, reduction (or elimination) of enrichment requirements, elimination (or reduction) of mining requirements, and associated environmental impact.

PANELISTS:

- Yoon Chang (ANL)
- Eric Loewen (GEH)
- Sung Won Park (KAERI)
- Alexander Bychkov (IAEA)
- William Hannum (consultant)
- Steve Kirsch (author, “Why IFR now”)
- Andy Griffith (DOE)

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

REACTOR PHYSICS: GENERAL—II

Sponsored by RPD

Session Organizer: Alexander Stanculescu (INL)

Validation of WIMS/TRACE/PARCS Code System for Pressurized Water Reactors, Mohamed A. Elsayi [Khalifa University (KUSTAR)]

The Inexact Gauss Newton Method for Core Power Distribution Monitoring in Pressurized Water Reactors, Xingjie Peng (Tsinghua Univ)

A Least-Squares Method Based on Coupling Coefficients for Core Power Distribution Monitoring in Pressurized Water Reactors, Xingjie Peng (Tsinghua Univ)

Core Thermal-Hydraulics Analyses of the Molten Salt Fast Reactor (MSFR) in Nominal Conditions, Pablo R. Rubiolo, A. Laureau, E. Merle-Lucotte, M. Brovchenko, D. Heuer (LPSC-IN2P3-CNRS / UJF / Grenoble INP)

Control Assembly Modeling with the Nodal Equivalence Theory in Sodium-Cooled Fast Reactor, Woong Heo, Yonghee Kim (KAIST), Sang Ji Kim (KAERI-Korea)

Incorporation of Random Noise into Rossi-alpha Technique, Chidong Kong (Ulsan Natl Inst Sci Tech), Eunki Lee (Korea Hydraulic & Nuclear Power Corporation), Deokjung Lee (Ulsan Natl Inst Sci Tech)

3D Monte Carlo-Based Depletion of Control Rods for a Small PWR Core, Nicholas P. Luciano, Peter E. Collins, G. Ivan Maldonado (Univ of Tennessee)

Parametric Study to Capture the Skin Effect in PWR Control Rod Depletion, Peter E. Collins, Nicholas P. Luciano, G. Ivan Maldonado (Univ of Tennessee)

CODES AND STANDARDS COMPLIANCE FOR NEW NUCLEAR PLANT CONSTRUCTION-PANEL

Sponsored by OPD

Session Organizer: Peter J. Shaw (Westinghouse Electric Corp)

Codes and standards for the construction and operation of new nuclear plants have represented a consistent struggle for the industry. Many of these have been in long standing with industry experience backing the application of the items such as the ASME code. New codes are representing new challenges to the industry, as new technology is developed and applied in both new construction and operation, the codes and their interpretations must keep pace. The benefits of standardization and the international programs promoting standardization will be presented.

PANELISTS:

- Steven L. Stamm (Retired)
- Other panelists to be determined

NRC SPENT FUEL TRANSPORTATION RISK

ASSESSMENT-PANEL

Sponsored by FCWMD

Session Organizer: Ruth F. Weiner (SNL)

The panel will discuss the most recent assessment of risks of transporting used nuclear fuel. Radiological risks and consequences (doses) from both routine, incident-free transportation and transportation accidents will be discussed. The study to be discussed involved the use of actual certified casks. This is the first NUREG assessment since 1977. The study confirms that current NRC packaging regulations provide adequate protection of the public.

PANELISTS:

- Ruth Weiner (SNL)
- Douglas Ammerman (SNL)
- Carlos Lopez (SNL)
- John Cook (NRC)

TRANSPORT METHODS: GENERAL

Sponsored by MCD

Session Organizer: Brian C. Franke (SNL)

Monte Carlo Importances in the Presence of Space and Energy Self-Shielding, S. C. Wilson, R. N. Slaybaugh (Bechtel Marine Propulsion Corporation)

Improved Convergence Rates in Implicit Monte Carlo Simulations Through Stratified Sampling, Alex R. Long (Oregon State Univ), Ryan G. McClarren (Texas A&M)

Residual Monte Carlo with Discrete Scattering Angles in the 1-D Transport Equation, Brian C. Franke (SNL), Don E. Bruss, Jim E. Morel (Texas A&M)

Flux and Reaction Rate Kernel Density Estimators in OpenMC, Timothy P. Burke (Univ of Michigan), Brian C. Kiedrowski (LANL), William R. Martin (Univ of Michigan)

Bandwidth Sensitivity for Kernel Density Estimated Mesh Tallies, Kerry L. Dunn, Paul P. Wilson (Univ of Wisconsin, Madison)

MCNP5 vs. KDE: Direct Method for Mesh Tally Comparisons, Kerry L. Dunn, Paul P. Wilson (Univ of Wisconsin, Madison)

Stability Analysis of Burnup Calculations, Jeffery D. Densmore, Daniel F. Gill, David P. Griesheimer (BAPL)

2-D/3-D Coupling Between the Method of Characteristics and Discrete Ordinates, Mitchell T. Young, William Martin, Benjamin S. Collins (Univ of Michigan)

Application of Analytic Slowing-Down Kernel for MOC-MC Hybrid Method, Hyunsuk Lee, Deokjung Lee (UNIST)

INSTRUMENTATION AND CONTROLS FOR NUCLEAR POWER PLANTS

Sponsored by HFICD

Session Organizer: Sacit M. Cetiner (ORNL)

Accurate Uncertainty Quantification to Support Online Sensor Calibration Monitoring, Jamie B. Coble, Guang Lin (PNNL), Brent D. Shumaker (AMS), Hashem M. Hashemian (*Analysis and Measurement Services*), Pradeep Ramuhalli (PNNL)

Preliminary Development of Sensor for In Situ DNB Margin Measurement, Jordan L. Thompson, Thomas E. Diller, Alan A. Kornhauser (Virginia Tech)

EDF Experience and Criteria for Assignment of Automation Functions, Cecile Reboul-Salze, Francois Cheriaux (*EdF R&D*), Remy Delhomme, Alexander-John Wigg (*EDF SEPTEN*)

On Enhancing Risk Monitors for Advanced Small Modular Reactors, Jamie B. Coble, Garill Coles, Ryan M. Meyer, Pradeep Ramuhalli (PNNL)

Technical Needs for Prognostic Health Management of Passive Components in Advanced Small Modular Reactors, Ryan M. Meyer, Pradeep Ramuhalli (PNNL), Leonard J. Bond (*Iowa State Univ*), Jamie Baalis Coble, Evelyn H. Hirt (PNNL)

Instrumentation and Control Research for Small Modular Reactors, Hashem M. Hashemian (AMS)

Nuclear Process Vector Analysis Simulator, Kaylyn Marie McCoy, Tatjana Jevremovic (*Univ of Utah*)

Design of the Instrumentation and Control for the ITER Tokama Cooling System, Kofi Korsah, Bill De Van (ORNL), David Ashburn, Bradd Crofts, Steve Black, Michael Smith, Jerry Broadway (*AREVA Federal Services*)

Cyber Security of Nuclear Instrumentation and Control Systems: Overview of the IEC Standardization Activities, Leroy A Hardin (NRC), L. Pietre Cabacedes (*EDF, SEPTEN*), Edward L. Quinn (*Technology Resources*)

STEPPING STONES IN NEUTRON ACTIVATION ANALYSIS AND 75 YEARS OF NUCLEAR FISSION—PANEL

Sponsored by BMD; cosponsored by IRD

Session Organizer: Rolf L. Zeisler (NIST)

Georg Hevesy and Hilde Levi reported on the new method of activation analysis in 1936, before the nuclear fission of heavy elements was discovered in 1938 by Lise Meitner, Otto Hahn, Fritz Strassmann, and Otto Robert Frisch. However, the method of neutron activation analysis (NAA) was not used much before strong neutron sources became available, first reported in 1949 by Harrison Brown and Edward Goldberg using the neutron pile at the Argonne National Laboratory. In the 1950's NAA progressed with the increasing availability of research reactors; a particular milestone 55 years ago being the commissioning of the prototype for the TRIGA nuclear reactor (TRIGA Mark I) on May 3, 1958,

in San Diego. By the early 1960's, NAA was an accepted method for highly sensitive single and multi-element determinations in many applications. This panel reviews the growth of NAA and the corresponding efforts at NIST, which were paralleled with 50+ years of development and operation of its research reactor.

PANELISTS:

- Richard M. Lindstrom (NIST)
- James T. Tanner (FDA, retired)
- W. Dennis James (Texas A&M Univ)
- Robert R. Greenberg (NIST)

APPLICATION OF NEUTRON ACTIVATION ANALYSIS TO ENVIRONMENTAL MATERIALS AND STUDIES

Sponsored by BMD; cosponsored by IRD

Session Organizer: Kelly P. Grogan (NIST)

Analytical Applications of Delayed Neutron Activation Analysis, Kelly P. Grogan, Donna J. O'Kelly (NIST), invited

An Analytical Bias in European Legislation for Mercury in CFLs, Georg Steinhauser (*Colorado State Univ*), invited

The Role of Instrumental Neutron Activation for SI Traceability in the Determination of Perchlorate, Rabia Oflaz, Lee Yu (NIST), invited

Characterization of Italian Tile Samples Using Comparative Neutron Activation Analysis, Amanda M. Johnsen, Chad Durrant, Kenan Unlu (*Penn State*), invited

MODELING AND SIMULATION

Sponsored by NISD

Session Organizer: Tunc Aldemir (Ohio State)

VETA: Program for Severe Accident Source Term Calculations in CANDU, Vladimir Khotylev, A. Bujor (*Canadian Nucl Safety Comm*)

Simulation of Loss of Flow Accident in an Integral Pressurized Water Reactor by NK/TH coupling Approach, Salah-Ud-Din Khan (*King Saud Univ*), Minjun Peng (*Harbin Engineering Univ*)

Mitigation BDA with Ultimate Response Guideline Analysis of Lungmen ABWR using TRACE, Bo-Han Lee (*Natl Tsing Hua Univ*), Tsung-Sheng Feng (*National Tsing Hua Univ, Taiwan*), J. R. Wang (*Institute of Nuclear Energy Research, Taiwan*), Hwai-Pwu Chou (*Natl Tsing Hua Univ*)

Dynamic PRA: an Overview of New Algorithms to Generate, Analyze and Visualize Data, Diego Mandelli, Curtis L. Smith, Cristian Rabiti, Andrea Alfonsi, Robert W. Youngblood (INL), Valerio Pascucci, Bei Wang, Dan Maljovec (*Univ of Utah*), Peer-Timo Bremer (LLNL), Tunc Aldemir, Daniya Zamalieva, Alper Yilmaz (Ohio State)

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

An Assessment of Low Probability Containment Failure in a Long-Term Station Blackout Using Dynamic PRA, Acacia Brunett, Richard Denning, Tunc Aldemir (*Ohio State*)

Branch and Bound Algorithm Applied to Discrete Dynamic Event Trees, Joseph W. Nielsen (*BEA/INL*), Akira T. Tokuhito, Robert Hiromoto (*Univ of Idaho*)

Thresholding Strategies for Dynamic Event Tree Online Labeling with Hidden Markov Models, Daniya Zamalieva, Alper Yilmaz, Tunc Aldemir (*Ohio State*)

Nonlinear Time-Domain Seismic Response Modeling of NPPs Considering Soil-Structure Interactions, Abdollah Shafieezadeh, Jieun Hur (*Ohio State*)

SHIELDING PROBLEMS FOR FUSION DEVICES

Sponsored by RPSD; cosponsored by FED

Session Organizer: Arkady Serikov (*KIT*)

ITER Related Neutronics Calculations with ATTILA Computer Code, Subhash Puthanveetil Vasudevan (*ITER-india, Institute for Plasma Physics*), Russell E. Feder (*PPPL*), Shrichand Jakhar (*Inst Plasma Research*), Sajal Thomas (*ITER-india, Institute for Plasma Research*), Deepak Aggarwal (*Inst Plasma Research*)

Progressive Steps Towards Integral Nuclear Assessments for Fusion Devices, Laila A. El-Guebaly (*FTI*), invited

Neutronics Analysis of the ITER In-Vessel Viewing System, Andrew Turner (*CCFE*), Raul Pampin (*Fusion for Energy*)

The Status of US-ITER Diagnostic Port Plug Neutronics Analysis Using ATTILA, Russell Feder (*PPPL*), Mahmoud Z. Youssef (*UCLA*), Jonathan Klabacha (*PPPL*), invited

Neutronic Challenges for the Estimation of Shut-Down Dose Rates in ITER Ports, Arkady Serikov (*KIT*), Luciano Bertalot (*ITER Organization*), Ulrich Fischer (*KIT*), Sunil Pak, Alejandro Suarez (*ITER Organization*), Rosaria Villari (*Associazione EURATOM-ENEA sulla Fusione*)

Overview of Experimental Benchmarking of Shutdown Dose Rate Calculations in Fusion Devices, Rosaria Villari (*ENEA CR Frascati, UT FUS TECN*), Maurizio Angelone (*ENEA CR Frascati, UT FUS TECN*), Paola Batistoni (*EFDA - JET, Culham Science Centre*), Ulrich Fischer (*KIT-Euratom*), Luigino Petrizzi (*European Commission, DG Research & Innovation K5*), invited

Shielding Analysis for IFMIF Test Facility to Handle Activated Components, Keitaro Kondo, Ulrich Fischer, Arkady Serikov (*KIT*), invited

Development of Super Monte Carlo Calculation Program SuperMC 2.0, Yican Wu, Jing Song, FDS Team (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*), invited

Shielding for Gamma rays from Activated Water in ITER, Michael Loughlin (*ITER*), invited

Implementation, Benchmarking, and Application of R2S-ACT: an Open-Source, Mesh-Based, Rigorous 2-Step Activation Workflow, Elliott D. Biondo, Eric Relson, Andrew Davis, Paul P. H. Wilson (*Univ of Wisconsin, Madison*), invited

COMPUTATIONAL MODELING

Sponsored by MSTD

Session Organizer: Kenneth J. Geelhood (*PNNL*)

FAST: A Multidimensional Multiphysics Fuel Model Based on Commercial Finite-Element Software, Andrew Albert Prudil (*Royal Military College of Canada*), Brent Lewis (*Univ of Ontario Inst of Tech*), Paul Chan (*Royal Military College of Canada*)

Irradiation of Lithium-Intercalated Graphite to Produce Betavoltaic Batteries, Anthony Ross Pace, Patrick J. Pinhero (*Univ of Missouri, Columbia*), Alan Wertsching (*Univ of Idaho*), Matthew Bernards, Misty Sinclair (*Univ of Missouri, Columbia*)

Simulation of Fracture in Irradiated Iron Using Molecular Dynamics, Vijay Subramanian, Raman P. Singh (*Oklahoma State University*), Hongbing Lu (*University of Texas at Dallas*)

Constitutive Model Development for Alloy 617 Under High Temperature Multiaxial Loading, Shahriar Quayyum, Tasnim Hassan (*NCSU*)

Constitutive Modeling of High Temperature Uniaxial Responses of Alloy 617, Patrick Graham Pritchard (*NCSU*), Laura Carroll (*INL*), Tasnim Hassan (*NCSU*)

Experiment-Based Validation and Uncertainty Quantification of Coupled Multi-Scale Plasticity Models, Garrison Stevens, Sez Atamturktur (*Clemson Univ*), Ricardo Lebensohn (*LANL*)

COMPUTATIONAL THERMAL HYDRAULICS—I

Sponsored by THD

Session Organizer: Brian G. Woods (*Oregon State Univ*)

Comparison between CFD Analysis and Experimental Data for Flow in a 5×5 Rod Bundle with Spacer-Grids, Peng Yuan, Jin Yan, Yiban Xu, Zeses Karoutas (*Westinghouse*)

CFD Simulation of Fibrous Debris Blockage for a 4 Loop Westinghouse Plant, Yiban Xu, Jin Yan, Peng Yuan (*Westinghouse*), Robert Brewster (*CD-adapco*), Zeses Karoutas (*Westinghouse*)

Development of Advanced Analysis Tools for Interface Tracking Simulations, Jun Fang, Aaron M. Thomas, Igor A. Bolotnov (*NCSU*)

Interface Tracking Simulation of Air Bubble Growth and Detachment in a Water Domain, Stephen M. Palzewicz, Igor A. Bolotnov (*NCSU*)

Interface Tracking Study of Bubble/Wall Interaction, Sameer S. Vhora (*NCSU*), Silvina Cancelos (*University of Puerto Rico at Mayaguez*)

Simulation of Particle Behaviors in the Pipe Flow, Shin Kyu Kang, Yassin A. Hassan (*Texas A&M*)

Prediction of Pressure Drop and Heat Transfer Around Flow Obstructions, Brian M. Waite, Dillon R. Shaver (*RPI*), Michael Z. Podowski (*RPI*)

Multidimensional Modeling and Simulation of Supercritical CO₂ Compressor, Farhad Behafarid, Michael Z. Podowski (*RPI*)

A Lattice Boltzmann Method Based Thermal-Hydraulics Simulation Tool for Analyses of Nuclear Reactor Transients - PRATHAM, Emilian L. Popov, Prashant K. Jain, Abhijit S. Joshi (*ORNL*)

THERMAL HYDRAULICS: GENERAL—I

Sponsored by THD

Session Organizer: Elia Merzari (ANL)

Effect of Material and Additives on CHF for IVR-ERVC Strategy, Hae Min Park, Yong Hoon Jeong (KAIST)

Simple and Combined Cycle Power Conversion with Natural Gas Co-Firing, for Mobile PB-FHR, Charalampos Andreades, Per Peterson (Univ of California, Berkeley)

Accident Analysis of Fukushima Daiichi NPP Unit-1 by SAMPSON Code, Masanori Naitoh, Hiroaki Suzuki, Karin Hirakawa (The Institute of Applied Energy)

Melt Progression Analysis of TEPCO's Fukushima Daiichi Unit 3 by SAMPSON Code, Marco Pellegrini, Hideo Mizouchi, Hiroaki Suzuki, Masanori Naitoh (The Institute of Applied Energy)

Residual Heat Removal System Performance Estimation of DSFR with TRACE Code, Andong Shin, Yong Won Choi, Moo-Hoon Bae (KINS-Korea)

Validation of a MATLAB Code Developed for DRACS Thermal Performance Evaluation, Qiuping Lv, Inhun Kim, Xiaodong Sun, Richard Christensen, Thomas E. Blue (Ohio State), Graydon L. Yoder (ORNL), Dan W. Wilson (Univ of Pittsburgh), Piyush Sabharwall (INL)

Fluid-Structure Interactions of a Single Flexible Cylinder in Axial Flow, Oren Breslouer, Elias Balaras, Philippe M. Bardet (The George Washington University)

Generation of View Factors for RELAP5 Using MCNP, Huali Wu, Sunil Sunny Chirayath, Yassin A. Hassan (Texas A&M)

Feasibility Study of FAil-safe Simple Economical SMR (FASES) System, Ho Sik Kim, Hee Cheon No (KAIST)

Notes on Thermal-Hydraulics of Passive Systems, Alessandro Petruzzi (Nuclear Research Group San Piero a Grado), Francenco D'Auria, Marco Lanfredini (Univ of Pisa)

KENT W. HAMLIN MEMORIAL SESSION—THE BEST OF CONTE 2013—PANEL

Sponsored by ETWDD

Session Organizer: Jane A. LeClair (Excelsior Coll)

The Conference on Nuclear Training and Education (CONTE) is "An International Forum on Nuclear Training and Education and Workforce Issues Facing a Renewed Nuclear Energy Option." As the current workforce retires and the staffing needs emerge with new plant construction, training and qualification of a new workforce will be the critical path to meeting this vital. This session will present the best papers from CONTE 2013.

Filling the Critical Nuclear Quality System Workforce Gap, Robert Collins (Aiken Technical College)

The Gulf Nuclear Energy Infrastructure Institute, Alexander Solodov (Khalifa Univ)

Use of MELCOR in Monticello Simulator, Joseph Yarbrough (Xcel Energy)

New Nuclear Plants—Interactive 3D is the Most Effective Path to Mastery, Michael Lerg (GSE Systems, Inc.)

The Affective Domain in Nuclear Training, Audrey Cate (INPO)

THE INNOVATIONS IN FUEL CYCLE RESEARCH

AWARDS PROGRAM—A STUDENT COMPETITION

Sponsored by ETWDD

Session Organizer: Cathy S. Dixon (West Texas A & M Univ)

Hot Wire Needle Probe for In-Reactor Thermal Conductivity Measurement, Joshua Earl Daw, Joy L. Rempe, Darrell Knudson (INL)

Neptunium Sorption on Graphite Under Potential Environmental Conditions, Corey Christopher Keith, Gary Cerefice, Rebecca Springs, Milena Kalagorgevich (UNLV)

Adaptive Femtosecond Laser-Induced Breakdown Spectroscopy of Uranium, Phyllis Ko, Kyle Hartig, Jessica McNutt, Randall Schur, Timothy Jacomb-Hood, Igor Jovanovic (Penn State)

Direct Dissolution and Electrochemical Study of Cerium in Ionic Liquid, Janelle E. Droessler, John Kinyanjui, Beatriz Martinez, David Hatchett, Ken Czerwinski (UNLV)

A Nonlinear Ultrasonic Technique for Radiation Damage Characterization in RPV Steel, Kathryn H. Matlack, Jin-Yeon Kim (Georgia Tech), James J. Wall (EPRI), Jianmin Qu (Northwestern Univ), Laurence J. Jacobs (Georgia Tech)

U.S. CSB Reports and Safety Measures for Nuclear Chemical Facilities, Lyndsey Morgan Fyffe, James H. Clarke, Steven L. Krahn (Vanderbilt Univ), James Hutton (DOE)

TUESDAY, NOVEMBER 12, 2013, 1:00 P.M.

RECENT DEVELOPMENTS IN NUCLEAR SCIENCE AND ENGINEERING EDUCATION,

Sponsored by ETWDD

Session Organizer: John S. Bennion (GE Hitachi Nuclear)

Development of the UNLV Graduate Education Program in Nuclear Criticality Safety Engineering, Denis E. Beller, Charlotta E. Sanders, Fred Hua (UNLV)

The Nuclear Education and Training Program at University of California Irvine, Mikael Nilsson, George E. Miller, Athan J. Shaka (Univ of California, Irvine)

Curriculum Development on Nuclear Reactor Instrumentation and Controls (I&C), Belle R. Upadhyaya (Univ of Tennessee), Alireza Haghighat (Virginia Tech), Clayton A. Atchley (Univ of Tennessee), Nathan J. Roskoff (Virginia Tech)

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

Workforce Development for Government Research, Development, Testing and Evaluation Programs, Thomas J. Rosener (*Tasc, Inc.*), Dexter Simmons (*Defense Threat Reduction Agency*)

Developing a Successful Online Nuclear Engineer Technology Degree, Adrian M. Skinner (*Excelsior Coll*)

Nuclear Industry Meets National Cybersecurity Challenges, Jane A. LeClair, Adrian Skinner, Sherly Abraham (*Excelsior Coll*)

The Science of Nuclear Materials: Developing Technical Literacy Among Nuclear Policy Professionals at The George Washington University, Christopher L. Cahill, Gerald Feldman, William J. Briscoe, Douglas B. Shaw (*George Washington Univ*)

The “Pass the Torch” Nuclear Technology Library, Peggy R. Caserto (*Univ of Pittsburgh*)

REACTOR PHYSICS ANALYSIS METHODS—I,

Sponsored by RPD; cosponsored by MCD

Session Organizer: Mark D. DeHart (*INL*)

Behavior of Higher Order Fission Source Distribution in Monte-Carlo Calculations, Akio Yamamoto, Kotaro Sakata, Tomohiro Endo (*Nagoya Univ*)

Uncertainty and Correlation Estimation of Reload Safety Parameters of PWR Using Random Sampling Method, Tomoaki Watanabe, Tomohiro Endo, Akio Yamamoto (*Nagoya Univ*), Yasuhiro Kodama (*Nuclear Fuel Industries Ltd.*), Yasunori Ohoka (*Kumatori Works, Nuclear Fuel Ind.*), Tadashi Ushio (*Nuclear Fuel Industries Ltd*)

Development of Research on the Boundary Flow Response Method, Zhihong Liu, Zhaoyuan Liu, Jing Zhao (*Tsinghua Univ*)

Verification of the CANDUCS-DEFENS Code System Through the CANDU Initial Core Calculation, Eun Hyun Ryu, Yong Mann Song, Joo Hwan Park (*KAERI-Korea*)

Implementation of Perturbation Based Monte Carlo Criticality Search in RMC, Zeguang Li, Kan Wang, Jing Kang Deng (*Tsinghua Univ*)

A Method for Detector Response De-Convolution When Using Feynman’s Variance-To-Mean Technique, William L. Myers, Sheila G. Melton (*LANL*)

LATTICE PHYSICS BENCHMARKING

Sponsored by RPD

Session Organizer: Matthew A. Jessee (*ORNL*)

VERA Benchmark Calculations Using the SCALE-Polaris Lattice Physics Code, Matthew A. Jessee, William A. Wieselquist, Mark L. Williams, Kang Seog Kim (*ORNL*)

Benchmark Experiments in Water-Moderated Fully-Reflected 6.90% Enriched UO₂ Fuel Rod Lattices with a Fuel-to-Water Volume Ratio of 0.52, Gary A. Harms, Allison D. Miller, John T. Ford (*SNL*)

OPERATIONS AND POWER: GENERAL—I

Sponsored by OPD

Session Organizer: Belle R. Upadhyaya (*Univ of Tennessee*)

A Study on an Applicability of the MHR-50/100is for a General Industrial Use as a Hydrogen Production Source, Isao Minatsuki, Yorikata Mizokami (*Mitsubishi Heavy Industries, Ltd.*)

Fiberoptics-Based Sensing for Real-Time 3D In-Core Monitoring in NGNP/VHTR Environments, Pavel V. Tsvetkov (*Texas A&M*)

Performance Evaluation of Boronometer Based on MCNPX Model, Hyunsuk Lee (*UNIST*), Si Hwan Kim (*Hanyang University*), Seko Jean Lyou (*Users Inc.*), Deokjung Lee (*UNIST*)

Improving Fuel Assemblies with Axial Relocation, Nicholas Wilson, Zachariah Taylor Koyn, Andrew Kriha, Benjamin Horstman, Cassandra Lanceri, Alexandra Rader (*Purdue Univ*), invited

Integrated Life Cycle Management: A Degradation-Based Approach to Calculate the Likelihood of Failure of a Component or a Structure, Thomas C. Esselman (*Lucius Pitkin Inc*), Paul Bruck, Srikanth Cherukuri (*Lucius Pitkin, Inc.*), Charles Mengers (*EPRI*)

Maximizing the US Nuclear Fleet with Mega Upgrades - Projecting Concrete Lifetimes, Jacob D. DeWitte (*MIT*)

Numerical Investigation of a Supercritical CO₂ Centrifugal Compressor, Seong Gu Kim, Jekyoung Lee, Yoonhan Ahn, Jeong Ik Lee (*KAIST*), Yacine Addad (*Khalifa University of Science, Technology & Research*), Bockseong Ko (*SAMJIN Industrial CO., Ltd.*)

PUBLIC PERCEPTION OF RISK AND NUCLEAR: ADDRESSING THE “PERCEPTION GAP”—PANEL

Sponsored by FCWMD

Session Organizer: Steve E. Skutnik (*Univ of Tennessee*)

The difference between actual risk and how risks are perceived by the public is common to many aspects of everyday life, creating what experts term the “perception gap.” Such a gap is well-known to exist with respect to public perception of nuclear technologies. What can nuclear professionals do to narrow this perception gap with the public between real and perceived risks? This panel of experts will discuss the root of the nuclear perception gap, including looking at the factors that drive perceived risk, best practices by industry, and ways in which nuclear professionals can better communicate with the public.

PANELISTS:

- David Ropeik (*Ropeik & Assoc*)
- John Mueller (*The Ohio State Univ*)
- Margaret Harding (*4Factor Consulting*)
- Dan Kahan (*Yale Univ*)
- Andy Karam (*NYPD*)
- Jean Goodwin (*Iowa State Univ*)
- Leonard Greenberger (*Potomac Communications Group*)

USE OF CAD IN NUCLEAR SHIELDING AND CRITICALITY CODES

Sponsored by MCD

Session Organizer: Paul Hulse (*Sellafield Ltd*)

Meteor, a CAD-Based Criticality Code, Keith Searson (*Sellafield Ltd.*), Fabrice Fleutor (*Sellafield Ltd*), David Dewar, Robert Black (*Sellafield Ltd.*)

FluDAG and Other Implementations of the DAGMC Toolkit, Paul Wilson, Andrew Davis, Julie Zachman, Kerry L. Dunn (*Univ of Wisconsin, Madison*)

Comparison Between Unstructured Mesh Capabilities of DAGMCNP and MCNP6, Chelsea A. D'Angelo, Paul P. Wilson, Andrew Davis (*Univ of Wisconsin, Madison*)

On The Benefits of Mesh Partnerships: Attila - MCNP6 Integration, Ian M. Davis (*Transpire, Inc.*), Roger Martz (*LANL*)

MCAM 5.2: Advanced Interface Program for Multiple Nuclear Analysis Codes, Shengpeng Yu, Yican Wu, FDS Team (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

Extended and Improved Capabilities of the CAD to MC Geometry Conversion Tool McCad, Lei Lu, Ulrich Fischer, Pavel Pereslavytsev (*Institute for Neutron Physics and Reactor Technology, Karlsruhe Institute for Technology*), invited

Applications of the McCad Geometry Conversion Tool in Fusion Technology—ITER, IFMIF and DEMO, Ulrich Fischer, Grosse Dennis, Lu Lei, Kondo Keitaro, Pereslavytsev Pavel, Serikov Arkady, Vielhaber Steffen (*KIT*)

GEOMIT: CAD Based MCNP Automatic Conversion Code, Hesham Ramadan Aly Nasif, Hidetsugu Morota, Akahiro Masui (*MHI Nuclear Engineering Company Limited*), Noha Shaaban (*The Egyptian Nuclear and Radiological Authority*), Chikara Konno, Satoshi Sato (*JAEA-Japan*)

ADVANCES IN DECONTAMINATION TECHNOLOGIES AND TECHNIQUES—PANEL

Sponsored by DESD

Session Organizer: Douglas A. Davis (*NA*)

Significant progress has been made in the field of D&D utilizing advanced technologies and techniques that reduce cost, schedule, the amount of waste generated, and exposure to workers and the public. This panel will discuss improved characterization, planning, and waste minimization techniques, and will highlight technologies utilizing remote handling and decontamination methodologies to advance D&D.

PANELISTS:

- Andy Lombardo (*Perma-Fix Environmental Services*)
Advanced Characterization Technologies to Support D&D
- Jeff Bradford (*UCOR*)
Waste Minimization Techniques at Large Department of Energy Weapons Facilities D&D Projects
- Laurie Judd (*NuVision Engineering*)
Remote Handling Techniques Utilized in Decommissioning Projects in the U.S. and Abroad
- Richard Grondin (*Perma-Fix Environmental Services*)
Decontamination and Recycle of Precious Metals from Nuclear Power Plants

INVESTIGATIONS OF BIOLOGICAL TRACE ELEMENTS BY ACTIVATION ANALYSIS—SESSION HONORING A. CHATT

Sponsored by BMD; cosponsored by IRD

Session Organizer: Rolf L. Zeisler (*NIST*)

Total and Species-Specific Elemental Analysis by Neutron Activation, Amares Chatt (*Dalhousie Univ*), invited

Determination of Mercury by RNAA in Sectioned Hair Samples of Tycho Brahe: He Was Not Murdered by Mercury, Jan Kucera, Jan Kamenik, Vladimir Havranek (*Nuclear Physics Institute ASCR, Czech Republic*), invited

Neutron Activation Analysis of Japanese Green Tea for Trace Elements, Michiko Fukushima (*Ishinomaki Senshu University*), invited

Developing Tomato Reference Materials for Food Safety Analysis, Elisabete A. De Nadai Fernandes, Marcio Arruda Bacchi, Gabriel Adrian Sarries (*Univ of Sao Paulo*), invited

Uncovering Errors in NAA Measurements Using Internal Consistency Checks, Robert R. Greenberg, Richard M. Lindstrom (*NIST*), invited

Applications of INAA for Arsenic and Iodine in FDA Regulated Products, David L. Anderson, Sean D. Conklin (*US FDA*), invited

Arsenic Speciation in Candidate Fish Tissue Reference Materials, Rolf L. Zeisler (*NIST*), Vivian M. O. Carioni (*Universidade Federal do ABC, Centro de Ciencias Naturais e Humanas, Santo Andre-SP, Brazil*), Cassiana S. Nomura (*Universidade de Sao Paulo, Instituto de Quimica, Sao Paulo-SP, Brazil*), Lee L. Yu (*National Institute of Standards and Technology, Materials Measurement Laboratory*), invited

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

PSA 2013 HIGHLIGHTS-PANEL

Sponsored by NISD

Session Organizer: Kevin R. O’Kula (*URS Professional Solutions LLC*)

This is a panel session with highlights from the International Topical Meeting on Probabilistic Safety Assessment and Analysis, September 22-26, 2013 in Columbia, South Carolina (PSA 2013).

COMPUTATIONAL TOOLS FOR RADIATION PROTECTION AND SHIELDING

Sponsored by RPSD

Session Organizer: Michael Lorne Fensin (*LANL*)

Transport Modeling of High-Energy Neutron Transversal Through Tissue Equivalent Medium, Suresh Aghara, Joseph Grice (*Univ of Massachusetts*), Honglu Wu (*NASA Johnson Space Center*)

A Geant4 Implementation of a Novel Single-Event Monte Carlo Method for Electron Dose Calculations, David A. Dixon, Anil Prinja (*Univ of New Mexico*), Brian Franke (*Sandia National Labs*)

MCNP6 Cosmic & Terrestrial Background Particle Fluxes-Release 3, Gregg W. McKinney, Trevor Wilcox (*LANL*)

How to Use the MCNP6 Background Source Capability, Michael Lorne Fensin, Gregg W. McKinney (*LANL*)

Monte Carlo, Hybrid and Deterministic Calculations for the Activation Neutronics of the Swiss LWRs, Manuel Pantelias [*Swiss National Cooperative for the Disposal of Radioactive Waste (Nagra)*], Scott Mosher (*ORNL*)

Sourceless Efficiency Calibration for HPGe Detector Based on Medical Images, Chaobin Chen, Yican Wu (*Institute of Nuclear Energy Safety Technology, CAS FDS Team*)

PyNE Progress Report, Anthony Micaheal Scopatz (*Univ of Chicago*), Elliott D. Biondo (*Univ of Wisconsin-Madison*), Carsten Brachem (*Technische Universität Dresden*), John Xia (*Univ of Chicago*), Paul P. Wilson (*Univ of Wisconsin, Madison*)

FUEL CLADDING AND CORROSION IN NUCLEAR SYSTEMS

Sponsored by MSTD

Session Organizer: Kenneth J. Geelhood (*PNNL*)

Tensile Strength of Tubular SiC-SiC Composites for Use in Nuclear Cladding, George M. Jacobsen, H. E. Khalifa, C. A. Back (*General Atomics*)

Precipitate Characterization in Two ODS Steels Using Synchrotron XRD of Consolidated Samples and Cu-K α XRD of Precipitate Extractions, Djamel Kaoumi, Julianne Goddard (*Univ of South Carolina*)

Effect of Neutron Irradiation on Select MAX Phases, Darin Joseph

Tallman (*Drexel Univ*), Elizabeth Hoffman (*SRNL*), Elad Caspi (*Drexel Univ*), Brenda Garcia-Diaz (*SRNL*), Gordon Kohse (*MIT*), Robert L. Sindelar (*SRNL*), Michel W. Barsoum (*Drexel Univ*)

A Study on Compatibility of Ferritic-Martensitic Steels with High Temperature Sodium for SFR Application, Sang Hun Shin (*UNIST*), Jun Hwan Kim (*KAERI-Korea*), Ji Hyun Kim (*UNIST*)

On-line Corrosion Monitoring Analysis of Ferritic-Martensitic Steels in High Temperature Liquid Sodium Environment: UCFR Application, Sang Hun Shin, Jeong Hyun Lee, Ji Hyun Kim (*UNIST*)
Nuclear Applications of 58Ni-Depleted Nickel Alloys and Superalloys, David A. Bloore, Charles W. Forsberg (*MIT*)

High Temperature and Pressure Stress Corrosion Cracking System, Yi Xie, Jinsuo Zhang (*Ohio State*)

Techniques to Improve Corrosion Resistance of Multifunctional Materials, James Carr (*Virginia Commonwealth Univ*), Luke Butler, Paul Cicero (*Virginia Military Institute*), Gokul Vasudevamurthy (*Virginia Commonwealth Univ*)

Autoclave-Based Corrosion Rate Measurements in Support of Generic Safety Issue 191, Erik A. Lahti, Jinsuo Zhang (*Ohio State*)

HIGHLIGHTS OF NURETH-15-PAPERS/PANEL

Sponsored by THD

Session Organizer: Francesco D’Auria (*Univ of Pisa*)

PAPERS:

General View of the NURETH-15 Conference, Francesco D’Auria, Nusret Aksan (*Univ of Pisa*), Alessandro Petrucci (*Nuclear Research Group of San Piero a Grado*)

The conduct of NURETH-15 pre-workshops and post-workshops, Tomasz Kozlowski (*Univ of Illinois*), Alessandro Petrucci (*Univ of Pisa*), invited

PANEL DISCUSSION:

The fifteenth International Topical Meeting on Nuclear Reactor Thermal-Hydraulics (NURETH-15) was held in Pisa from May 12-17, 2013. The objectives of this panel session (at the 2013 ANS Winter Meeting) is to underline some initiatives undertaken during the NURETH-15 Conference other than to summarize the key outcomes. The ideas to have NURETH Fellows and the consideration of specific Student and Poster Sessions are among those initiatives.

PANELISTS:

- N. Aksan (*University of Pisa*)
- N. Todreas (*MIT*)
- Y. Hassan (*Texas A & M*)
- T. Kozlowski (*University of Illinois at Urbana-Champaign*)
- C. Frepoli (*Westinghouse*)
- B. Martin (*B&W*)
- H. Ninokata (*Polytechnic of Milan*)

THERMAL-HYDRAULICS CODE VERIFICATION AND VALIDATION—I

Sponsored by THD

Session Organizer: Sama Bilbao y Leon (*Virginia Commonwealth Univ*)

Analysis of a DVI Line Break Accident at the ATLAS Facility, Heeran Ko, Taewan Kim (*KEPCO International Nuclear Graduate School*)

Steady State and Transient Thermal-Hydraulic Analysis of PHWR Using COBRA-3C/RERTR, Ahmad Hussain, Mohammad Aljohani (*King Abdulaziz Univ*), Shoib Usman (*Univ of Science and Technology*)

Analysis of Blowdown Event in Small Modular Natural Circulation Integral Test Facility, Brian J. Wolf, Matt Kizerian, Scott Lucas (*NuScale Power, LLC*)

Predictions of Subcooled Boiling Steam-Water Flows with the IATE in TRACE-T, Matthew S. Bernard, Ted Worosz, Seungjin Kim (*Penn State*), Chris Hoxie (*NRC*)

Implementation of Helical Tube Heat Transfer Correlations of TRACE for Analyzing Helical Type Steam Generator in Sodium-cooled Fast Reactor, Ji-hun Kim (*KINS-Korea*)

LOFT L9-3 Experiment Simulation using the SPACE Code, Chang-Keun Yang, Yo-Han Kim, Sang-Jun Ha (*KHNP Central Research Institution*)

Thermal-Hydraulic Transient Code-to-Code Benchmark in a Simplified EBR-II Geometry, Roberto Zanino, Roberto Bonifetto (*Politecnico Di Torino, Italy*), Alessandro Del Nevo (*Enea Brasimone, Italy*), Emanuela Martelli (*Universita' Di Roma, Italy*), Laura Savoldi Richard (*Politecnico Di Torino, Italy*)

Assessment of TRACE Fuel Rod Model Using IFA-431 Experiments, Yu Chiang (*National Tsing Hua Univ*), Hao-Tzu Lin, Jong-Rong Wang (*Institute of Nuclear Energy Research, Atomic Energy Council*), Chunkuan Shih (*National Tsing Hua Univ*)

TUESDAY, NOVEMBER 12, 2013, 4:30 P.M.

TPC SPECIAL SESSION: ENVIRONMENTAL CONSIDERATIONS IN LONG-TERM ENERGY POLICY, INCLUDING THE ROLE OF NUCLEAR ENERGY AND ITS CONTRIBUTION TO REDUCING GREEN-HOUSE GAS EMISSIONS.

Session Organizer: Linda H. Hansen (*ANL*)

This session will review the primary requirements for a long-term energy policy and the role that nuclear will have to play in a steady-state mode. Among these requirements are: economic viability, sustainability, reduction in greenhouse gas emissions, and material-resource availability. Special emphasis will be given to discussing the role that fast-neutron-fission technology can play and will have to play. The limitations of so-called “renewable” (primarily wind and solar) to deliver base-load electric energy economically and reliably to the electric grid will be discussed.

PANELISTS:

- Charles Till (*consultant*)
- James Hansen (*Columbia Earth Institute, NASA-ret.*)
- Pete Lyons (*DOE*)
- Nobuo Tanaka (*Institute of Energy Economics, Japan*)
- Daniel Meneley (*UOIT, Canada*)
- Tom Blees (*author “Prescription for the Planet”*)
- Joseph Shuster (*author “Beyond Fossil Fools”*)

TUESDAY, NOVEMBER 12, 2013, 7:00 P.M.

UPDATE ON DOE IRP PROJECT: INTEGRAL INHERENTLY SAFE LIGHT WATER REACTOR (I₂S-LWR)

Sponsored by RPD

Session Organizer: Bojan Petrovic (*Georgia Tech*)

Under the DOE IRP Sponsored Project, a multidisciplinary team led by Georgia Tech, with team members from academia, industry, national laboratory, and international, is developing a concept of an Integral Inherently Safe Light Water Reactor (I₂S-LWR). This panel will start with an introductory presentation summarizing the concept, objectives, and work performed so far, followed by a Q&A discussion.

PANELISTS:

- Paolo Ferroni (*Westinghouse*)
- Ali Haghighat (*Virginia Tech*)
- Annalisa Manera (*Univ of Michigan*)
- Belle Upadhyaya (*Univ of Tennessee*)

BEST OF DD&R 2012—PANEL

Sponsored by DESD

Session Organizer: Sue Aggarwal (*NMNT International*)

The purpose of this session is to provide a forum at an ANS National meeting for some of the best papers presented at the DD&R 2012 Topical Meeting at the ANS 2012 Annual Meeting. The papers will cover a range of subjects and have been judged by their peers as the most interesting and timely papers presented at the Topical Meeting.

PANELISTS:

- Jim McKenna (*AECL*)
Decommissioning Projects at the Chalk River Laboratories
- Michael Anderson (*Siempelkamp Nuclear Services*)
Segmentation Tooling for Use in Radiologically Contaminated Facilities

WINTER MEETING TECHNICAL SESSIONS BY DAY: TUESDAY

- Dustin Miller (*Univ of Illinois*)
TRIGA Research Reactor
- William J. (Bill) Szymczak (*ZionSolutions*)
Dry Cask Storage Project

THERMAL-HYDRAULICS CODE VERIFICATION AND VALIDATION—II

Sponsored by THD

Session Organizer: Philippe M. Bardet (*The George Washington Univ*)

Uncertainty Analysis Using Beta-Bayesian Approach in Nuclear Safety Code Validation, Chengcheng Deng (*Tsinghua Univ*), Weili Liu (*China Institute of Atomic Energy*), Huajian Chang (*Tsinghua Univ*), Qiao Wu (*Oregon State Univ*)

Phenomena Identification and Ranking Matrix (PIRM) for the Pebble Bed Fluoride-Salt-Cooled, High-Temperature Reactor (PB-FHR), Raluca O. Scarlat, Nicolas Zweibaum, Per F. Peterson (*Univ of California, Berkeley*)

Model Development for Nuclear Fuel Assembly Response to Seismic Loads, Noah Weichselbaum, Morteza Rahimi-Abkenar, Oren Breslouer, Elias Balaras, Majid Manzari, Philippe M. Bardet (*The George Washington Univ*)

SCRED Database to Support BEPU Licensing, Alessandro Petruzzi (*Nuclear Research Group of San Piero a Grado*), Francesco D'Auria (*Univ of Pisa*), Andriy Kovtonyuk (*Nuclear Research Group of San Piero a Grado*)

MARS-KS Code Analysis for Integral Effect Test of the Feedwater Line Break Accident with PAFS (Passive Auxiliary Feedwater System), Byoung-Uhn Bae, Seok Kim, Yu-sun Park, Kyoung-ho Kang (*KAERI-Korea*)

EXPERIMENTAL THERMAL HYDRAULICS—II

Sponsored by THD

Session Organizer: Xiaodong Sun (*Ohio State*)

Visual Study of Interfacial Structures in a Rectangular Channel, Yang Liu, Matthew Williams (*Virginia Tech*)

Air-Water Bubbly Flows across a 90-Degree Vertical-Upward Elbow, Theodore S. Worosz, Mohan Yadav, Seungjin Kim (*Penn State*), Stephen M. Bajorek, Kirk Tien (*NRC*)

Local Turbulence Characterization in Subcooled Flow Boiling, Carlos E. Estrada Perez, Junsoo Yoo, Yuan Di, Yassin A. Hassan (*Texas A&M*)

A Method of Recognizing Overlapping Elliptical Bubbles in Bubble Images, Yuan Di (*Department of Nuclear Engineering, Texas A&M University*), Yassin A. Hassan, Carlos E. Estrada-Perez, Junsoo Yoo (*Texas A&M*)

Shadowgraphy Measurement for Isothermal Two Phase Bubbly Flow, Abelardo Hernandez-Rubio, Yassin A. Hassan, Carlos Estrada-Perez, Junsoo Yoo (*Texas A&M*)

Identification of Critical Issues for the Visual Measurement of Fundamental Bubble Parameters in the Subcooled Boiling Flow, Junsoo Yoo, Carlos E. Estrada-Perez, Abelardo H. Rubio, Yassin A. Hassan (*Texas A&M*)

FLOOD HAZARD ASSESSMENTS AND FLOOD PROTECTION ISSUES FOLLOWING THE FUKUSHIMA DAIICHI EVENTS—PANEL

Sponsored by DESD

Session Organizers: Thomas Nicholson (*NRC*) and James Bollinger (*DOE*)

Following the extreme natural events at Fukushima Daiichi in March 2011, regulatory agencies (e.g., U.S. NRC and the Canadian Nuclear Safety Commission) have worked with their licensees to address hazards from natural events (e.g., flooding and seismic hazards). Significant efforts are being spent to address flood-causing events and processes at nuclear facilities. These flooding mechanisms include: local intense precipitation; hurricane and storm surges; tsunamis; riverine flooding; dam and levee failures; and combined events. The panel discussion will focus on strategies and methods being used to evaluate flood hazards, and their consequences. Flood protection will also be discussed to understand possible mitigative means to reduce the consequences. Information sources and hydrometeorologic flood analysis methods will be solicited from the panelists.

INDUSTRY PANELISTS:

- Jim Riley (*Nuclear Energy Institute*), NEI principal engineer responsible for managing the regulatory aspects of flooding lessons learned from the March 2011 accident at Fukushima Daiichi
- NEI Task Force members: Joe Gasper (*OPPD*); Joe Bellini (*AMEC/Exelon*); Heather Smith Sawyer (*BWSC*)
- Ray Schneider (*Westinghouse*)

U.S. NRC PANELISTS:

- Nilesh Chokshi, Deputy Director, DSEA/NRO/NRC and Team Leader for the Japanese Lessons Learned Directorate (*JLD*) Task Force on Flooding and Seismic Events
- Christopher Cook, Chief, RHMB/DSEA/NRO/NRC, JLD's Recommendations 2.1 on Flooding and 2.3 on Flood Protection
- Michelle (Shelby) Bensi, Civil Engineer, DSEA/NRO/NRC, "Guidance for Performing the Integrated Assessment for Flooding" JLD-ISG-2012-05 (ADAMS ML ML12311A214)
- Jacob Philip, Senior Geotechnical Engineer, ETB/DRA/RES/NRC, Flood Protection at Nuclear Power Plants

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

WEDNESDAY, NOVEMBER 13, 2013

7:30 a.m. - 5:00 p.m. **Meeting Registration**

8:00 a.m. - 10:00 a.m. **Spouse/Guest Hospitality**

8:00 a.m. - 11:45 a.m. **2013 ANS Winter Meeting:
Technical Sessions**

- Advanced Modeling and Simulation in Reactor Physics
- New Nuclear Construction Around the World—Status Report—Panel
- Nuclear Fuel Cycle Resources, Sustainability, Reuse and Recycle
- Computational, Uncertainty Quantification, and Sensitivity Analysis Methods
- Fuel Cycle Options: A Physics Perspective
- Illicit Trafficking Radiation Sensor Assessment Program (ITRAP 10) Highlights
- Nuclear Plant I&C Modernization
- Human Factors Engineering for Nuclear Plants
- Aerospace Nuclear Science and Technology: General
- Computational Thermal Hydraulics—II
- Data and Analysis in Nuclear Criticality Safety—II
- Young Professional Thermal-Hydraulics Research Competition

1:00 p.m. - 4:00 p.m. **2013 ANS Winter Meeting:
Technical Sessions**

- Reactor Physics Analysis Methods—II
- Current Assessment of Objectives and Outcomes of 10 CFR Part 52—Panel
- Fuel Cycle and Waste Management: General
- FY2012 Recent Nuclear Criticality Safety Program Technical Accomplishments
- Nuclear Fuel
- Applications of Activation Analysis in Historical Research—Session Honoring J. M. Blackman
- Reactor Physics: General—III
- Best of ICRS/RPSD 2012
- Environmental Sciences: General
- Implementation of Successful Nuclear Education Programs in the United States—Panel

WEDNESDAY, NOVEMBER 13, 2013

1:00 p.m. - 4:00 p.m. **2013 ANS Winter Meeting:
(cont.) Technical Sessions**

- Enrollment Diversity and Nuclear Engineering—Panel
- Thermal-Hydraulics Reactor Analyst 2.0—Panel

4:00 p.m. - 6:30 p.m. **2013 ANS Winter Meeting:
Technical Sessions**

- Nuclear Fission: 75-Year Anniversary—Panel
- Operations and Power: General—II
- Advances in Aqueous Separation Methods and Waste Treatment
- Computational Thermal Hydraulics—III
- Mathematical Modeling: General
- Accelerator Applications: General
- Research at the NRC
- Modeling and Transport of Radioactive Materials in the Environment
- Cutting Edge Techniques in Education, Training, and Distance Learning
- General Two-Phase Flow
- Developments and Applications of Neutron Beam Techniques
- Innovations in Radiation Detectors: New Designs, Improvements, and Applications

WEDNESDAY, NOVEMBER 13, 2013, 8:00 A.M.

ADVANCED MODELING AND SIMULATION IN REACTOR PHYSICS

Sponsored by RPD

Session Organizer: Alexander Stanculescu (INL)

Domain Decomposition of Combinatorial Geometry Monte Carlo Transport Code JMCT, Gang Li, Baoyin Zhang, Li Deng (*Institute of Applied Physics and Computational Mathematics*)

Simulation of the Full-core Pin-model by JMCT Monte Carlo Code, Deng Li, Li Gang, Zhang Baoyin (*The Institute of Applied Physics and Computational Mathematics*), invited

Tallying Scheme of JMCT-A General Purpose Monte Carlo Particle Transport Code, DanHua ShangGuan, Li Gang, Deng Li, Zhang BaoYin (*Institute of Applied Physics and Computational Mathematics*)

Development of a Monte Carlo based PBR Fuel Management Code, Topan Setiadipura, Toru Obara (*Tokyo Inst Technol*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

Development and Validation of K-effective Calculation in SuperMC 2.0, Jing Song, Guangyao Sun, FDS Team (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

Estimation of Self-Shielding Effect on Uncertainty of Neutronics Characteristics Using Random Sampling Method and Continuous-Energy Slowing-Down Calculation, Akio Yamamoto, Tomohiro Endo, Shunsuke Sato (*Nagoya Univ*)

Improved Methods for Calculating SFR Feedback Reactivity Coefficients, Cyrille Bouret, L. Buiron, G. Rimpault (*CEA*)

Rossi-Alpha Distribution Calculation Using CUDA Parallel Computing Platform, Alberto Talamo, Mohamed Y. Gohar (*ANL*)

Structural Analysis of IBR-2 Based on Continuous Time Canonicity, Marina Demeshko, Takashi Washio (*Osaka Univ*), Yuriy Pepyolyshev (*Joint Institute of Nuclear Research*)

NEW NUCLEAR CONSTRUCTION AROUND THE WORLD-STATUS REPORT-PANEL

Sponsored by OPD

Session Organizer: Edward L. Quinn (*Technology Resources*)

This panel provides the latest information on the status and progress in new nuclear construction around the world including government, regulatory, owner-operator, and vendor input. Speakers address the latest in key issues that impact on the selection of new designs and the status of construction activities.

PANELISTS:

- John Kelly (*DOE*)
- David Matthews (*NRC*)
- Doug Walters (*NEI*)
- Other panelists to be determined

NUCLEAR FUEL CYCLE RESOURCES, SUSTAINABILITY, REUSE AND RECYCLE

Sponsored by FCWMD

Session Organizer: Guillermo Daniel DelCul (*ORNL*)

Feasibility Study to Combine Chemical Decladding and Zirconium Recovery and Recycle, Emory D. Collins, Guillermo Daniel DelCul, Barry B. Spencer, Ronald Ray Brunson, Jared A. Johnson (*ORNL*)

Thorium-Uranium Fuel Cycle Based on Fusion-Driven Subcritical Reactor and PWR, Liangzhi Cao, Yunli Xie, Hongchun Wu, Youqi Zheng, Yunzhao Li (*Xi'an Jiaotong Univ*)

Preliminary Neutronics Analysis of GDT-based Spent Fuel Burner Blanket, Chao Lian, Yican Wu, FDS Team (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

Accelerator-Driven Fission in a Molten Salt Core: Method to Destroy the Transuranics in Used Nuclear Fuel, Peter McIntyre, Saeed Assadi, Nathaniel Pogue, Dior Sattarov, Pavel Tsvetkov (*Texas A&M*)

Safety and Reliability in Accelerator-Driven Subcritical Fission in a Molten Salt Core, Peter McIntyre, Saeed Assadi, James Gerity, Akhdiyor Sattarov, Pavel Tsvetkov, Nathaniel Pogue, Jesse Johns (*Texas A&M*)

Toward a Theory of Stakeholder Acceptance for New Nuclear Projects, Michael Golay, Adam D. Williams, Ekaterina Paramonova (*MIT*)

Preliminary Neutronics Analysis of a Spallation Target for Transmutation, Zijia Zhao, Yican Wu (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

High-Resolution Modeling of Energy Systems to Assess the Viability of Advanced Nuclear Technology Development, Anne-Perrine Avrin, Gang He, Daniel Kammen (*Univ of California, Berkeley*)

Monitoring the Inventory of Transuranics Extracted into Molten Salt from UNF: In-Situ Safeguard for Non-Proliferation, Peter McIntyre, Saeed Assadi, Hyocheol Lee, Akhdiyor Sattarov, Nathaniel Pogue, Elizabeth Sooby, Pavel Tsvetkov (*Texas A&M*)

COMPUTATIONAL, UNCERTAINTY QUANTIFICATION, AND SENSITIVITY ANALYSIS METHODS

Sponsored by MCD

Session Organizer: Brian C. Franke (*SNL*)

K-Eigenvalue Sensitivity Coefficients to Legendre Scattering Moments, Brian C. Kiedrowski (*LANL*)

A New Method for Calculating Generalized Response Sensitivities in Continuous-Energy Monte Carlo Applications in SCALE, Christopher M. Perfetti, Bradley T. Rearden (*ORNL*)

Physics-Based Uncertainty Quantification for the ZrHx Thermal Scattering Law, Weixiong Zheng, Ryan G. McClarren (*Texas A&M Univ*)

Unified Monte Carlo: Evaluation, Uncertainty Quantification and Propagation of the Prompt Fission Neutron Spectrum, Michael E. Rising, Patrick M. Talou (*LANL*), Anil K. Prinja (*Univ of New Mexico*)

Investigating the Impact of Angular Vectorization on KBA Performance, Robert Joseph Zerr (*LANL*)

Rate of Convergence of the PN Transport Solution in a 1D Infinite Medium, Barry Ganapol (*Nuclear Consultants*), R. Martineau, Rick Gleisher (*INL*)

A Spherical Harmonic PN Implementation for the Second Order Form of the Neutron Transport Equation for the RattleSnake Application under the MOOSE Framework, Frederick N. Gleicher, Y. Wang (*INL*), B. D. Ganapol (*Univ of Arizona*), R. C. Martineau (*INL*)

Employing Non-Converged Solution Iterates for Reduced Order Modeling, Bassam Abdullah Khuwaileh, Young Suk Bang, Congjian Wang, Hany S. Abdel-Khalik (*NCSU*)

Exploratory Development of Multi-Physics Reduced Order Modeling II, Bassam Abdullah Khuwaileh, Hany S. Abdel-Khalik (*NCSU*)

FUEL CYCLE OPTIONS: A PHYSICS PERSPECTIVE

Sponsored by RPD

Session Organizer: Andrew Worrall (ORNL)

Options Development for Comprehensive Fuel Cycle Analysis, Roald Wigeland (INL), Temitope A. Taiwo, Taek K. Kim (ANL), Michael Todosow (BNL), invited

Thorium-Fueled Breed and Burn Core with Low Enriched Uranium Support, Florent Heidet, Taek Kyum Kim, Temitope A. Taiwo (ANL)
Reactor Physics Analysis of Thorium Fuel Cycles Using Molten Salt Reactors, Jeffrey J. Powers, Andrew Worrall, Jess C. Gehin, Thomas J. Harrison (ORNL), Eva E. Sunny (Univ of Michigan)

Assessment of Once-Through Thorium Fuel Cycles in Subcritical Systems Driven by a Fusion-Fission Hybrid, Massimiliano Fratoni (Penn State), J. J. Powers (ORNL), W. Halsey (LLNL), E. Sunny (ORNL), J. Blink, H. Greenberg, M. Sutton (LLNL)

Analysis of an Accelerator Driven System with Natural Uranium Fuel, Hans Ludwig, Arnold Aronson, Nicholas R. Brown, Gilad Raitses, Michael Todosow (BNL)

Multiple-Stage Fuel Cycle Options Based on Subcritical Systems, Florent Heidet, Taek Kyum Kim, Temitope A. Taiwo (ANL)

Reactor Physics Analysis of CANDU HWR Fuel Cycle Options, Ronald J. Ellis (ORNL)

Simplified Fuel Cycle Cost Model Applied to LCSR Parametric Studies, Bojan Petrovic, Spenser M. Lewis (Georgia Tech)

Feasibility of Fueling the Current PWR Fleet with Thorium-Based MOX, Lucas P. Tucker (Missouri Univ Sci Technol), A. B. Alajo, S. Usman (Missouri Univ Sci Tech)

ILLICIT TRAFFICKING RADIATION SENSOR

ASSESSMENT PROGRAM (ITRAP IO) HIGHLIGHTS

Sponsored by RPSD

Session Organizer: Raymond Klann (ANL)

The Illicit Trafficking Radiation Assessment Program+IO (ITRAP+IO) - Overview, Luc Y. Murphy (Domestic Nuclear Detection Office (DNDO)), M. Marin-Ferrer (Joint Research Center Nuclear Security Unit)

Nuclear Security Applications of Personal Radiation Detectors, Daniel Weidinger (Department of Homeland Security Domestic Nuclear Detection Office), R. Pelfrey (SRNL), D. Walker (Global Testing Laboratories), L. Murphy (Department of Homeland Security)

Standards Testing of Hand-Held Radioisotope Identification Systems, Jennifer Jo Ressler, D. Trombino (LLNL), P. Dimmerling, A. Kriss, M. Demboski (PNNL), L. Murphy (DNDO)

Comparisons of Hand-Held and Pager Radioisotope Identification Systems for Inspections, Jennifer Jo Ressler (LLNL), J. Koglin (LLNL, Penn State Univ.), S. Sangiorgio (LLNL), L. Murphy (DNDO)

ITRAP+IO Testing of Gamma and Neutron Search Devices, Raymond T. Klann, Mitchell Mannino, Lindsay Brandt (ANL)

Nuclear Security Applications of Mobile Radiation Detection, Mansie Iyer (Domestic Nuclear Detection Office/Noblis SETA Contractor), P. Dimmerling, A. Kriss, M. Demboski (PNNL), L. Murphy (Domestic Nuclear Detection Office)

ITRAP+IO Spectroscopic Radiation Portal Monitor Testing, A. L. Sallaska, L. Pibida, H. Chen-Mayer (NIST), C. Ward (ORNL), L. Murphy (Department of Homeland Security Domestic Nuclear Detection Office)

Replacing Copper Shielding with Steel for Weapons Grade Plutonium: A Look at Spectral and Physical Differences, James N. Cantrell (Univ of Tennessee), Timothy E. Margrave (ORNL)

Lessons Learned from Standards-Based Radiation Detector Testing, Aaron Kriss, Michael Demboski (PNNL)

NUCLEAR PLANT I&C MODERNIZATION

Sponsored by HFICD

Session Organizer: Sacit M. Cetiner (ORNL)

Mitsubishi Experience on Digital I&C and Modernization, Yuichi Tanaka, Richard Patrick Samples, Shinji Kiuchi (Mitsubishi Nuclear Energy Systems, Inc.)

Structural Health Monitoring with Piezoelectric Wafer Active Sensors, Adrian E. Mendez Torres (SRNL), Victor Giurgiutiu (Univ of South Carolina), Poh Sang-Lam (SRNL), Mathieu Gresil, Bin Lin (Univ of South Carolina)

Status of the Major Refurbishment and Digital Conversion of the University of Florida Training Reactor, Kelly A. Jordan, Katherin L. Goluoglu, Brian Shea (Univ of Florida)

Human Factors Engineering Experience Applied to Human-System Interface Modernization, Luis Fernández Illobre, Pedro Trueba Alonso, Fernando Ortega Pascual (Tecnatom)

HUMAN FACTORS ENGINEERING FOR NUCLEAR PLANTS

Sponsored by HFICD

Session Organizer: Sacit M. Cetiner (ORNL)

A Technical Skills Evaluation Method in Training for Nuclear Power Plant Operators, Hobin Yim, Poong Hyun Seong (KAIST)

A Systematic Approach to Design the Automatic System's HSI: FWCS, Nuraslinda Anuar, Jonghyun Kim [KEPCO International Nuclear Graduate School (KINGS)]

Proposal on Framework for Measurement of Workload of Operators in Advanced MCR, Seunghwan Kim, Yochan Kim, Wondea Jung (KAERI-Korea)

A Model for Procedure Use, Kara Anne Schmitt (Florida Institute of Technology), Thomas Waicosky (Duke Energy)

Micro worlds, Alarms, and Human Performance: A Controlled Setting for Small Tasks, Great and Noble, David I. Gertman, Vivek Agarwal, Ronald Boring (INL)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY:

GENERAL

Sponsored by ANSTD

Session Organizer: Martin B. Sattison (INL)

Update on ²⁴¹Americum Production for use in Radioisotope Power Systems, Timothy Peter Tinsley, Mark John Sarsfield (*National Nuclear Lab*)

MEGAHIT: Megawatt Highly Efficient Technologies for Space Power and Propulsion Systems for Long Duration Exploration Missions - Advanced Propulsion Roadmap for HORIZON2020, Timothy Peter Tinsley (*National Nuclear Lab*), Jean-Claude Worms (*European Science Foundation*), Elisa CliquetMorneo (*Centre National d'Etudes Spatiales*), Emmanouil Detsis (*International Space University*), Enrico Gaia (*Thales Alenia Space Italia*), Frank Jansen (*Institute of Aerospace Systems*), Gaetano Poidomani (*Thales Alenia Space Italia*), Jean-Marc Ruault (*Centre National d'Etudes Spatiales*), Zara Hodgson (*National Nuclear Lab*)

Design for a Fusion Space Probe - Viper Pulsed Fusion Rocket, George Miley (*Univ of Illinois, Urbana-Champaign*)

Analysis of Monte Carlo Transport Code - PHITS for Solar Particle Events Source, Sirikul Sripisan, Suresh K. Aghara (*Univ of Massachusetts Lowell*), Robert Singleterry (*NASA, Langley*)

Low Enriched Uranium Fuels in NERVA Type Nuclear Thermal Rockets, Paolo Francesco Venneri, Yonghee Kim (*KAIST*)

A Proposed NASA Research Reactor at Stennis Space Flight Center, Michael G. Houts (*NASA/MSFC*), Harold Gerrish (*NASA*), Leroy Hardin (*NRC*)

COMPUTATIONAL THERMAL HYDRAULICS—II

Sponsored by THD

Session Organizer: Igor A. Bolotnov (NCSU)

Thermal Stratification Modeling in Suppression Pool with GOTHIC 8.0, Ozkan Emre Ozdemir, Thomas L. George (*Zachry Nuclear Engineering, Inc., Numerical Applications Division*)

Multi-Physics Computational Models Development for Westinghouse PWRs, Jin Yan, Yiban Xue, Peng Yuan, Andrew Petrarca, Zeses Karoutas (*Westinghouse*), Robert Brewster (*CD-adapco*), Emilio Baglietto (*MIT*)

Blow-Down Analysis Using Off-Set Fin Heat Exchanger with RELAP5-3D, Caleb Robison, Fatih Aydogan (*Univ of Idaho*)

Steady State COMSOL Thermal-Hydraulics Models for ORNL's High Flux Isotope Reactor, Vaibhav B. Khane (*Missouri Univ Sci Tech, Rolla*), Prashant K. Jain (*ORNL*)

Natural Circulation in HTGR Type System with Coolant Channels in Simplified Graphite-Fuel Matrix, Francisco Ivan Valentin, Hitesh Bindra, Masahiro Kawaji (*City College of New York*)

Study of Two Particular Cases of Abnormal Heat Transfer Phenomena Occurring in a VHTR Reactor Core, Francisco Ivan Valentin, Ryan Anderson, Masahiro Kawaji (*City College of New York*)

Numerical Study on the Crossflow Printed Circuit Heat Exchanger for Advanced Small Modular Reactors, Sujong Yoon (*INL*), Eung Soo Kim (*Seoul Natl Univ-Korea*), Piyush Sabharwal (*INL*)

Radial Nodalization Sensitivities in the Subchannel Code VIPRE-01, Michael Sean Bradbury (*Babcock & Wilcox mPower, Inc.*), Ruwan K. Ratnayake (*Babcock & Wilcox*)

Heat Transfer Research of Corium by Finite Element Method, Wei Bai, WeiFeng Ni (*State Nuclear Power Software Development Center*), Tao Huang (*Xian Jiao Tong University*), Yanhua Yang (*State Nuclear Power Software Development center*)

DATA AND ANALYSIS IN NUCLEAR CRITICALITY

SAFETY—II

Sponsored by NCSD

Session Organizer: Allison D. Miller (SNL)

A Doppler-Broadening Method for Generating Multi-temperature Neutron Cross Section Libraries, Chong Chen (*University of Science and Technology of China*), Yican Wu (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

Temperature Sensitivity of Neutron Multiplication in Highly Enriched Uranium Solutions, Daniel Francis Hollenbach, Karla Elam Hollenbach (*Spectra Tech Inc.*)

Measurement of Prompt Fission Neutron Spectrum Using a Gamma Tagging Method, Ezekiel Blain, Adam M. Daskalakis, Yaron Danon (*RPI*)

Prototype Fixed-Source Sensitivity Capability in MCNP6 Applied to Subcritical Thor Core Measurements, Brian C. Kiedrowski, Avneet Sood (*LANL*)

Coupled Differential and Integral Data Analysis for Improved Uncertainty Quantification, Vladimir Sobes (*ORNL/MIT*), Luiz Leal (*ORNL*), Benoit Forget (*MIT*)

Using Simulations to Determine the Energy Resolution Function of Neutron Time-of-Flight Experiments, Amanda E. Youmans, Rian Bahrn, Ezekiel Blain, Adam Daskalakis, Brian McDermott, Sean Piela, Nicholas Thompson, Adam Weltz, Yaron Danon (*RPI*)

YOUNG PROFESSIONAL THERMAL-HYDRAULICS

RESEARCH COMPETITION

Sponsored by THD

Session Organizer: Rui Hu (ANL)

Sensitivity Study of Hypothetical Debris-Generated Core Blockage Scenarios, Rodolfo Vaghetto, Andrew Franklin, Yassin A. Hassan (*Texas A&M*)

Characterization of the Laser-Imaged Natural Circulation (LINC) Facility at Oregon State University, Sam S. Goodrich, Wade R. Marcum (*Oregon State Univ*)

Bubble Coalescence Control Development for Level Set Interface Tracking Method, Matthew L. Talley (*NCSU*)

Scaling Study of the DCC Event in the HTTF Using RELAP5-3D/ATHENA, Robert J. Aldridge, Brian Woods (*Oregon State Univ*)

Interface Tracking Methods and Gas Entrainment in Liquid Flows, Matthieu Andre, Philippe Bardet (*The George Washington University*)

Velocity Measurement Reconstruction in a Rod Bundle using Particle Tracking Velocimetry, Denny Lee-Si Reyes, Elvis E. Dominguez-Ontiveros, Yassin A. Hassan (*Texas A&M*)

Characterization of the OSU HMFTF Piping System, Trevor Kent Howard, Wade R. Marcum (*Oregon State Univ*)

Air Test of the Coolant Distribution in a Two-Block Prismatic VHTR Model, Huhu Wang, Elvis Dominguez-Ontiveros, Yassin Hassan (*Texas A&M*)

Fuel Rod in Axial Flow on Integral Effects Shake Table, Noah Weichselbaum, Philippe M. Bardet, Carl Sickel, Donna Ly, Shadman Hussain, Shengfu Wang, Morteza Rahimi-Abkenar, Majid Manzari (*The George Washington University*)

WEDNESDAY, NOVEMBER 13, 2013, 1:00 P.M.

REACTOR PHYSICS ANALYSIS METHODS—II

Sponsored by RPD; cosponsored by MCD

Session Organizer: Alexander Stanculescu (*INL*)

Hybrid Reduced Order Modeling Algorithms for Reactor Physics Calculations, Youngsuk Bang, Hany S. Abdel Khalik (*NCSU*), invited, Mark Mills Award winner

Utilizing CMFD in OPENMC to Estimate Dominance Ratio and Adjoint, Bryan Robert Herman, Benoit Forget, Kord S. Smith (*MIT*)

Generation of Kinetics Parameters Based on the PARCS Code, Moo Hoon Bae, Yong Won Choi, Andong Shin, Namduk Suh (*KINS-Korea*)

CALIBAN Measurements Near Delayed Critical Using Subcritical Measurement Methods, Jesson D. Hutchinson, William L. Myers, Avneet Sood, Brian Rooney, Mark Smith-Nelson (*LANL*), Nicolas Authier, Amaury Chapelle, Pierre Casoli, Benoit Richard (*CEA*)

Lattice Boltzmann Methods for Nuclear Reactor Physics, Hitesh Bindra (*City College of City University of New York*)

Determining the Equivalent Reactivity of a LSCR 2D Fuel Assembly and 3D Full Core Models, Bojan Petrovic, Spenser M. Lewis (*Georgia Tech*)

Whole-Core Transport Calculation of Two-Dimensional Hexagonal HTGR Cores with Overlapping Local/Global (OLG) Iteration Framework, Han Jong Yoo (*KAIST*), Muhammad Imron (*PT. Batan Teknologi*), Nam Zin Cho (*KAIST*)

Application of Consistent Spatial Homogenization Method in Neutron Transport Theory to Pressurized Water Reactor, Saam Yasseri, Farzad Rahnema (*Georgia Tech*)

CURRENT ASSESSMENT OF OBJECTIVES AND OUTCOMES OF 10 CFR PART 52_PANEL

Sponsored by OPD

Session Organizer: N. Prasad Kadambi (*Univ of Pittsburgh*)

The USNRC regulation, 10 CFR Part 52 was promulgated as regulatory reform to resolve safety and environmental issues early in licensing proceedings, and to enhance the safety and reliability of nuclear power plants through standardization. OPD proposes a special session of invited speakers to address where we currently stand relative to accomplishing these objectives. The context for this assessment is that the regulatory process set forth in the regulation has been successfully used recently relative to two of its key provisions, namely, design certification and combined operating licensing. Yet there appears to be a sentiment among key players in Small Modular Reactors (SMRs) space that the old 10 CFR Part 50 process is preferable. Considering that SMRs are looked upon as an extremely important feature of nuclear technology's future growth, the effectiveness of 10 CFR Part 52 relative to reducing regulatory uncertainty needs to be critically examined.

PANELISTS:

- David Matthews (*NRC*)
- Jerry Wilson (*Retired, NRC*)
- Robert Bishop (*Retired, NEI*)
- Amy Aughtman (*Southern Company*)
- Peter Hastings (*B&W*)

FUEL CYCLE AND WASTE MANAGEMENT: GENERAL

Sponsored by FCWMD

Session Organizer: Jack D. Law (*INL*)

Exploring Technology Choices Against Nuclear Energy Scenarios, Fiona Elizabeth Rayment, Dan Mathers, Kevin Hesketh, Robert Gregg (*National Nuclear Lab*)

A Real Options Evaluation of New Nuclear Generating Capacity Development Relative to New Coal-Fired Generating Capacity Development, William Hamill Wilson, Bonnie Canion, Franziska Klingberg, Eric Compber, Erich Schneider (*Univ of Texas, Austin*)

Continental Seabed Disposal of Low-Level Waste: The Barge Waste Package, Aditi Verma, Charles W. Forsberg (*MIT*)

Towards the Development and Application of Borehole Virtual Reality Simulation Tools, Nazar Lubchenko, Emilio Baglietto, Michael Driscoll (*MIT*)

Consensus Yucca Mountain Demonstration Repository, Salomon Levy (*Levy & Associates*), Edward D. Fuller (*Associated Project Analysts*)

Optimizing Nuclear Waste Disposal: A Yucca Mountain Case Study, Benjamin Johnson, Jeffrey C. King, Alexandra Newman (*CSM*)

Weld Residual Stress and Used Nuclear Fuel Canister Life Prediction, Sara E. Ferry, Ronald G. Ballinger (*MIT*), Sebastien Teyseyre (*BEA*), Bradley P. Black (*MIT*)

Effects of Operating and Design Variables on the Phases' Distribution Using Gamma Ray Computed Tomography (CT) of Spouted Beds for Coating TRISO Nuclear Fuel Particles, Neven Yousif Ali, Thaar Mohammad Aljuwaya, Muthanna H. Al-Dahhan (*Missouri Univ Sci Tech*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

FY2012 RECENT NUCLEAR CRITICALITY SAFETY PROGRAM TECHNICAL ACCOMPLISHMENTS

Sponsored by NCSD

Session Organizer: Nichole Ellis (*Ellis Nuclear Engineering LLC*)

Godiva IV Critical Assembly Machine Reassembly and Startup, Joetta M. Goda, David K. Hayes, Rene G. Sanchez (*LANL*)

Neutron Capture Transmission and Scattering Measurements at the Gaertner LINAC Center, Yaron Danon (*RPI*), L. Liu, E. J. Blain, A. M. Daskalakis, B. J. McDermott, K. Ramic, C. R. Wendorff (*Gaertner LINAC Center, Rensselaer Polytechnic Institute*), D. P. Barry, R. C. Block, G. Leinweber, M. J. Rapp, T. J. Donovan, B. E. Epping (*Bechtel Marine Propulsion Corporation, Knolls Atomic Power Laboratory*)

MCNP Accomplishments for the Nuclear Criticality Safety Program, Brian C. Kiedrowski, Forrest B. Brown, Jeffrey S. Bull (*LANL*)

Establishing a United States Nuclear Accident Dosimetry Laboratory, David P. Hickman, Jennifer G. Burch, Rebecca R. Hudson, Douglas P. Mcavoy, Gary W. Slavik, Carolyn T. Wong (*LLNL*), Rashelle D. Will (*Natl Security Tech LLC*)

SCALE and AMPX Advancements to Support NCS Applications, Bradley Thomas Rearden, Michael E. Dunn, Dorothea Wiarda, Cihangir Celik (*ORNL*), Kursat B. Bekar (*ORNL/UT-Battelle, LLC*), Mark L. Williams, Douglas E. Peplow, Christopher M. Perfetti, Jordan Lefebvre (*ORNL*), Frantisek Havluj (*Nuclear Research Institute at Husinec - Řež*), Kevin J. Dugan (*Texas A&M*)

Summary of Recent Los Alamos Contributions to the Nuclear Criticality Safety Program, Robert C. Little, William L. Myers, Albert C. Kahler, Jeffrey A. Favorite, Robert W. Margevicius (*LANL*)

NUCLEAR FUEL

Sponsored by MSTD

Session Organizer: Kenneth J. Geelhood (*PNNL*)

Design and Predicted Behavior of UN-Kernel LWR TRISO, Theodore M. Besmann, Mattison K. Ferber, Hua-Tay Lin (*ORNL*)

Characterization of Oxide Fuel Surface Chemistry with Atom Probe Tomography, Billy Valderrama, Hunter B. Henderson (*Univ of Florida*), Abdel-Raman Hassan (*Purdue Univ*), Jian Gan (*INL*), Anter El-Azab (*Purdue Univ*), Michele Viola Manuel (*Univ of Florida*)

Fabrication of UO₂ Pellets by an Advanced Sintering Technique, James S. Tulenko, Ghatu Subhash (*Univ of Florida*)

Distribution and Thermal Properties of UO₂-CNT Ceramic Matrix Composites Fabricated by Spark Plasma Sintering (SPS), Andrew Robert Cartas, Haitang Wang, James Tulenko, Ronald Baney, Ghatu Subhash (*Univ of Florida*)

Performance of U-silicide Coated U-Mo Fuel Particle Dispersion in Al During Irradiation, Yeon Soo Kim (*ANL*), Jong Man Park, Ho Jin Ryu (*KAERI-Korea*)

An Investigation of U-Zr Alloy Phase Diagram using In-situ Heating Electron Diffraction, Sangjoon Ahn, Sean M. McDevitt (*Texas A&M*)

Formation Mechanism of Delta Phase in the As-cast U-Zr Alloy, Sandeep Irukuvarghula, Sean M. McDevitt (*Texas A&M*)

Electron Microprobe Examination of Metallic Fuel for Minor Actinides Transmutation in Fast Reactor, Stéphane Brémier (*European Commission, Joint research Center, Institute for Transuranium Elements*), Philipp Poeml (*European Commission, JRC*), Kenta Inagaki (*Central Research Institute of Electric Power Industry*), Luca Capriotti, Dimitrios Papaioannou (*European Commission, JRC*), Vincenzo V. Rondinella (*EC-JRC-ITU*), Hirokazu Ohta, Takanari Ogata (*CRIEPI*)

Determination of Thermal Diffusivity of Irradiated, Layered Fuel Samples, Andrew M. Casella, Sarah R. Suffield, Douglas E. Burkes (*PNNL*)

APPLICATIONS OF ACTIVATION ANALYSIS IN HISTORICAL RESEARCH—SESSION HONORING J. M. BLACKMAN

Sponsored by BMD; cosponsored by IRD

Session Organizer: Rolf L. Zeisler (*NIST*)

Chemical Characterization by INAA of Obsidian Sources from SW Asia and the Arabian Peninsula, M. James Blackman (*Department of Anthropology NMNH Smithsonian Institution*), invited

Mining the Maya: 50 Years of Data Generation and Interpretation, Ronald L. Bishop (*Smithsonian Institution*), invited

Stepping into Some Pretty Big Shoes: Following in the Tradition of Jim Blackman in the Ancient Near East, Leah D. Minc (*Oregon State Univ*), invited

Quantifying Ceramic Paste Standardization: A Case Study from Oaxaca, Mexico, Jeremias Pink (*Oregon State Univ*), invited

Interaction between Puebloan Villages from the West-Central to the Rio Grande Regions of New Mexico, William D. James, Suzanne L. Eckert (*Texas A&M*), Judith A. Habicht-Mauche (*Univ of California Santa Cruz*), invited

New Dendrochemical Findings For Pinus Nigra Trees Grown In The Mediterranean Region, Dagistan Sahin (*NIST*), Kenan Unlu (*Penn State*), Peter I. Kuniholm, Charlotte Pearson (*Univ of Arizona*), invited

Production Locations of Mesoamerican Plumbate Ware Identified by INAA and Confirmed by Archaeological Fieldwork, Hector Neff (*California State University Long Beach*), invited

REACTOR PHYSICS: GENERAL—III

Sponsored by RPD

Session Organizer: Alexander Stanculescu (*INL*)

Monte Carlo Doppler Temperature Coefficients with Perturbation Theory, Matthew Alejandro Gonzales (*Univ of New Mexico*), Brian C. Kiedrowski, Forrest B. Brown (*LANL*), Anil K. Prinja (*Univ of New Mexico*)

Verification and Validation of MHI Nuclear Design Code System GalaxyCosmo-S, Kazuki Kirimura, Kazuya Yamaji, Shinya Kosaka, Hideki Matsumoto (*Mitsubishi*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

Two Dimensional Calculations for Liquid Salt Cooled Reactors, Nathan M. George (*Univ of Tennessee*)

Fuel Element Design and Analysis for Advanced Test Reactor Conversion to LEU Fuel, Mark D. DeHart (*INL*), Michael A. Pope (*Battelle Energy Alliance*)

Development of MHI Core Analysis Code Package Based on GalaxyCosmo-S, Kazuki Kirimura, Kazuya Yamaji, Shinya Kosaka, Hideki Matsumoto (*Mitsubishi*)

Neutronic Performance of Accident Tolerant Fuels, Rachel A. Shapiro, Ian M. Younker, Massimiliano Fratoni (*Penn State*)

Eigenfunction Expansion of the Space-Time Dependent Neutron Survival Probability, Ryan J. Kamm (*SNL*), Anil K. Prinja (*Univ of New Mexico*)

BEST OF ICRS/RPSD 2012

Sponsored by RPSD

Session Organizer: Arzu Alpan (*Westinghouse*)

Shielding and Activation Calculations for the FASTEF-MYRRHA ADS Design in the Subcritical Operation Mode, Anna Ferrari (*Helmholtz-Zentrum Dresden-Rossendorf*), S. Di Maria (*ITN, Portugal*), M. Sarotto (*ENEA, Italy*), A. Stankovskiy (*SCK-CEN, Belgium*), invited

A Tangible Augmented Reality System to Support Comprehension of Radiation Shielding, Ayako Yano (*Osaka Univ*), Hideki Tenzou, Shougo Yamashita, Kouhei Motoki (*Kagawa National College of Technology*), invited

Measurement of Radioactive Fragment Production Excitation Functions of Lead by 400 MeV/u Carbon Ions, Tatsuhiko Ogawa (*JAEA-Japan*), M. N. Morev (*Science and Engineering Center for Nuclear and Radiation Safety*), T. Kosako (*Univ of Tokyo*), invited

Analyses of TIARA Shielding Benchmark Experiments Using the FENDL-3 Library, Keitaro Kondo, Ulrich Fischer (*KIT*), invited

MCNP Neutron Streaming Investigations from the Reactor Core to Regions Outside the Reactor Pressure Vessel for a Swiss PWR, Ben F. Volmert (*Nagra*), Elena Tamaseviciute (*ETH Zurich, Switzerland*), Manuel Pantelias (*Nagra, Switzerland*), Beat Bitterli (*NPP Goesgen, Switzerland*), invited

Development of a Calculation System for Decontamination Effect Estimation, Daiki Satoh, Kensuke Kojima, Akito Oizumi, Norihiro Matsuda, Hiroki Iwamoto, Teruhiko Kugo (*JAEA-Japan*), Yukio Sakamoto (*ATOX Co., Ltd.*), Akira Endo, Shigeaki Okajima (*JAEA-Japan*), invited

Estimation of Surface Concentration of Radon Decay Products from Gamma Dose Rate Change after Rain, Jun Hirouchi, Shigekazu Hirao, Jun Moriizumi (*Nagoya Univ*), Atsuo Suzuki (*Shizuoka Prefectural Environmental Radiation Monitoring Center*), Hiromi Yamazawa (*Nagoya Univ*), invited

Beta Ray Coincidence in Radioactivity Measurement of Mixed Radionuclide Samples, Yasuhiro Unno (*NIAIST-Japan*), Toshiya Sanami, Masayuki Hagiwara, Shinichi Sasaki (*High Energy Accelerator Research Organization (KEK)*), Akira Yunoki (*NIAIST*), invited

Polygon-Mesh Computational Human Phantom Representing

ICRP Reference Male, Yeon Soo Yeom, Min Cheol Han, Chan Hyeong Kim (*Hanyang University*), invited

Extreme Solar Particle Event Radiation Exposures on Mars, Lawrence W. Townsend, Anne Adamczyk, Charles Werneth (*Univ of Tennessee*), Hanna Moussa (*Texas Tech University*), Jeremy Townsend (*Univ of Tennessee*), invited

Evaluation of Radiation Levels and Comparison with PHITS calculations for the BigRIPS Separator in Radioactive Isotope Beam Factory, Kanenobu Tanaka, Naohito Inabe, Koich Yoshida, Toshiyuki Kubo (*RIKEN Nishina Center*), invited

ENVIRONMENTAL SCIENCES: GENERAL

Sponsored by DESD

Session Organizer: Douglas A. Davis (*DESD Program Chair*)

U.S. Nuclear Regulatory Commission Technical Evaluation for the U.S. Department of Energy West Valley Waste Incidental to Reprocessing Determination, Leah Spradley-Parks, Nishka Devaser, Amy Hixon (*NRC*), Thomas Crandall (*Department of Energy*)

Development of Mechanistic Core Degradation Analysis Code and Plan for Validation Experiments Toward the Regulation of Fukushima Daiichi NPS, Tsuyoshi Okawa, Hiroshi Endo, Toshihisa Yamamoto, Tomoko Ishizu, Akitoshi Hotta, Harutaka Hoshi (*JNES*)

In-vessel Inspection Probing Technique Using Remote Imaging and Laser Spectroscopy, Chikara Ito, Akihiko Nishimura, Hironori Ohba, Ikuo Wakaida, Hiroyuki Naito, Akira Sugiyama, Keiji Chatani (*JAEA-Japan*)

Change of Corrosion Characteristics of SUS304L and Zircaloy-4 by an Immersion Test Under the Pre-Heat Treatment And Constant Potential, Shinichiro Yamashita, Masahiko Osaka (*JAEA-Japan*)

Neutron Background Variation with Altitude, John E. Gunning, Alexander L. Enders, Jeffery A. Chapman (*ORNL*), Glenn E. Sjoden (*Georgia Tech*)

Remediation of Uranium-Contaminated Concrete, Seung Soo Kim, Gye Nam Kim, Jei Kwon Moon (*KAERI-Korea*)

IMPLEMENTATION OF SUCCESSFUL NUCLEAR EDUCATION PROGRAMS IN THE UNITED STATES—PANEL

Sponsored by ETWDD

Session Organizer: Tanya Parwani-Jaimes (*NRC*)

The Energy Policy Act of 2005 authorized the NRC Nuclear Education Grant Program to support courses, studies, training, curricula, and disciplines pertaining to nuclear safety, security, and environmental protection. NRC's curriculum development grant program's primary purpose is supporting and developing the educational infrastructure necessary to allow the nation to safely advance its nuclear energy initiatives. This panel, composed of past and present NRC curriculum development grant recipients,

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

will describe the various curricula developed including impacts, benefits, collaborations, and successes that have resulted from this funding.

PANELISTS:

- Sama Bilbao y León (*Virginia Commonwealth Univ*)
- Jeremiah Kiran Billa (*Alcorn State Univ*)
- Daniel Cole (*Univ of Pittsburgh*)
- Cathleen McColgin (*Onondaga Community College*)

ENROLLMENT DIVERSITY AND NUCLEAR ENGINEERING—PANEL

Sponsored by ETWDD

Session Organizer: Lisa M. Marshall (*NCSU*)

This session will discuss the preparation of diverse student populations for the nuclear industry. Perspectives on starting and expanding programs will be discussed. How do you utilize human and financial capital to build a pipeline with other stakeholders? What is involved in pre-college through graduate school pipeline development for diverse enrollments? How has industry worked to attract and retain these talents? These papers/panelists will provide best practices and discuss challenges.

PANELISTS:

- Lisa M. Marshall (*South Carolina Universities Research & Education Foundation*)
- Ines Triay (*Florida International Univ*)
- R. Craig Williamson (*South Carolina Universities Research & Education Foundation*)
- Additional panelist to be determined

THERMAL-HYDRAULICS REACTOR ANALYST 2.0—PANEL

Sponsored by THD; cosponsored by YMG

Session Organizer: Elia Merzari (*ANL*)

DOE and other national and international research organizations are investing significant amounts of resources into updating or developing new tools for multi-physics analysis of nuclear reactor systems. Most of these new tools are based on radically different methods than traditional system analysis codes. This is particularly true in the area of thermal hydraulics, where for a number of years first principle-based approaches have started to be used in conjunction with or be coupled to traditional system codes. How will current and future trends change the profession of reactor analyst? How will this affect the skills needed to perform an analysis? Are the universities prepared for this paradigm shift? These are just a few of the questions we will address.

PANELISTS:

- Emilio Baglietto (*MIT*)
- David Pointer (*ORNL*)
- Vincent Mosseau (*SNL*)
- Nam Dinh (*NC State*)
- Yassin Hassan (*TAMU*)
- Chris Boyd (*NRC*)
- Tom Keheley (*AREVA*)
- Kurt Flaig (*Dominion*)

WEDNESDAY, NOVEMBER 13, 2013, 4:00 P.M.

NUCLEAR FISSION: 75-YEAR ANNIVERSARY—PANEL

Sponsored by RPD; cosponsored by MCD

Session Organizer: Piero Ravetto (*Politecnico di Torino-Italy*)

In December 1938, Otto Hahn and Fritz Strassmann reported that they had discovered the element barium after bombarding uranium with neutrons. Simultaneously, they communicated these results to Lise Meitner in Sweden. Meitner and Otto Frisch correctly interpreted Hahn's results to mean that the nucleus of uranium had split roughly in half. Frisch suggested the process be named "nuclear fission." The 2013 ANS Winter Meeting will celebrate the 75th anniversary of this occasion. The Reactor Physics Division will sponsor a panel session of distinguished speakers to commemorate this event, discussing the past, present, and future of fission as an energy source harnessed to serve mankind.

PANELISTS:

- to be determined

OPERATIONS AND POWER: GENERAL—II

Sponsored by OPD

Session Organizer: Belle R. Upadhyaya (*Univ of Tennessee*)

Demonstration of MHI RCP Seal Endurance under Station Blackout, Takashi Yamaguchi (*Mitsubishi Nuclear Energy Systems, Inc.*), Takeo Arai, Hitoshi Ito, Yasushi Takayama (*MHI*), Masanori Onozuka, Hiroshi Hamamoto (*MNES*)

Active Heat Removal System for Continuous Operation of the Missouri S&T Reactor, Carlos H. Castano, Arvind S. Kumar, Xin Liu, Ayodeji B. Alajo (*Missouri Univ Sci Technol*)

Thermodynamic Optimization of EM2 Plant with Organic Rankine Bottoming Cycle, Joshua Stone, Robert W. Schleicher (*General Atomics*)

Identification of "Additional" Systems to Withstand Beyond Design Basis Events, William H. Slagle, James Nygaard, Calvin Reid, Desmond Chan (*Bechtel*)

Preliminary Design of Power Conversion System for Small Modular Gas Cooled Reactor, Seong Jun Bae, Jeong Ik Lee, Yoonhan Ahn, Jekyoung Lee (*KAIST*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

Application of Mode-K Strategy to Daily Load-Follow Operation of OPR1000, Jiwon Choe, Minyong Park, Sooyoung Choi, Taewoo Tak, Deokjung Lee (*UNIST*)

ADVANCES IN AQUEOUS SEPARATION METHODS AND WASTE TREATMENT

Sponsored by FCWMD

Session Organizer: Jack D. Law (*INL*)

Impact of Advanced Nuclear Fuel Cycle Parameters on Radioactive Waste Classification Using the Fuel-Cycle Integration and Tradeoffs (FIT) Model, Denia Djokic (*Univ of California, Berkeley*), Steven J. Piet, Nick R. Soelberg, Layne Pincock (*INL*)

Advances in On-Line Spectroscopic Monitoring for Weak Acid Based Nuclear Fuel Reprocessing Schemes, Amanda Casella, Laura Hylden, Emily Valerio, James Peterson, Gregg Lumetta, Tatiana Levitskaia, Sam Bryan (*PNNL*)

Modeling of Cesium Trapping Reaction by Fly-ash Filter, Jang-Jin Park, Jae-Hwan Yang, Geun-Il Park, Jin-Myeong Shin, Yong-Hee Baek (*KAERI-Korea*)

Transmutation of Minor Actinides by Hydride Target, Kenji Konashi (*Tohoku Univ*), Tsugio Yokoyama (*Toshiba Nuclear Engineering Services Corp*)

Extending the Range of Organic Compounds Destroyed Using the Arvia™ Process, Nigel Brown (*Royal Society of Chemistry*)

COMPUTATIONAL THERMAL HYDRAULICS— III

Sponsored by THD

Session Organizer: Brian G. Woods (*Oregon State Univ*)

Transient Heat Transfer Analysis for SRS Radioactive Tank Operation, Si Y. Lee, Frank G. Smith (*SRNL*)

2-D FEM/1-D FDM Hybrid Method for Two-Temperature Homogenized Model in 3-D Transient Thermal Analysis of Prismatic Block Type VHTR Compact Fuel, Yoonhee Lee, Nam Zin Cho (*KAIST*)

Verification of Interface Source Terms in COSINE, Jun Chen, Hao Zhang, Zhaoguo Wu, Yanghua Yang (*The State Nuclear Power Software Development Center*)

Assessment of Cooling Tower Discharge Recirculation and Dispersion Using CFD Techniques, Sanjeeb Pal, Leonard J. Peltier, Andri Rizhakov, Michael P. Kinzel, Mallory Elbert, Kelly J. Knight (*Bechtel Systems & Infrastructure Inc.*)

Thermal Hydraulic Behavior in Lower Plenum of Chinshan Nuclear Power Plant Using Computational Fluid Dynamics, Yu-Ting Ku, Yung-Shin Tseng (*Tsinghua Univ*), Jong-Rong Wang (*INER*), Chunkuan Shih, Y. M. Ferng (*Natl Tsing Hua Univ*)

MATHEMATICAL MODELING: GENERAL

Sponsored by MCD

Session Organizer: Brian C. Franke (*SNL*)

A Linear Stability Analysis of a Three-Temperature Operator-Split System for Two-Temperature Radiation Packages, Allan B. Wollaber (*LANL*)

Characterization of Types of Inclusion Edge Effects in Finite Stochastic Materials, C. Russell Willis, Erich Schneider (*University of Texas at Austin*), David P. Griesheimer (*Bechtel Marine Propulsion Corporation*)

Benchmarking a Simulation of Sub-Critical Neutron Chains, Mathieu Wolton Brener (*Penn State*)

Sharp Fuel Assembly Coupled Simulation Demonstrations, Vijay S. Mahadevan, Elia Merzari, Rajeev Jain, Micheal A. Smith (*ANL*), Aleks Obabko, Timothy Tautges, Paul Fischer, W. David Pointer (*ORNL*), Bob Ferencz (*LLNL*)

Physics-Informed Surrogate Modeling for Reactor Transport Calculations, Congjian Wang, Hany S. Abdel-Khalik (*NCSU*)

ACCELERATOR APPLICATIONS: GENERAL

Sponsored by AAD

Session Organizer: Erich A. Schneider (*Univ of Texas, Austin*)

MCNP6 Study of Spallation Products from 500 MeV p + ¹³⁶Xe, Stepan G. Mashnik (*XCP-3, Los Alamos National Laboratory*)

Fission Fragments Produced from Proton Irradiation of Thorium between 40 and 200 MeV, Jonathan W. Engle (*LANL*), Stepan G. Mashnik (*XCP-3, Los Alamos National Laboratory*), Francois M. Nortier (*LANL*)

Breeding of U-233 by Neutron Irradiation of Th-232, Anthony Ross Pace, Patrick J. Pinhero, Matthew Bernards (*Univ of Missouri, Columbia*)

Accelerator-Based Neutron Damage Testing—High Energy Neutrons for Accelerated Material Qualification, Peter McIntyre, Pavel V. Tsvetkov, Saeed Assadi, Nathaniel Pogue, Ajhdiyor Sattarov (*Texas A&M*)

RESEARCH AT THE NRC

Sponsored by NISD

Session Organizer: Girija S. Shukla (*NRC*)

Technical Basis Development for Filtered Containment Venting System Requirements, Sudhamay Basu, Allen Notafrancesco (*NRC*), Kyle Ross, Jeff Cardoni (*SNL*), Edward Fuller, Richard Lee, Hossein Esmaili, Tina Ghosh (*NRC*)

BWR Anticipated Transients Without Scram Leading to Emergency Depressurization, Lap-Yan Cheng, Joo-Seok Baek, Arantxa Cuadra, Arnold Aronson, Diamond David (*BNL*), Peter Yarsky (*NRC*)

TRACE/PARCS Core Modeling of a BWR/5 for Accident Analysis of ATWS Events, Arantxa Cuadra, Lap-Yan Cheng, Joo-Seok Baek, Arnold Aronson, David Diamond (*BNL*), Peter Yarsky (*NRC*)

BWR Anticipated Transients Without Scram Leading to Instability, Lap-Yan Cheng, Joo-Seok Baek, Arantxa Cuadra, Arnold Aronson, David Diamond (*BNL*), Peter Yarsky (*NRC*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY

TRACE Model for Simulation of Anticipated Transients Without Scram in a BWR, Lap-Yan Cheng, Joo-Seok Baek, Arantxa Cuadra, Arnold Aronson, David Diamond (*BNL*), Peter Yarsky (*NRC*)

MODELING AND TRANSPORT OF RADIOACTIVE MATERIALS IN THE ENVIRONMENT

Sponsored by DESD

Session Organizer: Jay Peters (*Haley Aldrich*)

Preliminary Calculation of Sediment and ^{137}Cs Transport in the Ukedo River of Fukushima, Hiroshi Kurikami, Akihiro Kitamura, Masaaki Yamaguchi (*JAEA-Japan*), Yasuo Onishi (*PNNL*)

Simulating Long-Term ^{137}Cs Distribution on Territory of Fukushima, Akihiro Kitamura, Masaaki Yamaguchi, Yoshihiro Oda (*JAEA-Japan*), Hiroshi Kurikami, Yasuo Onishi (*PNNL*)

Computational Modeling of Radioactive Contaminants in Fukushima, Akihiro Kitamura, Masahiko Machida, Haruo Sato, Shinichi Nakayama, Mikazu Yui (*JAEA-Japan*)

Balancing Realism and Conservatism in Risk Assessment for LLW Repositories, David John LePoire, Sunita Kamboj, Charley Yu (*ANL*)

First-Principles Calculation Studies for Radioactive Cesium Adsorption to Clay Minerals, Masahiko Okumura, Hiroki Nakamura, Masahiko Machida (*JAEA-Japan*)

A Study on the Remediation of Radioactive Contaminated Soil, Sang Woon Kwon, Y. S. Choi, H. M. Yang, G. W. Lee, B. K. Seo, J. K. Moon (*KAERI-Korea*)

CUTTING EDGE TECHNIQUES IN EDUCATION, TRAINING, AND DISTANCE LEARNING

Sponsored by ETWDD

Session Organizer: John S. Bennion (*GE Hitachi Nuclear*)

The “My Amazing Future” Program at Idaho National Laboratory, Frances M. Marshall (*INL*)

Advanced Test Reactor National Scientific User Facility “New User” Experiment, Frances M. Marshall, A. Joe Palmer (*INL*)

Managing Nuclear Technology: An Experiment in Applying the Science: Systems: Society Educational Triad, Richard K. Lester, Aditi Verma (*MIT*)

A Virtual, Interactive, Multiplayer Radiation Laboratory, Imran J. Haddish (*Univ of Illinois*), Ye Li (*University of Illinois at Urban-Champaign*), Rizwan Uddin (*Univ of Illinois*)

A Field Survey Laboratory for a Course in Nuclear Instrumentation, Kenneth J. Dayman, Tracy Tipping, Steven R. Biegalski (*Univ of Texas, Austin*)

Bridging the Nuclear Generation Practical Training Gap, Ryan Christopher Schow, Tatjana Jevremovic (*Univ of Utah*)

GENERAL TWO-PHASE FLOW

Sponsored by THD

Session Organizer: Hisashi Ninokata (*Politecnico di Milano*)

Observations of Bubble Nucleation and Interaction Dynamics in High Heat Flux Boiling, Nam T. Dinh (*NCSU*), J. P. Tu (*Tulabs*)

Assessment of a Baseline Two Phase CFD Closure for PWR Applications, Koroush Shirvan, Emilio Baglietto, Mujid Kazimi (*MIT*)

Internal Structure and Void Fraction Profile Shape in Horizontal Bubbly Flow, Grazia Monni, Mario De Salve, Bruno Panella (*Politecnico di Torino-Italy*)

Numerical Simulation of Void Fraction in a Rod Bundle under Stagnant Liquid Condition, Michio Murase, Chihiro Yanagi (*Institute of Nuclear Safety System, Inc.*), Takashi Takata, Akira Yamaguchi (*Osaka Univ.*), Akio Tomiyama (*Kobe Univ.*)

Numerical Simulation of Annular Flow Using Volume of Fluid Method, Yang Liu, Heng Xiao (*Virginia Tech*)

A Fundamental Model for Predicting Bubble Size in Diabatic Multiphase Flows, Dillon R. Shaver, Michael Z. Podowski (*RPI*)

Lift Forces in Bubbly Flows, Thomas F. Daly (*Univ of Tennessee*), Sreekanth Pannala (*ORNL*), Arthur E. Ruggles (*Univ of Tennessee*)

DEVELOPMENTS AND APPLICATIONS OF NEUTRON BEAM TECHNIQUES

Sponsored by IRD

Session Organizer: Kenan Unlu (*Penn State*)

Use of Deuterium-Cluster Foils for an Intense Pulsed Neutron Source, George Miley (*Univ of Illinois, Urbana-Champaign*)

SIDecSo, A Simple Analytic Software for Neutron Depth Profiling, Matthew Scott Parsons (*Material Measurement Laboratory, NIST*), invited
NIST Neutron Depth Profiling Facility: 2013, R. Gregory Downing (*NIST*), invited

Preliminary Physics Analysis of GDT-based Neutron Source for Hybrid Application, Hongfei Du, Yican Wu (*Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences*)

INNOVATIONS IN RADIATION DETECTORS: NEW DESIGNS, IMPROVEMENTS, AND APPLICATIONS

Sponsored by IRD

Session Organizer: Igor Jovanovic (*Penn State*)

Novel Carbon Nanomaterial Radiation Sensors, Mark A. Pierson (*Virginia Tech*), Erik Dahl (*AREVA*), Christopher Kryworuk (*Bechtel*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: WEDNESDAY/THURSDAY

Measuring the Half-Life of ^{111m}Pd , Richard M. Lindstrom, Dagistan Sahin (*NIST*), invited

High Neutron Cross-Section Cladding Layers for Wide Bandgap Semiconductors, Gabriel Josiah Brown (*Univ of South Carolina*), MVS Chandrashekhar (*University of South Carolina*), T. Sudarshan (*Univ of South Carolina*)

THURSDAY, NOVEMBER 14, 2013

7:30 a.m. - 2:00 p.m. Meeting Registration

8:00 a.m. - 11:45 a.m. 2013 ANS Winter Meeting:
Technical Sessions

- Reactor Physics Design, Validation, and Operating Experience
- Advanced /Gen-IV Reactors—I
- Advanced Prompt Gamma Activation Analysis and Gamma Spectrometry
- Transport, Computational, Uncertainty Quantification, and Sensitivity Analysis Methods
- Uranium Recovery and Reclamation
- Research by U.S. DOE NEUP-Sponsored Students—I
- ANS 8 Standards Forum
- Experimental Thermal Hydraulics—III

1:00 p.m. - 5:00 p.m. 2013 ANS Winter Meeting:
Technical Sessions

- Physics of Compact Reactors for Terrestrial and Space Applications
- Advanced /Gen-IV Reactors—II
- Reactor Systems and Advanced Measurement Techniques
- Making Ethics Real in Nuclear Engineering—Panel
- Research by U.S. DOE NEUP-Sponsored Students—II
- Data and Analysis in Nuclear Criticality Safety—III
- Thermal Hydraulics: General—II

THURSDAY, NOVEMBER 14, 2013, 8:00 A.M.

REACTOR PHYSICS DESIGN, VALIDATION, AND OPERATING EXPERIENCE

Sponsored by RPD

Session Organizer: Alexander Stanculescu (*INL*)

Validation of Fuel Burnup for the NRU Research Reactor, Timothy Chung, Tim Leung (*AECL*)

Validation of Burnup Calculation Function in RMC using Takahama-3 Benchmark, Xubo Ma, Bin Gao, Yixue Chen (*North China Electric Power University*), Hui Yu (*State Nuclear Power Softer Development Center*)

A Complex-Geometry Validation Experiment for Advanced Neutron Transport Codes, David W. Nigg, Anthony W. LaPorta, Joseph W. Nielsen, James R. Parry, Mark D. DeHart, Samuel E. Bays, William F. Skerjanc (*INL*)

Benchmarking of Depletion Calculations for LWR Fuel Assemblies using $\text{ThO}_2\text{-UO}_2$ pins and TRU FCM pins, Ser Gi Hong, Do Yeon Kim, Hae Lee Hyun, Gonngphoon Bae (*Kyung Hee Univ*), Ho Jin Park (*KAERI-Korea*)

Effects of the Burnable Poison Particles in LWR Fuel Assemblies Using $\text{ThO}_2\text{-UO}_2$ pins and TRU FCM Pins, Ser Gi Hong, Gonngphoon Bae (*Kyung Hee Univ*)

Study on the Conversion Capability of Molten Salt Reactors, Juan Luis Francois (*Facultad de Ingenieria/UNAM*), Faviola B. Garcia-Barron (*UNAM*)

Evaluation of Anomalous TMI-1 Radiochemical Assays, Brian E. Mays (*AREVA Federal Services LLC*), Claude W. Mays [*AREVA (Retired)*], Joseph J. Sapyta [*B&W (retired)*]

Burnup Code Development and Core Design of TWR, Wei Sun (*Tsinghua Univ*)

Kinetics Parameters of a Th-Pu Re-Entrant-Channel Pressure-Tube SCWR, Eleodor Nichita (*Univ of Ontario Inst of Tech*)

Neutronic Analysis of Candidate Accident-Tolerant Iron Alloy Cladding Concepts, Nathan M. George (*Univ of Tennessee*)

ADVANCED /GEN-IV REACTORS—I

Sponsored by OPD

Session Organizer: William Arthur Wharton, III (*Westinghouse STD*)

Optimum Double Wall Heat Exchanger for Containment and Trapping of Tritium in a Salt-Cooled Reactor, Lindsey Gilman, Charles Forsberg (*MIT*)

External Breakthrough Technologies for Salt-Cooled Reactors, Charles W. Forsberg (*MIT*)

Purification of Non Uranium Bearing Fluoride Salts for Nuclear Applications, Brian Christopher Kelleher (*Univ of Wisconsin, Madison*)

Goals and Licensing Strategy for a Fluoride Salt-Cooled High Temperature Test Reactor (FHTR), Lin-Wen Hu, Charles Forsberg (*MIT*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: THURSDAY

Commercialization Approaches and Challenges for Fluoride-Salt-Cooled High-Temperature Reactors (FHRs), Charles W. Forsberg (MIT)

Safety Analysis of a Super Fast Reactor with Single Flow Pass Core, Sutanto Sutanto, Yoshiaki Oka (*Waseda University*)

Investigation of Sodium-Cooled Fast Reactor Active Control for Use with the Supercritical Carbon Dioxide Brayton Cycle, Anton Moiseyev, James J. Sienicki (ANL)

Trace Elemental Analysis of Flibe by Neutron Activation Analysis in Support of FHR Research, Lin-wen Hu, Michael R. Ames (MIT)

ADVANCED PROMPT GAMMA ACTIVATION ANALYSIS AND GAMMA SPECTROMETRY

Sponsored by BMD; cosponsored by IRD
Session Organizer: Rick L. Paul (NIST)

Development of Prompt Gamma-Ray Analysis Using Guided Neutrons at JRR-3, Mitsuru Ebihara, Mohammad Amirul Islam (*Tokyo Metropolitan University*), Yosuke Toh, Hideo Harada (JAEA-Japan), invited

A New NIST Instrument for Cold Neutron Prompt Gamma-Ray Activation Analysis, Rick L. Paul, Christoph Brocker, Jeremy C. Cook, Richard M. Lindstrom (NIST), invited

Characterization of Smithsonian Institution's Building Stones and Brick by PGNA, Richard Allan Livingston, Mohamad Al-Sheikhly (*Univ of Maryland*), Carol Grissom, Emily Aloiz (*Smithsonian Institution*), Rick Paul (NIST)

A Multivariate Deconvolution Approach to Rapid Radionuclide Screening/Semiquantitative Analysis, John M. Ondov (*Univ of Maryland*), Gregory M. Beachley (US EPA), Bryan E. Tomlin (NIST), invited

Development of Prompt Gamma-ray Analysis Using Spallation Neutrons at J-PARC, Yosuke Toh (JAEA-Japan), Mitsuru Ebihara (*Tokyo Metropolitan University*), Hideo Harada (JAEA-Japan), invited

Applying Method of Integral Thermal Neutron Cross-Section Measurement Using Activated Prompt Gamma Rays to Non-1/V Isotopes, Danyal Jacob Turkoglu (*Ohio State*), Sam Glover (NIOSH), Henry B. Spitz (*Univ of Cincinnati*), Lei Cao (*Ohio State*), invited

The Design Considerations of a Prototype MPGA System at NIST, Dagistan Sahin (NIST), invited

On the Determination of Carbon by PGAA, Rolf L. Zeisler, Rick Paul, Jeffrey Fagan (NIST), Zsolt Révay, Stefan Söllradl (*Technische Universität München, Forschungsneutronenquelle Heinz Maier-Leibnitz (FRM II)*), invited

TRANSPORT, COMPUTATIONAL, UNCERTAINTY QUANTIFICATION, AND SENSITIVITY ANALYSIS METHODS

Sponsored by MCD
Session Organizer: Brian C. Franke (SNL)

Improved Differential Evolution Implementation for Solving Inverse Transport Problems, Keith C. Bledsoe (*Univ of Pittsburgh*), Jeffrey A. Favorite (LANL)

Stabilized Finite Element Schemes for Consistent Discretization of Neutron Transport Equation, Vijay S. Mahadevan, Micheal A. Smith (ANL)

Streaming Nodal Sweeping Scheme for PWR Pin-by-pin Calculation, Yunzhao Li, Hongchun Wu, Liangzhi Cao, Youqi Zheng (*Xi'an Jiaotong Univ*)

A Modal Expansion Equilibrium Cycle Perturbation Method for Optimizing Fast Reactors, Nicholas W. Touran (*TerraPower LLC*), John C. Lee (*Univ of Michigan*)

On the Fuel Escape Probability Approximation of Equivalence Theory, Sooyoung Choi, Deokjung Lee (UNIST)

Modeling Spatial Dependence of Resonance Self-shielding Effects Including Resonance Interference and Temperature Distribution, Yuxuan Liu, William R. Martin (*Univ of Michigan*), Mark L. Williams, Kang Seog Kim (ORNL)

The Effect of Implicit Self-Shielding on the Inverse Sensitivity/Uncertainty Method for Thermal Reactors, Bassam Abdullah Khuwaileh (NCSU), Goran Arbanas, Mark Williams, Luiz C. Leal, Michael E. Dunn (ORNL), Hany S. Abdel-khalik (NCSU)

Integral Benchmark Experiments in the Inverse Sensitivity/Uncertainty Computations for Thermal Reactors, Bassam Abdullah Khuwaileh (NCSU), Goran Arbanas, Mark Williams, Luiz C. Leal, Michael E. Dunn (ORNL), Hany S. Abdel-khalik (NCSU)

An Analogue Monte Carlo Eigenvalue Problem Formulation with Neutron Multiplicative Reactions Included into the Neutron Transport Kernel, Hyungjin Shim, Sung Hoon Choi, Chang Hyo Kim (*Seoul Natl Univ-Korea*)

URANIUM RECOVERY AND RECLAMATION

Sponsored by DESD
Session Organizer: James Clarke (*Vanderbilt University*)

This session will explore both the environmental issues and technical challenges currently impacting uranium mines. Topics will include the decontamination of soils, sediment, and groundwater. Topics will also include current technologies that are in place to ensure that future mining efforts are protective of the environment and account for future decontamination and realization.

Uranium Recovery, Bill von Till (NRC)

Decommissioning and Uranium Recovery, Drew Persinko (NRC)

DOE Legacy Management, Jody Waugh (DOE)

Issues for Long-Term Containment of Residuals from Uranium Refining, Craig Benson (*Univ of Wisconsin*)

RESEARCH BY U.S. DOE NEUP-SPONSORED

STUDENTS—I

Sponsored by ETWDD

Session Organizer: Gregory A. Bala (INL)

Simulations of Multiplicity Distributions with Perturbations to Nuclear Data, Simon R. Bolding (*Texas A&M*), C. J. Solomon (*LANL*)

1-D Inverse Heat Flux Estimation using Least Square Method for MASLWR Test Facility, Dongyoung Lee, Qiao Wu (*Oregon State Univ*)

Investigation of 2LiF-BeF_2 (Flibe): Salt Transfer, Corrosion Tests and Characterization, Guiqu Zheng, Brian Kelleher, Guoping Cao, Kumar Sridharan, Mark Anderson (*Univ of Wisconsin-Madison*), Todd Allen (INL)

A Comparison of Various Clustering Schemes for Proliferation Resistance Measures, Zachary K. Jankovsky, Daniya Zamalieva, Richard S. Denning, Alper Yilmaz, Tunc Aldemir (*Ohio State*)

Chemical Detection in Flowing Molten LiCl-KCl Salt via Laser-Induced Breakdown Spectroscopy, Ammon Ned Williams, Supathorn Phongikaroon (*Univ of Idaho*)

Sintering Behavior of UO_2 -Diamond Composite Fuel Pellets using SPS, Danny Permar, Zhichao Chen (*Univ of Florida*)

Dynamic Response Analysis of a Scaled-Down Offset Strip-Fin Intermediate Heat Exchanger, Minghui Chen, In Hun Kim, Xiaodong Sun, Richard Christensen (*Ohio State*), Nathan R. Bartel, Vivek P. Utgikar (*Univ of Idaho*), Piyush Sabharwall (INL)

Lifecycle Prognostic Algorithm Development Using Bayesian Statistics, Alan Y. Nam, Michael Sharp (*University of Tennessee Knoxville*), J. Wesley Hines, Belle R. Upadhyaya (*Univ of Tennessee*)

Development of a Method for Monitoring Pump Parameters in Small Modular Reactors Using Motor Signatures, Belle R. Upadhyaya, Chaitanya Mehta, Victor B. Lollar, J. Wesley Hines (*Univ of Tennessee*), Duygu Bayram (*Istanbul Tech Univ*)

X-ray Attenuation Method for the Measurement of Void Fraction in a Cylindrical Test Section, Darius D. Lisowski, Mark H. Anderson, Michael L. Corradini (*Univ of Wisconsin, Madison*)

Development of Cylindrical Sources For Testing the Accuracy of Radioactivity Measurements in Nuclear Medicine Imaging, Matthew M. Mille (RPI), Brian Zimmerman (NIST), X. George Xu (RPI)

ANS 8 STANDARDS FORUM

Sponsored by NCSD

Session Organizer: Thomas P. McLaughlin (*Univ of Pittsburgh*)

- Speakers to be determined.

EXPERIMENTAL THERMAL HYDRAULICS—III

Sponsored by THD

Session Organizer: Seungjin Kim (*Penn State*)

Heat Removal Characteristics by Water Injection over Upper Crust during MCCI, Jun Sugimoto, Ayumu Nishida (*Kyoto Univ*)

A Simultaneous Observation of Vapor Bubbles and Heat Transfer Characteristics in the Subcooled Boiling Flow, Junsoo Yoo, Carlos E. Estrada-Perez, Yassin A. Hassan (*Texas A&M*)

CCFL at the Lower End of a Vertical Pipe, Yuki Fujii, Taiga Doi (*Kobe Univ*), Michio Murase (*Institute of Nuclear Safety System, Inc.*), Shigeo Hosokawa, Akio Tomiyama (*Kobe Univ*)

Overview of NuScale Testing Programs, Adam R. Rasmussen, Eric Young, Robert Houser (*NuScale Power*)

The Experiment of an Inclined Single-Tube Condensation for Passive Auxiliary Feedwater System of APR+, Chang Wook Shin, HeeCheon No (KAIST), Bong Yo Yun (KHNP), Byong Guk Jeon (KAIST)

Design of a Compact Integral Effects Test Facility for Fluoride-Salt-Cooled, High-Temperature Reactors, Nicolas Zweibaum, Raluca O. Scarlat, Per F. Peterson (*Univ of California, Berkeley*)

Chemical Reactivity of a Molten Salt with Coke, Ian W. Jentz (*University of Wisconsin- Madison*), Mark H. Anderson (*Univ of Wisconsin, Madison*), Richard Pollard (*Shell International Exploration and Production*)

Directional DRACS Heat Exchanger Concepts for the FHR, Joel T. Hughes, Seung-Jun Kim, Patrick O'Rourke, Edward D. Blandford (*Univ of New Mexico*)

Wavelet Analysis of Complex Coolant Flow Behavior in Fuel Gaps of a Pebble Bed Reactor, Noushin Amini, Yassin A. Hassan (*Texas A&M*)

Characteristics of Flow and Convective Heat Transfer in a Packed Pebble-Bed Reactor, Rahman Shnain Abdulmohsin, Muthanna H. Al-Dahhan (*Missouri Univ Sci Tech*)

THURSDAY, NOVEMBER 14, 2013, 1:00 P.M.

PHYSICS OF COMPACT REACTORS FOR TERRESTRIAL AND SPACE APPLICATIONS

Sponsored by RPD; cosponsored by ANSTD

Session Organizer: Shannon M. Bragg-Sitton (INL)

Benchmark Evaluation of HTR-PROTEUS Absorber Rod Worths (Cores 9 and 10), John Darrell Bess (INL)

Utility of the KUCA-Er Benchmark to Address Erbium Sensitivities in the NRAD Reactor, John Darrell Bess (INL)

Initial Neutronic Viability of a "TRIGA-Style" Isotope Production Reactor Fueled Solely with Molybdenum-99 Targets, Andrew John Hummel, Todd S. Palmer (*Oregon State Univ*)

Reactor Physics Performance of a Sub-100 kWe Terrestrial Surface Reactor, Jacob D. DeWitte (MIT)

Validation of UCFR-100 Depletion with Comparing Deterministic and Probabilistic Method, Taewoo Tak, Deokjung Lee (UNIST)

WINTER MEETING TECHNICAL SESSIONS BY DAY: THURSDAY

Optimization of Excess Reactivity and Power Profile in a Linear Breed-and-Burn Fast Reactor, Donny Hartanto, Yonghee Kim (*KAIST*)

A Kinetics Calculation of the Energy Multiplier Module (EM2), Hangbok Choi (*General Atomics*)

Analysis of Nuclear Thermal Rocket Reactors for a Range of Payloads, Satira I. Labib, Jeffrey C. King (*CSM*)

Integrated Solid-State Nuclear Pumped Laser/Reactor Design for Asteroid Redirection, Matthew L. Watermann, Mark A. Prelas (*Univ of Missouri, Columbia*)

Compact Nuclear-Driven Process Heat Supply—Core Arrangement, Pavel V. Tsvetkov (*Texas A&M*)

ADVANCED /GEN-IV REACTORS—II

Sponsored by OPD

Session Organizer: Thomas A. Remick (*Southern California Edison*)

Single Pass Core Design of Super LWR, Jianhui Wu, Yoshiaki Oka (*Waseda Univ*)

Restoration for Damaged Components in Reactor Vessel of the Experimental Fast Reactor Joyo, Chikara Ito, Misao Takamatsu, Hideaki Itoh, Akinori Nagai, Akihiro Yoshida, Hideo Sakaba, Yukimoto Maeda (*JAEA-Japan*)

Nickel Catalyst Activity and Hybrid Decomposer Design for HI Process of SI Cycle, Jinyoung Choi, Hee C. No (*KAIST*)

Preliminary Studies of Two Fluids Heat Exchangers for S-CO₂ Power Conversion Cycle Coupled to SFR, Hwa-Young Jung, Jeong Ik Lee (*KAIST*), Myung-Hwan Wi, Jae-Hyuk Eoh, Sang-Min Park (*KAERI-Korea*), Yoonhan Ahn (*KAIST*)

Performance and Transient Analysis of WHEN (Water-Hydrogen-Electricity Nuclear) System, Ho Sik Kim, Hee Cheon No (*KAIST*), Hyung Gon Jin (*KAERI-Korea*)

Integral Inherently Safe Light Water Reactor (I₂S-LWR) - Concept Overview, Bojan Petrovic (*Georgia Tech*)

3D Mapping and Reconstruction for In-Core Monitoring in Advanced Reactors, Pavel Tsvetkov (*Texas A&M*)

Energy Mix Grid Aggregation Analysis, Pavel Tsvetkov (*Texas A&M*)

REACTOR SYSTEMS AND ADVANCED MEASUREMENT TECHNIQUES

Sponsored by MSTD

Session Organizer: Kenneth J. Geelhood (*PNNL*)

Preliminary Fission Product Behavior in the Fluoride Salt-Cooled High-Temperature Reactor, John Stempien, Ronald G. Ballinger, Charles W. Forsberg (*MIT*)

Uncertainty Quantification of Calculated Temperatures for AGR Experiments, Binh T. Pham, Jeffrey J. Einerson (*INL*)

Fuel Performance Modeling for the Fluoride Salt-Cooled High-Temperature Reactor, John Stempien, Ronald G. Ballinger, Charles W. Forsberg (*MIT*)

Development of a Radiolysis Model for PWR Primary Water Chemistry, Jennifer A. Jarvis, Ronald G. Ballinger (*MIT*)

Nonlinear Sliding Evaluation of Nuclear Power Plant Structures, Takanori Ogata (*MHI*), Hiyoyuki Fuyama, Kyosuke Kamito (*Mitsubishi Heavy Industries, Ltd.*), Masanori Onozuka (*Mitsubishi Nuclear Energy Systems, Inc.*), Radu Popescu, Michael McKenna (*URS Corporation*)

Large-Scale Tests of Steel Concrete Structures for US-APWR Containment Internal Structure, Masanori Onozuka, Takanori Ogata (*Mitsubishi Nuclear Energy Systems, Inc.*), Hiroyuki Fuyama, Ryo Fujimoto, Tomoyuki Kitani (*Mitsubishi Heavy Industries, Ltd.*), Matthew Van Liew, Derek Winkler (*URS Corporation*), Amit H. Varma (*Purdue Univ*)

Thermal Wave Techniques for Thermophysical Properties Characterization for Ion-Irradiation Studies, Colby B. Jensen (*Utah State University/Universite de Reims Champagne-Ardenne*), Mihai Chirtoc, Nicolas Horny, Jean-Stephane Antoniow, Herve Pron (*Universite de Reims Champagne-Ardenne*), Heng Ban (*Utah State Univ*)

Frequency Scanning Thermal Diffusivity Measurement Technique, Zilong Hua, Heng Ban (*Utah State Univ*)

Tensile Behavior of Inconel 617 vs. Haynes 230: Effects of Temperature and Strain Rate, Djamel Kaoumi, Kyle Hrutkay (*Univ of South Carolina*)

MAKING ETHICS REAL IN NUCLEAR ENGINEERING-PANEL

Sponsored by RPSD

Session Organizer: Robert B. Hayes (*Nuclear Waste Partnership, LLC*)

Ethics by Example from Management, Donald Hoffman (*ANS President, EXCEL*)

Ethics When Nobody is Watching, Edward (Ted) Quinn (*Technology Resources*)

Ethics and Safety, Mikey Brady Raap (*President-Elect, PNNL*)

Improving Ethics in Employees, Scott Bowman (*GE Hitachi*)

Ethics in the Workplace, Mark Peres (*Flour*)

Some Engineering Ethics Cases and Their Resolution by NSPE Judges, Nicholas Tsoulfanidis (*UNR, Nuclear Technology*)

Overcoming Fear to Behave Ethically, Peter Caracappa (*RPI*)

Ethics Expectations from the Public, Vic Uotinen (*Past ANS ethics chair*)

Ethics in Commerce and Procurement, Tim Martinson (*Canberra*)

Ethics Everywhere Always, Kevan Weaver (*TerraPower*)

RESEARCH BY U.S. DOE NEUP-SPONSORED STUDENTS—II

Sponsored by ETWDD

Session Organizer: Gregory A. Bala (*INL*)

WINTER MEETING TECHNICAL SESSIONS BY DAY: THURSDAY

Three-Dimensional Modeling of the Pebble-Bed Fluoride-Salt-Cooled, High-Temperature Reactor (PB-FHR) Commercial Plant Design, David L. Krumwiede, Raluca O. Scarlat, Jae Keun Choi, Tung M. Phan, Per F. Peterson (*Univ of California, Berkeley*)

Transient Model of Wavy-Channel Printed Circuit Heat Exchangers, Nathan R. Bartel, Vivek P. Utgikar (*Univ of Idaho*), Piyush Sabharwall (*INL*), Minghui Chen, Xiaodong Sun, Richard Christensen, In Hun Kim (*Ohio State*)

Thermoelectrically Powered Sensing for Nuclear Power Plants, Mahder Tewolde, Chih Chieh Lin, Hanfei Chen, He Tao, Gaosheng Fu, Di Liu, Tao Zhang, Chao Nie, Weixiao Zheng, Fan Liu, David Benjamin, Lei Zuo, David Hwang, Jon Longtin (*Stony Brook University*), invited

Characterization of ^{14}C in Neutron-Irradiated NBG-25 Graphite, Daniel P. LaBrier, Mary Lou Dunzik-Gougar (*Idaho State Univ*)

Simulation of the Flow of Supercritical Carbon Dioxide through Circular and Annular Orifices, Haomin Yuan, Mark H. Anderson, John Dyreby, John Edlebeck, Matthew Wolf (*Univ of Wisconsin, Madison*)

Improved Accident Tolerance of Austenitic Stainless Steel Cladding through Colossal Supersaturation with Interstitial Solutes, Zhen Li, Frank Ernst, Arthur H. Heuer (*Case Western Reserve Univ*), invited

A Map View Concept for Cyclus Input Control, Urairisa Birdy Phathanapirom, Erich Schneider (*Univ of Texas, Austin*), Anthony Scopatz (*University of Chicago*), Robert Flanagan (*Univ of Texas, Austin*)

Thermophysical Property Characterization of Nuclear Materials, Colby B. Jensen (*Utah State University/Universite de Reims Champagne-Ardenne*), Heng Ban (*Utah State Univ*), Mihai Chirtoc (*Universite de Reims Champagne-Ardenne*)

Network Distribution Effects on a Steam Generator Level Control System, Michael C. Pietrykowski, Qingti Guo, Carol Smidts (*Ohio State*)

On the Effects of Containment Design to GT-MHR Air-Ingress Accidents, Tae K. Ham, David J. Arcilesi, In H. Kim, Xiaodong Sun, Richard N. Christensen (*Ohio State*), Chang H. Oh (*INL*)

DATA AND ANALYSIS IN NUCLEAR CRITICALITY

SAFETY—III

Sponsored by NCSD

Session Organizer: Allison D. Miller (*SNL*)

Generation of 1800 New Sensitivity Data Files for ICSBEP Using SCALE6.0, Ian Hill (*OECD-NEA*), Nigel (Jim) T. Gulliford (*OECD/Nuclear Energy Agency*), J. Blair Briggs (*INL*), Bradley T. Rearden (*ORNL*), Tatiana Ivanova (*IRSN*)

Verification of MCNP5-1.60 and MCNP6.1 for Criticality Safety Applications, Forrest B. Brown, Brian C. Kiedrowski, Jeffrey S. Bull (*LANL*)

Comparison of ENDF71x and ENDF70 Using ICSBEP Criticality Benchmarks in MCNP6, Steven James Gardiner, Jeremy L. Conlin, Albert C. Kahler, D. Kent Parsons (*LANL*)

Revision to ANS-8.1 “Nuclear Criticality Safety in Operations with Fissionable Material Outside of Reactors,” Doug Bowen (*LANL*), Nicholas W. Brown (*Nuclear Fuel Services, Inc.*)

Radiochemical Processing Laboratory Building-Wide Flooding Event, Andrew W. Prichard (*PNNL*)

Completion of the De-Inventory Program at Lawrence Livermore National Laboratory, Debidas Biswas, David Riley (*LLNL*)

Integrated Approach to Documenting Readiness for a Potential Criticality Incident, Bruce Scott Carlisle, A.W. Prichard, R.A. Jones (*PNNL*)

Energy Release in Criticality Accidents Involving Two Fuel Solution Tanks, Toru Obara, Haruka Kikuchi (*Tokyo Inst Technol*)

THERMAL HYDRAULICS: GENERAL—II

Sponsored by THD

Session Organizer: Fatih Aydogan (*Univ of Idaho*)

Thermal Conductivity Degradation Effect on LBLOCA analysis, Seung Hun Yoo, Byung Gil Huh, Hyedong Jeong, Dong-Gu Kang, Chae-Yong Yang, Kwang-Won Seul (*KINS-Korea*)

Measurements and Modeling of the Flow of Supercritical Carbon Dioxide through Orifices and Annuli, Matthew P. Wolf, Haomin Yuan, John Edlebeck (*UW-Madison Mechanical Engineering*)

Fuel Temperature Prediction in the Coolant Channel Blockage Case of VHTR, Sung Nam Lee, Nam-il Tak, Min Hwan Kim, Jae Man Noh (*KAERI-Korea*)

Thermal Radiation Heat Transfer Analysis for High Temperature Steam, Paul J. Marotta (*nuExergy, LLC*), Trevor M. Moeller, Basil N. Antar (*University of Tennessee Space Institute*), Arthur E. Ruggles (*University of Tennessee*)

The Design Analysis of Passive Containment Cooling System for PWR, Jae Young Choi, Sang Ho Kim, Soon Heung Chang (*KAIST*)

Stability Analysis of a Natural Circulation Lead-Cooled Fast Reactor, Qiyue Lu (*Univ of Illinois Urbana Champaign*), Rizwan Uddin (*Univ of Illinois*)

Comparison of NRELAP5 to ORNL and NuScale Critical Heat Flux Tests, D. Scott Lucas (*NuScale Power*)

Transient Analysis in a Supercritical Water Reactor Concept with Multiple Heat-Up Steps, Juan Luis Francois (*Facultad de Ingenieria/UNAM*), Cecilia Martin-Del-Campo (*Univ. Nacional Autonoma De Mexico*), Gilberto Espinoza-Paredes (*Universidad Autónoma Metropolitana-Iztapalapa*), Alejandra Barragan-Martinez (*UNAM*), Alejandro Vazquez-Rodriguez (*Universidad Autónoma Metropolitana-Iztapalapa*)

TRACE Analysis of Spent Fuel Pool Loss-of-Coolant Accidents, Hui-Chen Wang (*Natl Tsing Hua Univ*), Jong-Rong Wang, Hao-Tzu Lin (*INER*), Chunkuan Shih (*Natl Tsing Hua Univ*)

Embedded Topical Meeting: Risk Management for Complex Socio-Technical Systems



HONORARY CHAIR:
George Apostolakis
U.S. Nuclear Regulatory Commission



GENERAL CHAIR:
Ronald A. Knief
Sandia National Laboratories



**TECHNICAL PROGRAM
CO-CHAIR**
Zahra Mohaghegh
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**TECHNICAL PROGRAM
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University of Maryland



DEPUTY PROGRAM CO-CHAIR:
Kevin A. Coyne
U.S. Nuclear Regulatory Commission

DEPUTY PROGRAM CO-CHAIR:
Rick Grantom
*South Texas Project
Nuclear Operating Company*

DEPUTY PROGRAM CO-CHAIR:
Reza Kazemi
*U.S. Food and Drug
Administration*

TUESDAY, NOVEMBER 12, 2013

- 7:30 a.m. - 5:00 p.m. Meeting Registration
- 8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality
- 8:00 a.m. - 11:30 a.m. 2013 Risk Management:
Open Plenary
"Risk-Informed Decision Making"
- 1:00 p.m. - 6:05 p.m. 2013 Risk Management:
Technical Sessions
- Risk Management Approaches in the Post-Macondo Offshore Industry
 - Influences of Organizational Factors and Safety Culture on Risk of Technical Systems
 - Digital I&C and Cyber Security
 - Risk Management for Cyber Security and Digital I&C

TUESDAY, NOVEMBER 12, 2013, 8:00 A.M.

OPENING PLENARY ON RISK-INFORMED DECISION MAKING

Sponsored by NISD

Session Organizer: Zahra Mohaghegh (*Univ of Illinois*)

The genesis of Probabilistic Risk Assessment (PRA) was the landmark Reactor Safety Study published in 1975. Since then, PRA has grown into a well-established technical discipline with a wide range of applications. PRA can provide input for risk-

informed decision making for the design, operation, and regulatory oversight of complex socio-technical systems. Despite significant methodological advancements, new tools and techniques for PRA are needed. On this panel, experts from the nuclear regulatory agency, academia, and industry will share their experiences and opinions on the: (1) importance of PRA insights for regulatory actions, (2) effective utilization of PRA tools for risk-informed activities, (3) advanced techniques to improve the adequacy and efficacy of PRA, and (4) state-of-the-art applications of PRA for the resolution of long-lasting industry safety issues.

PANELISTS:

- Ronald Knief (*SNL*), Opening Remarks
- Zahra Mohaghegh (*Assistant Professor, Dept. of Nuclear, Plasma, and Radiological Eng., Univ of Illinois at Urbana-Champaign*), Technical Program Overview
- George Apostolakis (*Commissioner, NRC*), Risk Management at the U.S. NRC
- Doug Coe (*Deputy Director, Division of Risk Analysis, Office of Nuclear Regulatory Research, NRC*), Risk-Informed Thinking—A Regulator's Perspective
- Ali Mosleh (*Professor, Center for Risk and Reliability, Univ of Maryland*), Improving Utility and Credibility of PRA Through Methodological Advancements
- Antoine Rauzy (*Professor, Ecole Polytechnique*), PRA/PSA: Can We Improve the Engineering of Models?
- Rick Grantom (*Manager, South Texas Project Nuclear Operating Company*), Use of Risk-Informed GSI-191 Methodology for Other Complex Problems

TUESDAY, NOVEMBER 12, 2013, 1:00 P.M.

RISK MANAGEMENT APPROACHES IN THE POST-MACONDO OFFSHORE INDUSTRY

Sponsored by NISD

Session Organizer: William R. Nelson (*Det Norske Veritas*)

Challenges for Risk Management Approaches in the Offshore Industry in the Modelling of Human & Organizational Factors' Influence on Risk, Jan-Erik Vinnem (*NTNU*)

A Risk Analysis Study to Assess the Critical Role of Human and Organizational Factors in Offshore Drilling, Maryam Tabibzadeh, Najmedin Meshkati (*Univ of Southern California*)

Risk Management Models in an Integrated Operations Context, Nicola Paltrinieri, Stein Hauge (*SINTEF Technology and Society*), Eirik Albrechtsen (*Norwegian Univ Sci Tech*)

Integrated Operations Methods for Risk Management to Prevent Major Accidents, Bill Nelson (*Det Norske Veritas*)

INFLUENCES OF ORGANIZATIONAL FACTORS AND SAFETY CULTURE ON RISK OF TECHNICAL SYSTEMS—PANEL

Sponsored by NISD

Session Organizer: Justin T. Pence (*ANL*)

We have witnessed the gaps in safety culture and organizational factors as significant risk contributors to many major accidents, such as Three Mile Island and Chernobyl and the recent disasters at Fukushima and the Macondo well in the Gulf of Mexico. However, there has not yet been any consensus among industry, academia, and regulatory organizations regarding the best approaches to assess safety culture and how to model its impact on technical systems risk. This panel will discuss these challenges and current approaches.

Current Probabilistic Risk Analysis (PRA) models are incapable of “explicitly” covering organizational factors and, therefore, currently: (1) it is not possible to assess the risk due to the specific organizational status of technological systems, (2) it is not feasible to locate the organizational root causes of failures to take effective corrective actions, and (3) there is the possibility of underestimating risk.

By incorporating organizational factors into risk frameworks, we can provide more accurate predictions of organizational performances and, in certain cases, relate those to the probabilities for some of the basic events of PRA. Consequently, this will lead to more realistic estimate of system risk and enable management to provide additional and timely provisions for key equipment and functions supporting long-term safe and reliable operations.

PANELISTS:

- Tim Bedford (*Univ of Strathclyde Glasgow*)
- Earl Carnes (*DOE*)
- David Hofmann (*Univ of North Carolina*)
- Ronald Knief (*SNL*)
- Najmedin Meshkati (*Univ of Southern California*)
- Stephanie Morrow (*NRC*)
- Undine Shoop (*NRC*)

DIGITAL I&C AND CYBER SECURITY

Sponsored by NISD

Session Organizer: Rizwan Uddin (*Univ of Illinois*)

Modeling and Analysis of Dependent Failures in Cyber-Physical Systems, Koosha Marashi, Mark Woodard, Sahra Sedigh, Ali Hurson (*Missouri Univ Sci Tech*)

Part 1: Good things in Small Packages: Micro worlds and Cyber Security, David I. Gertman (*INL*)

An Explanatory Model of Cyber-Attacks Drawn from Rational Choice Theory, Seymour Mordechai Mandelcorn, Mohammad Modarres, Ali Mosleh (*Univ of Maryland*)

Security Risk: A Brief History and New Risk Management Approach, Felicia Angelica Duran, Gregory D. Wyss, Joseph S. Sandoval (*SNL*)

Digital I&C and Cyber Security in Nuclear Power Plants, Yongkyu An, Rizwan Uddin, William Sanders (*Univ of Illinois*)

Leveraging a Model-Driven Design/Development Approach to Mitigate Risk in Safety-Critical Projects, Ben Amaba, Graham Bleakley, Bruce Douglass, Paul Fechtelkotter, Irfan Irving Badr (*IBM*)

RISK MANAGEMENT FOR CYBER SECURITY AND DIGITAL I&C—PANEL

Sponsored by NISD

Session Organizer: Rizwan Uddin (*Univ of Illinois*)

Cyber security of sensitive installations in general is of heightened concern. These include NPPs and other installations related to the nuclear enterprise such as enrichment and storage facilities. For nuclear power plants, the concern is made further complicated by the fact that there is a simultaneous effort underway to at least partially switch from analog to digital I&C units. Digital assets at NPPs are being catalogued, regulatory bodies are developing guidelines for reviews, and new designs—such as SMRs—are taking advantage of similar transformations in other industries. A symposium was held at the University of Illinois in spring of 2013 to identify the challenges and to chart future directions for research. This panel will be aimed at furthering the conversation with the broader stakeholders in addressing the inter-related and evolving

issues of digital I&C and cyber security, and to identify approaches to manage associated risk in the nuclear arena. Panelists will include experts from the industry, regulatory bodies, vendors, academia, and national labs.

PANELISTS:

- Edward (Ted) Quinn (*Tech Resources*)
- Brian Arnholt (*B&W*)
- Barry Westreich (*NRC*)

Public Perception of Risk and Nuclear: Addressing the “Perception Gap”—Panel

See *Winter Meeting*, page 22

WEDNESDAY, NOVEMBER 13, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration

8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality

8:00 a.m. - 11:30 a.m. 2013 Risk Management: Technical Sessions

- Simulation Based PRA—I
- Simulation Based PRA—II
- Risk-Informed Resolution of Generic Safety Issue 191—I
- Risk-Informed Resolution of Generic Safety Issue 191—II
- System Thinking Approaches to Safety and Security
- Rethinking Emergency Planning and Response

1:00 p.m. - 3:30 p.m. 2013 Risk Management: Technical Sessions

- Aviation Safety Risk Analysis
- Risk-informed Decision Making & Regulation—I
- Risk Analysis in Healthcare—Papers/Panel
- Human Reliability and Performance in Nuclear Plant Operation
- Physics-of-Failure Models
- External Event Modeling for Risk Analysis

4:00 p.m. - 7:00 p.m. 2013 Risk Management: Technical Sessions

- Risk-Informed Decision Making & Regulation—II
- Human Performance Modeling and Analysis

WEDNESDAY, NOVEMBER 13, 2013, 8:00 A.M.

SIMULATION BASED PRA—I

Sponsored by NISD

Session Organizer: Gregory B. Baecher (*Univ of Maryland*)

Simulating Hydropower Dam System Risks, Gregory B. Baecher (*Univ of Maryland*)

Applying Monte Carlo Simulation to Propagate Uncertainty in Event Trees—An Application to Dam and Levee Risk Analysis, Robert C. Patev (*US Army Corps of Engineers*), Javier Ordonez (*Palisade Corporation, Ithaca, NY*)

Simulation Approaches in Seismic Risk Analysis, Martin W. McCann (*Jack R. Benjamin & Associates, Inc.*)

Simulation-Based Analysis for Nuclear Power Plant Risk Assessment: Opportunities and Challenges, Kevin Coyne, Nathan Siu (*US NRC*)

SIMULATION BASED PRA—II

Sponsored by NISD

Session Organizer: Gregory B. Baecher (*Univ of Maryland*)

Risk-Informed Severe Accident Management Guidelines, Matthew R. Denman (*SNL*), Katrina Groth, Timothy Wheeler (*SNL*)

Efficient Rare-Event Simulation and Decision Making, Chun-Hung Chen, John Shortle (*George Mason Univ*)

Impact of Team Characteristics on the Operating Crew Response in Complex Systems: A Modeling and Simulation Approach, Mandana Azarkhil, Ali Mosleh (*Univ of Maryland at College Park*)

RISK-INFORMED RESOLUTION OF GENERIC SAFETY ISSUE 191—I

Sponsored by NISD

Session Organizer: Ernest John Lowry Kee (*South Texas Project Nuclear Power Plant*)

Decision Process for GSI-191 Risk Informed Closure Path, Phillip D. Grissom (*Southern Nuclear*)

Risk-Informed Decision Making: Application in Nuclear Power Plant Design & Operation, Ernest John Lowry Kee (*South Texas Project Nuclear Operating Company*), Zahra Mohaghegh (*Univ of Illinois*), Reza Kazemi (*Soteria Consultants, LLC*), Seyed A. Reihani (*Univ of Illinois*), Bruce Letellier (*Alion Sci Technol*), Rick Grantom (*South Texas Project Nuclear Operating Company*)

EMBEDDED TOPICAL MEETING: RISK MANAGEMENT: WEDNESDAY

Adapting a PRA Model of Record to Support Risk-Informed Investigation of GSI-191, David H. Johnson, Donald J. Wakefield (*ABS Consulting*)

CASA Grande Uncertainty Propagation Framework for Risk-Informed Closure of GSI-191, Bruce C. Letellier (*Alion Sci Technol*), Ernest Kee (*South Texas Nuclear Operating Company*), David Morton (*Univ of Texas, Austin*)

RELAP5-3D Simulation of Core Flow Paths During a Hypothetical Debris-Generated Core Blockage Scenario, Rodolfo Vaghetto (*Texas A&M*), Ernie Kee (*South Texas Project Nuclear Power Plant*), Yassin A. Hassan (*Texas A&M*)

RISK-INFORMED RESOLUTION OF GENERIC SAFETY ISSUE 191—II

Sponsored by NISD

Session Organizer: David H. Johnson (*ABS Consulting, Inc.*)

Modeling Loss of Coolant Accident Frequencies and Break Sizes, Jeremy J. Tejada, David P. Morton, Ying-An Pan (*Univ of Texas, Austin*)

Location Specific LOCA Frequencies for GSI-191 Applications, Karl N. Fleming (*KNF Consulting Services LLC*), Bengt Lydell (*Scandpower Risk Management Inc.*)

Experimental Study of Chemical Effects on ECCS Strainer Head Loss and Flow Sweep Test with Two Debris Beds (Blender-Processed Debris Bed vs. NEI-Processed Debris Bed), Seung-Jun Kim (*Univ of New Mexico*), Janet Leavitt (*Alion Sci Technol*), Edward D. Blandford (*Univ of New Mexico*), Ernie Kee (*South Texas Project Nuclear Operating Company*), Kerry J. Howe (*Univ of New Mexico*)

Risk-Informed Resolution of Chemical Effects for Generic Safety Issue 191, Tim Sande, Austin Michael Glover (*Enercon Services, Inc.*)

Measurement of Water Chemistry Sensitivity on NUKON Fibrous Debris Penetration Through a Sump Strainer, Saya Lee, Rodolfo Vaghetto, Yassin A. Hassan (*Texas A&M*)

SYSTEM THINKING APPROACHES TO SAFETY AND SECURITY

Sponsored by NISD

Session Organizer: Lawrence Hettinger (*Liberty Mutual Research Institute for Safety*)

Managing for the Unexpected: A Cultural Perspective, Luigi Macchi, Pia Oedewald, Teemu Reiman, Elina Pietikäinen, Nadezhda Gotcheva, Maria Ruuskanen, Kuapo Viitanen (*VTT - Technical Research Centre of Finland*)

Hazard Analysis for Managing Risk in Nuclear Plant Digital Instrumentation and Control Systems, Raymond C. Torok (*EPRI*), Bruce Geddes (*Southern Engineering Services*)

System Security: Rethinking Security for Facilities with Nuclear Materials, Adam D. Williams (*MIT/SNL*)

A New Approach to Risk Management and Safety Assurance of Digital Instrumentation and Control Systems, John Thomas, Nancy Leveson (*MIT*)

Building Organizational Culture through Resilience, Jurate Liutvinskaite, Tom McDaniel (*Siemens Energy Inc*)

RETHINKING EMERGENCY PLANNING AND RESPONSE

Sponsored by NISD

Session Organizer: Vicki Marion Bier (*Univ of Wisconsin, Madison*)

Alternative Evacuation Strategies for Nuclear Power Accidents, Gregory D. Hammond, Vicki M. Bier (*Univ of Wisconsin, Madison*)

Rethinking Nuclear Emergency Planning, Preparations, and Response, Robert L. Goble (*Clark Univ*), Vicki Bier (*Univ of Wisconsin, Madison*)

The Relative Importance of Mitigation, Early Phase, Intermediate Phase, and Late Phase Response, Richard S. Denning (*Ohio State*), Douglas Osborn (*SNL*), Acacia Brunett, Tunc Aldemir (*Ohio State*)

A Quantitative Significance Determination Process for Nuclear Plant EP, Randolph L. Sullivan (*NRC*)

Risk-Based Nuclear Accident Evacuation and Remediation Management, Zdenko Simic (*European Commission Joint Research Center - Institute for Energy and Transport*), Davor Grgic (*Univ of Zagreb*)

WEDNESDAY, NOVEMBER 13, 2013, 1:00 P.M.

AVIATION SAFETY RISK ANALYSIS

Sponsored by NISD

Session Organizer: Sherry Borener (*FAA*)

The Economics of Aviation Risk Management: A Preliminary Investigation, Ashley Nunes (*ISA Software*), Sherry Borener (*Federal Aviation Administration*), Ian Crook (*ISA Software*)

Analysis of the Effects of Communication and Surveillance Facility Service Outages on Traffic Separations, Sherry Borener (*Federal Aviation Administration*), Vitaly S. Guzhva (*MCR LLC*)

Quantifying Risk in Commercial Aviation with Event Sequence Diagrams and Fault Trees, Robin L. Dillon-Merrill (*Georgetown Univ*), Vicki M. Bier (*Univ of Wisconsin, Madison*), Sherry S. Borener, Mindy J. Robinson (*Federal Aviation Administration*), Kandi K. Mitchell (*Crown Consulting, Inc.*), Poornima Balakrishna (*Saab Sensis Corporation*), Amanda Hepler (*Innovative Decisions, Inc.*), Aleta Best (*Federal Aviation Administration*)

Airport Collision Risk Assessment Using Operational Surveillance, Timothy P. Waldron, Andrew T. Ford (*Saab Sensis Corporation*)

RISK-INFORMED DECISION MAKING & REGULATION—I

Sponsored by NISD

Session Organizer: Kevin A. Coyne (U. S. NRC)

Risk-Informed Significance Determination Process for New Reactors, Christopher Joseph Fong (NRC), Donald A. Dube (NRC (retired)), Thomas J. Kozak (NRC)

Use of Risk Information for Prioritizing Inspections, Tests, Analyses and Acceptance Criteria for Nuclear Power Plants Licensed Under 10 CFR Part 52, Tony Nakanishi, Mark A. Caruso, Christopher R. Welch (NRC)

Normalized Core Damage Frequency as a Risk Metric, William J. Galyean (NuScale Power)

Challenges for New and Advanced Reactor Risk-Informed Applications: A Regulatory Perspective, Donnie Harrison (NRC)

RISK ANALYSIS IN HEALTHCARE—PAPERS/PANEL

Sponsored by NISD

Session Organizer: Reza Kazemi (FDA)

PAPERS

A Bayesian Belief Network for Risk of Line Infection, Reza Kazemi (FDA), Ali Mosleh (Univ of Maryland), Meghan Dierks (Harvard Medical School)

Quality Risk Management of Pharmaceuticals, H. Gregg Claycamp (US Food and Drug Administration)

PANEL DISCUSSION

Despite efforts to provide safe, effective medical care, adverse events still occur with some regularity. Although risk cannot be entirely eliminated from healthcare activities, an important goal is to develop effective and durable mitigation strategies to render the system “safer.” In order to do this, though, we must develop models that comprehensively and realistically characterize the risk. In the healthcare domain, this can be extremely challenging due to the wide variability in the way that healthcare processes and interventions are executed and also due to the dynamic nature of risk in this particular domain. This panel discusses the applicability of engineering systems’ risk analysis methods in this healthcare domain and trends in risk analysis in this field.

PANELISTS:

- Reza Kazemi (USFDA)
- Gregg Claycamp (USFDA)

- Meghan Dierks (Harvard Medical School)
- Bradford Winters (Johns Hopkins University)
- Monifa Vaughn-Cooke (UMD)
- Yashika Rahaman (USFDA)

HUMAN RELIABILITY AND PERFORMANCE IN NUCLEAR PLANT OPERATION

Sponsored by NISD

Session Organizer: Luca Podofillini (Scherrer Inst)

SACADA Database for Human Reliability and Human Performance, Yung Hsien James Chang (NRC)

Results and Insights from the US HRA Empirical Study, Huafei Liao (SNL), John Forester (INL), Vinh Dang (Scherrer Inst), Andreas Bye (OECD Halden Reactor Project, Institute for Energy Technology), Erasmia Lois, Y. James Chang (NRC)

An Empirical Investigation of Team Decision-Making with Emergency Procedures, Salvatore Massaiu, Lars Holmgren (OECD Halden Reactor Project)

Modeling and Simulation of Operator Problem-Solving Styles, Yuandan Li, Ali Mosleh (Univ of Maryland)

Cyber Security and Risk Assessment: HRA Where Art Thou?, David I. Gertman (INL)

PHYSICS-OF-FAILURE MODELS

Sponsored by NISD

Session Organizer: Stephen Dale Unwin (PNNL)

An Agent Autonomy Approach to Probabilistic Physics-of-Failure Modeling of Dynamic Systems with Interacting Failure Mechanisms, Katherine Emily Gromek, Mohammad Modarres (Univ of Maryland)

Probabilistic Risk Assessment for Anti Surge System API 672 Air Compressors During Operational Phase, Subhadip Sengupta (Det Norske Veritas)

The Reliability Effects of Transient-Induced Degradation, Brittany L. Guyer, Michael W. Golay (MIT)

A Proposed Method for Estimating Failure Rates of Degraded Passive Components in the NRC Significance Determination Process, Kenneth Ian Johnson, Stephen D. Unwin, William J. Ivans, Peter P. Lowry (PNNL)

EXTERNAL EVENT MODELING FOR RISK ANALYSIS

Sponsored by NISD

Session Organizer: Ahmed E. Elbanna (*Univ of Illinois*)

SCEC/USGS Dynamic Earthquake Rupture Code, Ruth Harris (*USGS*)

Tsunami Probabilistic Risk Assessment (PRA) for Kashiwazaki-Kariwa Nuclear Power Station Unit 7, Yasunori Yamanaka, Shinichi Sugimoto (*Tokyo Electric Power Company*)

An Integrated Framework to Advance Fire PRA for Nuclear Power Plants, Tatsuya Sakurahara, Zahra Mohaghegh (*Univ of Illinois*), Ernie Kee, Shawn Rodgers (*South Texas Project Nuclear Operating Company*), Mark Brandyberry (*Univ of Illinois*), Reza Kazemi (*Soteria Consultants, LLC*), Seyed A. Reihani (*Univ of Illinois*)

Towards Physics-Based Seismic PRA, Ahmed E. Elbanna (*Univ of Illinois*), Zahra Mohaghegh (*Soteria Consultants, LLC*), Ernie Kee (*South Texas Project Nuclear Operating Company*), Seyed-A. Reihani (*Univ of Illinois*), Reza Kazemi (*Soteria Consultants*), Shawn Rodgers (*South Texas Project Nuclear Operating Company*)

WEDNESDAY, NOVEMBER 13, 2013, 4:00 P.M.

RISK-INFORMED DECISION MAKING & REGULATION—II

Sponsored by NISD

Session Organizer: Kevin Coyne (*NRC*)

The Impact of Space Weather on NRC Licensed Facilities, Leroy A. Hardin (*NRC*)

Development of a DOE Standard for Probabilistic Risk Assessment at Nuclear Facilities, Steven L. Krahm (*Vanderbilt Univ*), James B. O'Brien (*DOE*), Karl N. Fleming (*KNF Consulting Services LLC*)

Probabilistic Risk Management in Public Sector Construction Projects, Arthur G. Haugh (*Longenecker and Associates*), Laurie Folden, John Eschenberg (*DOE*)

Risks from Emerging Technologies: Towards an Effective Public Management Response, Teri N. Leffer (*US Dept of Energy/NNSA*)

You Don't Plan to Have an Accident, Richard E. Malenfant (*LANL, retired*)

Risk Management Study of Aqueous Actinide Recovery and Recycle Capability Reconfiguration at the Los Alamos National Laboratory, Loren Dale Sivils, Louis D. Schulte, J. Matthew Jackson, Robert Y. Parker, Jim Rubin, Keith W. Fife, Stephen L. Yarbrow (*LANL*)

HUMAN PERFORMANCE MODELING AND ANALYSIS

Sponsored by NISD

Session Organizer: Yung Hsien James Chang (*NRC*)

PSA-Informed Review of Emergency Procedural Guidance, Luca Podofillini, Vinh N. Dang, Bernhard Reer (*Scherrer Inst*)

IDHEAS---An Integrated Decision-Tree Human Event Analysis System for Human Reliability Analysis, Gareth W. Parry (*ERIN Engineering & Research*), J. A. Forester (*INL*), V. N. Dang (*Paul Scherrer Inst*), S. M. L. Hendrickson (*SNL*), M. Presley (*EPRI*), E. Lois, Jing Xing (*NRC*)

Overview of a Model-Based HRA Methodology, Nsimah J. Ekanem, Ali Mosleh (*Univ of Maryland*)

Human Reliability Analysis for Digital Human-Machine Interfaces, Ronald Laurids Boring (*INL*)

Defining Human Failure Events for Petroleum Risk Analysis, Ronald Laurids Boring (*INL*)

THURSDAY, NOVEMBER 14, 2013

7:30 a.m. - 2:00 p.m. Meeting Registration

8:00 a.m. - 11:30 a.m. 2013 Risk Management: Technical Sessions

- Risk Management for Long Term NPP Operation
- Perception of Risk-Informed Programs
- Socio-technical Systems Risk Modeling
- Fire PRA Lesson Learned
- Complexity Sciences and Risk Management
- Safety Culture

1:00 p.m. - 4:30 p.m. 2013 Risk Management: Technical Sessions

- Uncertainty Modeling and Analysis

2013 Risk Management: Closing Plenary
"Risk Management: History & Perspectives"

- Radiation, Nanotechnology, and Risk: Building Understanding and Informatics Opportunities
- Expert Elicitation
- Risk-Informed Resolution of Generic Safety Issue 19I—III

THURSDAY, NOVEMBER 14, 2013, 8:00 A.M.

RISK MANAGEMENT FOR LONG TERM NPP

OPERATION

Sponsored by NISD

Session Organizer: Stephen M. Hess (EPRI)

Investments Portfolio Optimal Planning, a Tool for an Integrated Life Cycle Management, Jerome Lonchamp, Karine Fessart (EdF)

MELCOR/MACCS2 Analysis for BWR Mark I Filtered Containment Venting, Douglas M. Osborn, Kyle W. Ross, Nathan E. Bixler, Jeffrey N. Cardoni, Matthew R. Denman (SNL)

A Bayesian Methodology for Power Plant Online System Health Monitoring, Masoud Pourali (KimiaPower PLLC), Ali Mosleh (Univ of Maryland)

Asset Risk Management for Long Term Operation Using Principles of Complex Adaptive Systems, John P. Gaertner (EPRI)

Integrated Life Cycle Management: A Degradation-Based Approach to Calculate the Likelihood of Failure of a Component or a Structure, Thomas C. Esselman (Lucius Pitkin Inc), Paul Bruck, Srikanth Cherukuri (Lucius Pitkin, Inc.), Charles Mengers (EPRI)

PERCEPTION OF RISK-INFORMED PROGRAMS—PANEL

Sponsored by NISD

Session Organizer: Amir Afzali (SNC)

Risk-informed programs are increasingly being used to improve plant safety, create flexibility, and reduce unnecessary burden. The available evidence from the operational experience indicates that the implementation of risk-informed programs, whether regulatory-driven or voluntary adopted, have resulted in improvement in plant safety, increased effectiveness of regulatory oversight, and enhanced operational flexibility. Examples of such successful risk-informed programs include Maintenance Rule, the Significance Determination Process of the Reactor Oversight Program, and Risk-Informed Inservice Inspections. Yet, there is a predominant perception in some sectors of the regulatory body and organizations representing nuclear industry as well as nuclear facilities that implementation of risk-informed programs is likely to result in the loss of safety margins. It is understood that how people and organizations react to programs impacting risk is affected by many factors including how risk information is perceived and communicated and how alternatives are structured. Therefore, for ensuring effective and timely transition to risk-informed programs, allowing for early realization of benefits of the transition, it is critical to address this erroneous perception of risk-informed programs. A couple of the first steps in this process are to develop an understanding of the factors that contribute to formation of this negative perception of risk-informed programs and to develop options for fostering sound consideration of these programs. The panelists in this session

provide their opinion on how this perception is created and how it can be corrected through answering questions such as the following:

1. What factors have resulted in this negative perception being created?
2. To what extent are utilities and regulator contributing to these factors?
3. What are the implications of the way risk implications are communicated?
4. How can we intervene to prevent such adverse perceptions?

PANELISTS:

Stuart Lewis (EPRI)

Jim Chapman (Scientech Curtiss Wright Flow Control)

Donnie Harrison (NRC)

Victoria Anderson (NEI)

SOCIO-TECHNICAL SYSTEMS RISK MODELING

Sponsored by NISD

Session Organizer: Justin T. Pence (ANL)

A Methodology to Identify Organizational Interface Failures for Use in Risk and Reliability Assessments, Ali Mosleh (Univ of Maryland), Thiago Pires (Univ of Maryland, College Park)

Considering Organizational Dependencies in a Multi-Unit PRA, Suzanne Schroer (NRC), Mohammad Modarres (Univ of Maryland)

Understanding and Modelling Organizational Factors Within Probabilistic Risk Analyses, Tim Bedford, Magda Gajdosz, Susan Howick (Univ of Strathclyde)

Learning from Failures Using Decision Making Techniques, Ashraf W. Labib (Univ of Portsmouth), invited

A Sociotechnical Systems Design for High Reliability Multidisciplinary Teams, Eli Berniker (Pacific Lutheran University - Emeritus)

FIRE PRA LESSON LEARNED—PANEL

Sponsored by NISD

Session Organizer: Amir Afzali (SNC)

Fire risk assessments have shown that fire is one of the most important risk contributors for Nuclear Power Plants (NPPs). Moreover, operational experience has confirmed that fires are one of the most frequent hazards experienced by NPPs. On the other hand, it has been challenging to develop models and programs that can effectively predict and manage this significant hazard. As a result, there has been intense discussion around the tools, methods, and programs available to ensure adequate protection against the

hazard. One of the tools/methods that is being extensively used to effectively and efficiently address the fire hazard is Fire Probabilistic Risk Assessment (FPRAs). However, the effectiveness of FPRAs to provide adequate realistic insights for conservative decision-making is being questioned. The purpose of this panel session is to discuss the value of FPRAs by sharing the insights that have been gained from developing FPRAs. For example, the panelist will discuss the following questions: Do FPRAs provide unique safety improving insights? If yes, what are they? Does the state-of-the-practice create siloed conservatisms that would result in non-conservative decision making? If yes, what are they and how could they lead to non-conservative decision making?

PANELISTS:

- Kiang Zee (*Erin Engineering*)
- Jim Chapman (*Sciencetech Curtiss Wright Flow Control*)
- Young Jo (*Southern Nuclear Company*)
- Matt Landry (*Southern Nuclear Company*)
- Anil Julka (*Nextera Energy*)

COMPLEXITY SCIENCES AND RISK MANAGEMENT

Sponsored by NISD

Session Organizer: Mohamed Hibti [*Électricité de France (EDF)*]

Is the Complexity of Hazardous Socio-technical Systems “Directly” Connected to Major Event Occurrence?, Yves Andre Dien (*EDF - R&D*), Dechy Nicolas (*IRSN*), Llory Michel (*IAO*)

Dynamic Learning of Latent Residuals for Diagnosing New Class Drifts in Wind Turbines, Roozbeh Razavi-Far, Enrico Zio (*Department of Energy, Politecnico di Milano*)

Resilience Metrics of Coupled Coastal-Energy Systems, Daniel Alexander Eisenberg (*Contractor to the US Army Engineer Research and Development Center*), Matthew E. Bates (*US Army Engineer Research and Development Center*), Thomas P. Seager (*Arizona State Univ*), Igor Linkov (*US Army Engineer Research and Development Center*)

An Andromeda Extension for Network Based Safety Assessment, Ait-Ferhat Dehia (*Université de Bordeaux*), Friedlhuber Thomas (*EDF R&D and Ecole polytechnique*), Mohamed Hibti (*EDF R&D*)

SAFETY CULTURE

Sponsored by NISD

Session Organizer: Justin T. Pence (*ANL*)

Training Labs: A Way for Improving Safety Culture, Carlo Rusconi (*Sogin*)

How to Elucidate and Judge Unknown Shadow of Nuclear Safety Culture, Gueorgui Ivanov Petkov, Emil Kostov (*Tech Univ of Sofia*)

An Exploration of the Correlations Between Fatal Accident Rates and the Cultural Dimensions of Power Distance, and Individuality, Fred A. Infortunio (*Atkins Global*)

SMR PRA Advances and Challenges–Panel

See *SMR 2013*, page 55

THURSDAY, NOVEMBER 14, 2013, 1:00 P.M.

UNCERTAINTY MODELING AND ANALYSIS

Sponsored by NISD

Session Organizer: Mohammad Modarres (*Univ of Maryland*)

A RISMC-Informed Metatheory of Theories of Nuclear Safety, Paul Nelson (*Texas A&M*), Gangyang Zheng (*Harbin Engineering University/Texas A&M University*), Fatma Yilmaz (*South Texas Plant Nuclear Operating Co.*), Zhijian Zhang (*Harbin Engineering Univ*)

Non-Standard Methods for Extremely Low Probability Assessments, Robert E. Kurth (*Engineering Mechanics Corp of Columbus*), Cedric Sallaberry (*SNL*), David Rudland (*NRC*)

Uncertainty Characterization Techniques for the xLPR Project, Mark T. Kirk (*NRC*), Marjorie Erickson (*Phoenix Engineering Associates Inc.*), Bob Kurth (*Engineering Mechanics Corp of Columbus*), Cedric Sallaberry (*SNL*)

A Probabilistic Characterization of Simulation Model Uncertainties, Mohammad Modarres, Victor Ontiveros (*Univ of Maryland*)

Unscented Transform for Approximating Mean and Covariance of Distributions in BEPU Methodologies, Douglas A. Fynan (*Univ of Michigan*)

CLOSING PLENARY SESSION—RISK MANAGEMENT: HISTORY & PERSPECTIVES

Sponsored by NISD

Session Organizer: Ronald A. Knief (*SNL*)

Nuclear industry interests with respect to “risk” have included defining, assessing, communicating, informing, and managing it. Dr. B. John Garrick has been a key player every step of the way. Now Dr. Garrick would like to share with us his unique perspective on the history and evolution of nuclear risk management. This mini-plenary session will also include a pair of vignettes on risk management where the consequences, respectively, were (1) the individual’s own life and (2) the need to fundamentally re-shaping an entire nuclear enterprise.

SPEAKERS:

- B. J. Garrick (*Pickard, Lowe & Garrick, ret.*)
“PRA-Based Risk Management: History & Perspectives”
- S. M. Gutierrez (*Sandia National Laboratories*)
“Risk Management from the Perspective of a Fighter Pilot, Test Pilot and Astronaut”
- B. W. Mullins (*HQ USAF*)
“Leadership and Risk Management”

RADIATION, NANOTECHNOLOGY, AND RISK: BUILDING UNDERSTANDING AND INFORMATICS OPPORTUNITIES—PANEL

Sponsored by NISD

Session Organizer: Mark D. Hoover (*Natl Inst Occupational Safety & Health*)

Nanotechnology is the understanding and control of matter at the nanoscale, at dimensions between approximately 1 and 100 nanometers, where unique phenomena enable novel applications.

Nano-engineered structural materials, metals, coatings, coolants, ceramics, sorbents, and sensors may be particularly enabling in radiation-related applications. This panel will consider issues for assessing and managing radiation and nano-associated risks including: (1) How emerging applications of nanotechnology may affect radiation-related activities, and (2) How established resources may provide a workable framework and process to anticipate, recognize, evaluate, control, and confirm mission success for such activities. The radiation protection community is fortunate that a significant body of information has been derived from studying radon decay products and other naturally occurring nanoparticles, ultrafine aerosols of actinides, and aerosols from atmospheric testing. For example, we understand that filtration of airborne nanoparticles is highly efficient, due to the effective collection of small airborne particles by diffusion. Collectively, we can advance a visionary “radnanoinformatics” approach in which we determine what information is relevant to the application and radiation safety aspects of nanotechnology and then collect, validate, store, share, mine, analyze, model, and apply that information.

PANELISTS:

- Mark D. Hoover (*NIOSH*)
- Ronald A. Knief (*SNL*)
- Terry Brock (*NRC*)
- John Boice (*NCRP*)
- Lisa Friedersdorf (*OSTP-NNCO*)
- Robert Pohanka (*OSTP-NNCO*)
- Tarek Fadel (*OSTP-NNCO*)
- Janet Carter (*OSHA*)
- Donald Cool (*ISCORS*)

EXPERT ELICITATION

Sponsored by NISD

Session Organizer: Tim Bedford (*Univ of Strathclyde*)

A Meta-Data Informed Comparison of Expert Judgment Estimates for Probabilistic and Physical Quantities, Ellis Steven Feldman, Ali Mosleh (*Univ of Maryland*)

Dynamic Uncertainty Handling for Coherent Decision Making in Nuclear Emergency Response, Manuele Leonelli, James Q. Smith (*The University of Warwick*)

Validating Expert Judgment, Roger M. Cooke (*Resources for the Future*)

Structured Expert Judgement for Evidence Based Decision Making, Tim Bedford (*Univ of Strathclyde*), Anca Hanea (*Delft University of Technology*)

RISK-INFORMED RESOLUTION OF GENERIC SAFETY ISSUE 19I—III

Sponsored by NSID

Session Organizer: Ernest John Lowry Kee (*STPNOC*)

Quantifying Chemical Effects using the Risk Informed Method, Janet J. Leavitt, Bruce Letellier (*Alion Sci Technol*), Kerry Howe, Seung-Jun Kim (*Univ of New Mexico*), Seyed-A. Reihani (*University of Illinois at Urbana-Champaign (UIUC)*), Ernie Kee (*South Texas Project Nuclear Operating Company*)

Temperature Effect on Small Size NUKON Fibrous Debris Settling Velocity, Saya Lee, Landon M. Brockmeyer, Shamsul A. B. Sulaiman, Yassin A. Hassan (*Texas A&M*)

Rheological Characterization of Buffered Boric Acid Aqueous Solutions, Serdar Ozturk (*Department of Nuclear Engineering, Texas A&M University*), Xinrui Ma, Yassin A. Hassan (*Nuclear Eng. Dept., Texas A&M University*)

Embedded Topical Meeting: 2nd ANS SMR 2013 Conference



GENERAL CHAIR:
Thomas L. Sanders
Savannah River National Laboratory



ASSISTANT GENERAL CHAIR:
Philip Moor
High Bridge Associates



TECHNICAL PROGRAM CHAIR:
Vince Gilbert
EXCEL SERVICES CORPORATION



ASSISTANT TECHNICAL PROGRAM CHAIR:
Mark Campagna
ABS Consulting

TUESDAY, NOVEMBER 12, 2013

| | |
|------------------------|---|
| 7:30 a.m. - 5:00 p.m. | Meeting Registration |
| 8:00 a.m. - 10:00 a.m. | Spouse/Guest Hospitality |
| 8:00 a.m. - 11:30 a.m. | 2013 SMR Meeting Plenary I <ul style="list-style-type: none">• Meeting Overview and General Topics |
| 1:00 p.m. - 6:05 p.m. | 2013 SMR Meeting: Technical Sessions <ul style="list-style-type: none">• SMR iPWR Refueling Designs and Operation• SMR Research and Development—I• SMR Nonproliferation and Security• SMR Emergency Planning and Execution |

TUESDAY, NOVEMBER 12, 2013, 8:00 A.M.

PLENARY I: MEETING OVERVIEW AND GENERAL TOPICS

Sponsored by OPD

Session Organizer: James (Vince) V. Gilbert (*EXCEL Services Corp*)

SPEAKERS:

Welcome and ANS President's Remarks

Donald R. Hoffman (*President and CEO, EXCEL Services Corporation*)

Chair Opening Remarks

Thomas Sanders (*SRS*)

Technical Program Overview

Philip Moor (*High Bridge*)

SMR Regulatory Perspectives

William D. Magwood, IV (*Commissioner U.S. NRC*)

DOE SMR Status and Direction

Dr. Peter B. Lyons (*Assistant Secretary for Nuclear Energy, US DOE*)

Honorable Joe Wilson, U.S. House Representatives (*Invited*)

US Member of Congress to be determined

SMR Financial Perspectives

Chris Gadomski (*Lead Analyst, Nuclear, Bloomberg New Energy Finance*)

TUESDAY, NOVEMBER 12, 2013, 1:00 P.M.

SMR IPWR REFUELING DESIGNS AND OPERATIONS

Sponsored by OPD

Session Organizer: James (Vince) V. Gilbert (*EXCEL Services Corp*)

A critical component to operating and maintenance of any nuclear power plant, including small modular reactors, is safe efficient refueling operations. This panel session will discuss the refueling designs and refueling operations associated with various SMR designs. Each panelist will present an overview of their respective companies' refueling and fuel handling design followed by a Q&A session with session attendees.

PANELISTS:

- Frank Helin (*Generation mPower*)
- Ross Snuggerud (*NuScale Power*)
- Alex Harkness (*Westinghouse*)
- Representative from Holtec to be determined

SMR RESEARCH AND DEVELOPMENT—I

Sponsored by OPD

Session Organizer: Robert G. Hill (*Progress Energy Co.*)

Nuclear Oil Shale—Partnership Opportunity for an Expanded Domestic SMR Market, Daniel Joseph Curtis, Charles W. Forsberg (*MIT*)

Cogeneration of Liquid Fuels and Electricity on Oahu, Michael W. Patterson (*INL*)

Comparison of Heat Exchanger Designs for Use with the Modular High Temperature Gas Cooled Reactor (MHTGR), Caleb Robison, Fatih Aydogan (*Univ of Idaho*)

Is a PWR SMR or a BWR SMR the Better Choice for the Future?, Koroush Shirvan, Mujid Kazimi (*MIT*)

SMR NONPROLIFERATION AND SECURITY

Sponsored by OPD; cosponsored by the NNTG

Session Organizer: Robert A. Bari (*BNL*)

There is interest worldwide in the development and use of small modular reactors. Invited panelists will discuss issues for technology and policy related to nonproliferation and security of SMRs. A broad range of representative views will be given, including

national and international perspectives. Each panelist will present a short overview, and this will be followed by discussions with the conference attendees.

PANELISTS:

- Jeremy Whitlock (*AECL*)
- Matthew Bowen (*NNSA*)
- Jon Phillips (*IAEA*)
- Alex Burkart (*Department of State*)
- Paul Genoa (*NEI*)

SMR EMERGENCY PLANNING AND EXECUTION

Sponsored by OPD

Session Organizer: Daniel P. Stout (*TVA*)

Licensees must provide reasonable assurance that adequate Emergency Planning (EP) measures to protect public health and safety can be implemented in the event of a radiological emergency. Small Modular Reactors (SMRs) contain features that result in substantially reduced source terms and less off-site release during severe accidents. How will SMR designers demonstrate significantly reduced dose at the site boundary from postulated accidents? If the population at the site boundary is protected as well or better than the population 10 miles from a large reactor, what type of EP is appropriate? What regulatory policy shifts are necessary to adapt EP expectations to account for SMR safety improvements, and what are the implications for future site selection opportunities?

PANELISTS:

- Paul Genoa (*NEI*)
- Steve Mirsky (*NuScale*)
- Sandra Sloan (*Generation mPower*)
- Trish Milligan (*NRC*)

WEDNESDAY, NOVEMBER 13, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration

8:00 a.m. - 10:00 a.m. Spouse/Guest Hospitality

8:00 a.m. - 11:30 a.m. 2013 SMR Meeting Plenary II:

- “SMR iPWR Owner-Operator Nth of a Kind Vision”
- “SMR iPWR Licensing-Generic Issues-Siting-Construction”

1:00 p.m. - 3:30 p.m. 2013 SMR Meeting: Technical Sessions

- SMR Site Suitability–Papers/Panel
- SMR Research and Development—II

4:00 p.m. - 7:30 p.m. 2013 SMR Meeting: Technical Sessions

- SMR Codes and Standards
- Department of Energy Investments in Advanced Nuclear Power

PLENARY II: SMR iPWR OWNER-OPERATOR NTH OF A KIND VISION

Sponsored by OPD

Session Organizer: Sandra M. Sloan (*B&W mPower, Inc.*)

Unique SMR design features, increased levels of standardization, and extensive multi-unit configurations necessitate a paradigm shift in the approach to operations as compared to one- or two-unit, large base-load plants. This panel will explore the vision for operations and maintenance associated with ownership of a set, or even fleet, of small modular reactors. Specific topics may include unique SMR staffing concepts, unique operational configurations such as load following and extended reduced power operations, adaptations to traditional operational programs and training programs, fleet-wide monitoring and data collection for performance improvement, and centralized maintenance and inventory control.

PANELISTS:

Opening Remarks
Vince Gilbert (*EXCEL*)

Speaker Introductions
Sandra Sloan (*Generation mPower*)

- Dan Stout (*TVA*)
- Mike McGough (*NuScale*)
- Scott Bond (*Missouri Charge*)
- Representative from Holtec to be determined

PLENARY II: SMR iPWR LICENSING-GENERIC ISSUES-SITING-CONSTRUCTION

Sponsored by OPD

Session Organizer: Stewart L. Magruder (*NRC*)

This session will focus on the status and plans for designing and licensing small modular light water reactors (SMRs). The session will present the current status of NRC licensing activities related to SMRs including Commission papers, SMR design-specific guidance, etc. In addition, the presentations will summarize the licensing activities of several vendors, with particular attention to the ways in which SMR licensing, siting, and construction issues differ from traditional, larger reactors. The panel will discuss some of the potential issues related to how US NRC design certification integrates with the regulatory processes in international markets.

PANELISTS:

Opening Remarks and speaker introductions
Stewart Magruder (*NRC*)

- Joelle Starefos (*NRC*)
- Peter Hastings (*Generation mPower*)
- Ed Wallace (*NuScale*)
- Rob Sisk (*Westinghouse*)
- Representative from Holtec to be determined

WEDNESDAY, NOVEMBER 13, 2013, 1:00 P.M.

SMR SITE SUITABILITY–PAPERS/PANEL

Sponsored by OPD

Session Organizer: Kenneth L. Ferguson (*KL Ferguson, LLC*)

PAPERS

Factors to Consider for Repowering Existing Fossil Fuel Facilities with Small Modular Reactors, Dan M. Ervin (*Salisbury Univ*)

Application of Spatial Data Modeling and Geographical Information Systems (GIS) for Identification of Potential Siting Options for Small Modular Reactors, Gary T. Mays (*ORNL*)

PANEL DISCUSSION

The concept of small modular reactors (SMRs) has captured the imagination of vendors and the interest of potential users. Successful SMR projects will involve safe reliable designs and suitable and available locations. This panel session will address types and examples of sites that can be considered, siting considerations included in designs, as well as regulatory factors and considerations. In addition, the panel will address siting considerations in which the SMR concept involves unique considerations, greater or less attention or similar attention compared to larger sized nuclear power

plants. Site sizes, repowering, public acceptance, underground siting, low population zone consideration, and details of site environmental analysis scopes are examples of content. Related status, recent progress, remaining issues, and related planning will be identified.

PANELISTS:

Opening Remarks by Cochairs and speaker introductions
Kenneth Ferguson (*Hukari-Ascendent*)

- Dan Stout (*TVA*)
- Steve Routh (*Bechtel*)
- Scott Bond (*Ameren*)
- Mark Notich (*NRC*)
- Robett Lambe (*GEI Consultants*)

SMR RESEARCH AND DEVELOPMENT—II

Sponsored by OPD

Session Organizer: Keith S. Bradley (*ANL*)

Security Analysis and Response Force Modeling for iPWR SMRs, Benjamin B. Cipiti, Felicia A. Duran, Gregory D. Wyss, Tom G. Lewis (*SNL*)

Advanced Reactor Licensing Strategy—A Perspective on Principal Design Criteria, Thomas A. Kevern (*NRC*)

Buoyant Systems for Refueling (BSR), David C. Vickerman (*E.K. Fox & Associates, Ltd*)

Performance Evaluation of SMART Core Protection and Monitoring System for Simulator Coupling, BonSeung Koo, DaeHyun Hwang (*KAERI-Korea*)

SLIMM-Scalable Liquid Metal Small Modular Reactor, Mohamed S. El-Genk (*Univ of New Mexico*)

SMR Manufacturing: Monte Carlo Modeling of Integrated Reactor Vessel Fabrication, Jeff H. Terry (*Illinois Inst of Technology*), Arnold Kotlyarevsky, Xuan Chen, Andrew Kumiega, Benxin Wu (*IIT*)

Evaluation of the Robustness of a Generic Small Modular Reactor Against Seismic Events, Nicholas DeVone Catella, Daniel Eggers (*Simpson Gumpertz & Heger*)

Thermal-Hydraulic Design for the B&W mPower SMR, Robert P. Martin, E. S. Williams, J. G. Williams (*Babcock & Wilcox mPower*)

Simulation of a Syngas from Coal Production Plant Coupled to a High Temperature Reactor, Frederick Johannes Botha, Robert Dobson, Thomas Harms (*Stellenbosch Univ*)

WEDNESDAY, NOVEMBER 13, 2013, 4:00 P.M.

SMR CODES AND STANDARDS

Sponsored by OPD

Session Organizer: Don Spellman (*ORNL*)

As the nuclear industry moves forward into new territory, the United States Voluntary Consensus Standards organizations must move with it. Many new designs are on the drawing boards including Small Modular Reactors. Regulators, Architect Engineers, Utilities, and ANSI are primary players in this anticipated need. Are available NCS adequate and appropriate for the many new design and operational challenges that will be presented by these new technologies? Today's panel will attempt to address the variety of issues that have come to light so far.

PANELISTS:

- Tom Boyce (*NRC*)
- Prasad Kadambi (*ANSI*)
- Ed Wallace (*NuScale*)
- William Bell (*SCANA*)
- Steve Stamm (*Shaw*)
- Don Spellman (*ORNL*)

DEPARTMENT OF ENERGY INVESTMENTS IN ADVANCED NUCLEAR POWER

Sponsored by OPD

Session Organizer: Craig D. Welling (*Department of Energy*)

U.S. Department of Energy (DOE), Office of Nuclear Energy (NE) has engaged in an initiative to fund industry-led research on advanced reactor technologies. This effort could support longer-term deployment of designs with improved safety, security, and economic benefits. NE has selected four firms to receive grants under the Advanced Reactor Research and Development (R&D) Funding Opportunity Announcement issued in February 2013. The recipients will conduct cost-shared R&D on selected technology needs that were identified by the Advanced Reactor Concepts Technical Review Panel process. The panelists will speak on R&D that they will pursue.

PANELISTS

Opening Remarks and Speaker Introductions
Craig Welling (*DOE*)

Silicon Carbide Composite Material, Representative from General Atomics to be determined

High Temperature Insulation Materials and Robust Analysis Tools, Representative from GE Hitachi Nuclear Energy to be determined

Natural Circulation Designs for Advanced Nuclear Reactors that Utilize a Lead Bismuth Coolant, Representative from Gen4 Energy to be determined

Analysis on Sodium Thermal Hydraulics, Representative from Westinghouse to be determined

THURSDAY, NOVEMBER 14, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration

8:00 a.m. - 11:30 a.m. 2013 SMR Meeting: Technical Sessions

- SMR PRA Advances and Challenges
- US Government Stewardship of Public Lands/Hosting of SMR/Energy Security Services

1:00 p.m. - 4:30 p.m. 2013 SMR Meeting: Technical Sessions

- SMR Simulators/Control Room Design/Staffing and Human Factors
- SMR Manufacturing/Modular Construction Processes
- International SMR Development–Papers/Panel

THURSDAY, NOVEMBER 14, 2013, 8:00 A.M.

SMR PRA ADVANCES AND CHALLENGES–PANEL

Sponsored by OPD

Session Organizer: Mohammad Modarres (Univ of Maryland)

This session discusses risk assessment, insights and risk management processes into the design and licensing of SMRs. Designers and analysts will discuss their experiences associated with performing Probabilistic Risk Assessment (PRA) of the SMR designs and incorporating PRA process into designs, design and licensing activities. Challenges facing the use of PRA for SMRs include multi-module and site risk issues, reliability assessment of passive safety systems, SMR unique equipment and structures, relevance of failure and performance data from operating reactors, human reliability analysis, performance and reliability of in-vessel structures and equipment such as steam generators and control rod drive mechanisms, module-to-module interactions, and common cause failure.

PANELISTS:

- Overview of NRC Regulatory and Research Activities, L. Mrowca / K. Coyne (NRC)
- Overview of NEI Activities and Positions, Victoria Anderson/Biff Bradley (NEI)
- mPower PRA Experiences, Tom Morgan (Maracor)
- SMART PSA Experiences, Young-Ho Jin (KAERI)
- NuScale PRA Experiences, Bill Galyean (NuScale Power)
- Fukushima Lessons and Their Implications on SMRs, William Reckley (NRC)
- PRA Challenges with Multi-Module SMRs, M. Modarres (Univ of Maryland)

US GOVERNMENT STEWARDSHIP OF PUBLIC LANDS /HOSTING OF SMR /ENERGY SECURITY SERVICES–PANEL

Sponsored by OPD; cosponsored by DESD

Session Organizer: Ron S. Faibish (ANL)

There have been calls for government agencies, such as the DOE and the DoD to explore power purchasing arrangements from SMRs to provide electricity to federal facilities (e.g., national lab complexes, military bases, supercomputer facilities, and other vital infrastructure), while also having the option of providing electricity to the surrounding communities through the grid. Some have also called for siting SMRs on federal lands for the same purposes. Proponents cite energy security and energy independence as reasons for doing so. Panelists will explore these options and specific design, licensing, construction, operation, and economic considerations.

PANELISTS:

Opening Remarks by Chair and speaker introductions
Ron Faibish (ANL)

- Maureen Koetz, (Koetz-Duncan, LLC)
- Mark Campagna, (MCarl's LLC)
- Jack Meyer (SRS)
- Representative from DOD to be determined
- Representative from DOE to be determined

THURSDAY, NOVEMBER 14, 2013, 1:00 P.M.

SMR SIMULATORS/CONTROL ROOM DESIGN/STAFFING AND HUMAN FACTORS

Sponsored by OPD

Session Organizer: Richard T. Wood (ORNL)

Control room staffing for SMRs is a significant technical and regulatory issue that has not been definitively resolved. At traditional staffing levels, personnel costs on a per megawatt basis for SMRs would be significantly higher than for existing large reactors. Timely development of SMR plant simulators is necessary to establish a comprehensive technical basis to justify reduced staffing levels. This panel session will discuss the status of simulator development for current iPWR designs as well as key control room design and staffing considerations.

PANELISTS:

Opening Remarks by Chair and speaker introductions
Richard Wood (*ORNL*)

- Mike Sontag (*Generation mPower*)
- Ross Snuggerud (*NuScale*)
- Representative from Holtec to be determined
- Representative from Westinghouse to be determined

SMR MANUFACTURING/MODULAR CONSTRUCTION PROCESSES

Sponsored by OPD

Session Organizer: Jim Moody (*General Dynamics Electric Boat*)

Fulfilling the promise of small modular reactor deployment will be highly dependent on the methods and processes used to design, manufacture, assemble and construct the components and plants. This panel will explore issues associated with building initial units, building follow-on units, and the potential to reduce schedule, cost, and risk through area-based design and modularization. The panelists will represent companies involved in nuclear manufacturing and in academic research with the ability to share lessons learned and their thoughts of needed actions.

PANELISTS:

Opening Remarks by Cochairs and speaker introductions
Jim Moody (*General Dynamics Electric Boat*)

- Garrick Solovey (*Precision Custom Components*)
- Nigel Town (*Rolls-Royce*)
- Jim Moody (*General Dynamics Electric Boat*)
- Ron Beck (*Bechtel*)
- Representative from Westinghouse to be determined
- Representative from DOE to be determined

INTERNATIONAL SMR DEVELOPMENT—PAPERS/PANEL

Sponsored by OPD

Session Organizer: Pareez Golub (*EXCEL Services Corp*)

SMR Fast Reactors as a Solution for Future Small-Scale Nuclear Energy, Anna V. Kudryavtseva, Kirill Danilenko (*Basic Element*)

Use of Grading in Safety Cases for Reactor Facilities in Canada, Marcel Marinus de Vos (*Canadian Nucl Safety Comm*)

Should Licensing Process Be Modified for SMRs, European Perspective., Kristiina Katri Soderholm (*Fortum*)

IAEA Safeguards in New Nuclear Facilities, James Kent Sprinkle (*IAEA–Austria*), Karyn Rebecca Durbin (*DOE NNSA*), Elina Martikka (*STUK*), Andrew Catton, Cristina Ciuculescu, Rebecca Stevens, Neil Fairbairn Tuley, Stephanie Poirier (*IAEA–Austria*)

PANEL DISCUSSION

International interest in SMRs is growing rapidly as evidenced by the number of designs that are complete or are under development. Many countries that do not have the electric grid infrastructure or capital to invest in large reactors have expressed interest in deploying SMRs. In addition, many countries with established nuclear power programs have expressed interest in deploying SMRs in locations that may not be suitable for large reactors or for economic reasons. The panel will explore the fit between SMRs and global markets for new electric generation capacity, from the standpoint of technology, economics, and regulatory factors. It will also explore how SMRs designed/certified in one country could be licensed/constructed/operated in another country. There will be a report on the results of the July 2013 IAEA meeting on licensing and safety issues for SMRs.

PANELISTS:

Opening Remarks by Chair and speaker introductions
Pareez Golub (*EXCEL*)

- Anna Kudryavtseva (*Basic Element*)
- Marcel De Vos (*Canadian Nuclear Safety Commission*)
- Kristiina Soderholm (*Fortum*)
- Representative from IAEA to be determined

Embedded Topical Meeting: *Nuclear Nonproliferation – First Fission to the Future*



GENERAL CHAIR:
John E. Gunning
Oak Ridge National Laboratory

TECHNICAL PROGRAM CO-CHAIR:
Jeffrey A. Chapman
Oak Ridge National Laboratory/ORNL



TECHNICAL PROGRAM CO-CHAIR:
R. Chris Robinson
Y-2 National Security Complex

TUESDAY, NOVEMBER 12, 2013

- 7:30 a.m. - 5:00 p.m. **Meeting Registration**
- 8:00 a.m. - 10:00 a.m. **Spouse/Guest Hospitality**
- 8:00 a.m. - 11:30 a.m. **2013 Nuclear Nonproliferation: Opening Plenary**
- First Fission to the Future: A Reflection and Projection on Nuclear Nonproliferation
- 1:00 p.m. - 4:30 p.m. **2013 Nuclear Nonproliferation: Technical Sessions**
- Nuclear Security Summit Process from 2010-2016—Panel

TUESDAY, NOVEMBER 12, 2013, 8:00 A.M.

OPENING PLENARY: FIRST FISSION TO THE FUTURE: A REFLECTION AND PROJECTION ON NUCLEAR NONPROLIFERATION

Sponsored by NNTG

Session Organizer: Joyce L. Connery (*National Security Council*)

INVITED SPEAKERS:

- Laura Holgate (*Senior Director, National Security Council*)
- Rose Gottemoeller (*Undersecretary for Arm Control and International Security*)
- Andrew Weber (*Assistant Secretary of Defense for Nuclear, Chemical and Biological Defense*)

TUESDAY, NOVEMBER 12, 2013, 1:00 P.M.

NUCLEAR SECURITY SUMMIT PROCESS FROM 2010-2016—PANEL

Sponsored by NNTG

Session Organizer: Joyce L. Connery (*National Security Council*)

In 2009 President Obama, in his groundbreaking Prague speech, called nuclear terrorism one of the greatest threats to international security. The chance of terrorists carrying out an attack with nuclear material is slight, but if it happened, the consequences would be enormous. For this reason the U.S. mounted a global four year effort to secure vulnerable nuclear materials worldwide. With this in mind, the first Nuclear Security Summit (NSS) was organized in Washington, DC; a second summit followed in Seoul in 2012. The Netherlands will be hosting the Nuclear Security Summit in The Hague on March 24 and 25, 2014, and President Obama announced on June 19 in Berlin his intention to host a nuclear security summit here in the U.S. in 2016. In conjunction with each Summit, the international NGO community and the international nuclear industry held parallel events to support the goals of the Summits.

This panel will review the specific objectives of the last two Summits, what was successfully accomplished and what was not. A preview of the 2014 NSS will be presented and what its objectives will be, the challenges facing it, and how those challenges might be met. Finally, the panel will discuss the future of the Summit process and how to sustain the momentum on the issue of nuclear security.

Panelists include: National Security Council representative, Korean Embassy representative, Dutch Embassy representative, NGO representative, and Industry representative.

PANELISTS:

- Melissa Krupa (*National Security Council representative*)
- Korean Embassy representative to be determined
- Dutch Embassy representative to be determined
- Corey Hinderstein (*NGO representative*)
- Jack Edlow (*Industry representative*)

SMR Nonproliferation and Security

See SMR, page 52

WEDNESDAY, NOVEMBER 13, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration

8:00 a.m. - 11:30 a.m. 2013 Nuclear Nonproliferation:
Opening Plenary

- Isotopes and Radiation: Applications to Nuclear Security
- The Role and Importance of Policy in Our Nuclear World—Panel

1:00 p.m. - 4:30 p.m. 2013 Nuclear Nonproliferation:
Technical Sessions

- Technical Challenges and Solutions—Panel

WEDNESDAY, NOVEMBER 13, 2013, 8:00 A.M.

ISOTOPES AND RADIATION: APPLICATIONS TO NUCLEAR SECURITY

Sponsored by IRD; cosponsored by YMG

Session Organizer: Stephen P. LaMont (LANL)

Nuclear Forensic Examination of Historic Materials from an Abandoned Uranium Rolling Mill, Lisa Meyers (*Univ of Cincinnati*), Ross W. Williams (*LLNL*), Samuel E. Glover, Apryll M. Stalcup, Henry B. Spitz (*Univ of Cincinnati*), Stephen Philip LaMont (*LANL*), invited

Uranium Contaminant Dissolution in Simulated Lung Fluid And Pulmonary Surfactant, Grant M. Spitler, Henry B. Spitz, James Bowen (*Univ of Cincinnati*), invited

Environmental Mobility of Plutonium Particles, James M. Bowen, Samuel Glover, Henry Spitz (*Univ of Cincinnati*), Stephen LaMont (*LANL*), invited

Affect of Emission Controls on the Elemental Concentration and Particle Size of Coal Ash, Todd Praechter, Henry Spitz (*Univ of Cincinnati*), invited

Utilization of Wavelet Transforms for Denoising Fission Product Radionuclide Spectra, Steven R. Biegalski (*Univ of Texas, Austin*), invited

Aerosol Filter Sample Inhomogeneity in Samples with Debris from the Fukushima Daiichi Nuclear Accident, Reynaldo Gomez (*Univ of Texas, Austin*), invited

Inverse Radiation Transport Problem Stability Analysis, David Anderson, John Mattingly (*NCSU*)

Passive Gamma Spectrometry of Low-Volatile FPs for Accountancy of Special Nuclear Material in Molten Core Material of Fukushima Daiichi Nuclear Power Plant-Numerical Simulation of Leakage Gamma-ray from Molten Core Materials in Hypothetical Canister, Hiroshi Sagara, Tomooki Shiba (*Tokyo Inst Technol*), Hirofumi Tomikawa, Akihiro Ishimi, Kei-ichiro Hori (*JAEA-Japan*), Masaki Saito (*Tokyo Inst Technol*)

Special Nuclear Material Resources at INL to Support Nuclear Nonproliferation R & D, David L. Chichester, Jeff Sanders, Jennifer A. Turnage, James D. West, Mary Anne Willmore, Craig K. Wise (*INL*)

THE ROLE AND IMPORTANCE OF POLICY IN OUR NUCLEAR WORLD—PANEL

Sponsored by NNTG

Session Organizer: James W. Behrens (*US Navy, Retired*)

The ANS Nuclear Nonproliferation Technical Group (NNTG) was established in mid-2011. Prior to that date, it existed as an ANS Special Committee. Though separate, policy and technology are, in fact, complementary, and both are necessary to ensure our nation's success in matters of energy supply, national security and international relations. Panelists will discuss the various ways in which policy and technology walk hand-in-hand in forming a safer and secure world in which to live. Specific topics of interest to the ANS membership will include, but will not be limited to, matters of nuclear safety and security; nuclear safeguards; nuclear arms control and international negotiations (including nuclear nonproliferation), and matters regarding the nuclear fuel cycle.

PANELISTS:

- Steve Nesbit (*Duke Energy*)
- Craig Piercy (*ANS Washington Representative*)
- John C. Browne (*LANL, retired*)
- James W. Behrens (*U.S. Navy, retired*)
- Gene Carpenter (*NRC*)
- Doug Shaw (*GW*)

WEDNESDAY, NOVEMBER 13, 2013, 1:00 P.M.

TECHNICAL CHALLENGES AND SOLUTIONS—PANEL

Sponsored by NNTG

Session Organizer: Alan S. Icenhour (*ORNL*)

Nuclear nonproliferation efforts face a wide range of challenges. These efforts must be able to address proliferation concerns emerging from individual actors, transnational networks, and nation states; and they must be sustained into the future. Technology development and deployment plays a vital role in the implementation of nuclear nonproliferation requirements and agreements. However, technology must be applied in the context of a policy framework. This panel session will explore technical challenges and solutions in terms of policy implementation. Representatives of government, national laboratories, and academia will provide insights from different perspectives, which will include policy development, the identification of technology requirements, development and deployment of technology, and the long-term sustainment of nonproliferation objectives.

EMBEDDED TOPICAL MEETING: NUCLEAR NONPROLIFERATION: WED/THURS

PANELISTS:

- Julie A. Bentz (*National Security Staff*)
- Cindy Atkins-Duffin (*Office of Science and Technology Policy*)
- Rhys Williams (*NNSA*)
- Larry Satkowiak (*ORNL*)
- Nancy Jo Nicholas (*LANL*)
- Howard Hall (*UTK*)

WEDNESDAY, NOVEMBER 13, 2013, 4:00 P.M.

STUDENT SHOWCASE NUCLEAR NONPROLIFERATION TECHNOLOGY AND POLICY—POSTER SESSION

Sponsored by NNTG; cosponsored by IRD/YMG

Session Organizer: Howard L. Hall (*Univ of Tennessee*)

A poster session with presentations by students.

THURSDAY, NOVEMBER 14, 2013

7:30 a.m. - 5:00 p.m. Meeting Registration

8:00 a.m. - 11:30 a.m. 2013 Nuclear Nonproliferation:
Technical Sessions

- University Programs for Nuclear Security Education—I: General—Panel
- University Programs for Nuclear Security Education—II: Highlighting the International Nuclear Security Education Network—Panel
- Uranium Management and Impending Conversion Needs in the U.S.—Panel
- Holistic Nuclear Security: Culture at Every Level—Panel

1:00 p.m. - 4:30 p.m. 2013 Nuclear Nonproliferation:
Technical Sessions

- University Programs in Nuclear Nonproliferation: Curriculum Development, Research, and Careers—Panel
- Tools for Nuclear Nonproliferation—Panel
- Nuclear Energy Development in the Middle East and North Africa: Strategies for Security, Safeguards and Non-Proliferation—I—Panel
- Nuclear Energy Development in the Middle East and North Africa: Strategies for Security, Safeguards and Non-Proliferation—II—Panel

THURSDAY, NOVEMBER 14, 2013, 8:00 A.M.

UNIVERSITY PROGRAMS FOR NUCLEAR SECURITY EDUCATION—I: GENERAL—PANEL

Sponsored by NNTG

Session Organizer: Rian Bahran (*LANL*)

This past decade of global nuclear energy expansion has led to a revival of nuclear engineering education domestically and internationally. In the United States alone, enrollment in nuclear engineering departments has almost tripled over the past half-decade. This resurgence in nuclear engineering education has been accompanied by a widespread increase of nuclear security educational programs and partnerships. This session will provide an overview of the current status of different nuclear security university programs in the United States and abroad.

PANELISTS:

- Howard Hall (*Univ of Tennessee*)
- Shaheen Dewji (*ORNL*)
- Steve Skutnik (*Univ of Tennessee*)
- Adam Hecht (*Univ of New Mexico*)
- Masaki Saito (*Tokyo Inst of Technology*)
- Oum Keltoum Bouhelal (*National School of Mineral Industry of Morocco*)
- Jim Doyle (*LANL*)

UNIVERSITY PROGRAMS FOR NUCLEAR SECURITY EDUCATION—II: HIGHLIGHTING THE INTERNATIONAL NUCLEAR SECURITY EDUCATION NETWORK—PANEL

Sponsored by NNTG

Session Organizer: Rian M. Bahran (*RPI*)

Nuclear security is an important global issue with many universal challenges and solutions. The International Nuclear Security Network (INSN) is an international program that aims to enhance global nuclear security by developing, sharing, and promoting excellence in nuclear security education. This session will explore the successes of the international nuclear security education network and highlight best practices.

PANELISTS:

- Jason Harris (*Idaho State Univ*)
- Chris Hobbs (*King's College of London*)
- Oum Keltoum Hakam (*Univ of Tofail in Morocco*)
- James Larkin (*Univ of Witwatersrand in South Africa*)
- Khammar Mrabit (*IAEA*)
- Alexander Solodov (*Khalifa Univ in UAU*)
- Oum Keltoum Bouhelal (*National School of Mineral Industry of Morocco*)

URANIUM MANAGEMENT AND IMPENDING CONVERSION NEEDS IN THE U.S.—PANEL

Sponsored by NNTG

Session Organizer: R. Chris Robinson (Y-12 NSC)

A large majority of the emerging advanced reactor designs (Gen IV reactors) require uranium with enrichments between 10% and 20%. Although classified as low enriched uranium (LEU), there is not a commercial supply chain available to provide uranium with enrichments above 5%. These reactor designers are struggling to identify investors just to support the design, licensing, and initial construction of their reactor concepts. With the significant projected cost to build and license the facilities needed to enrich the uranium to the levels required to fabricate their fuel, their costs could be such that it would be prohibitive to ever build the first advanced reactor. A common belief is these needs can and will be met through the U.S. Surplus Highly Enriched Uranium (HEU) Disposition Program; however, as the demand rises for high assay (>5%) LEU, the current allocated supply for all national security requirements will not be sufficient long-term. Additional material could be designated for down-blending; however, this impacts other national security programs and is only a short-term solution. Panelists will discuss all aspects of this complicated and highly important issue for advanced reactors and the impacts on national security. Both private and government experts will be represented on the panel.

PANELISTS:

- Morris Hassler (Y-12 National Security Complex)
- Kirk Schnobelen (Urenco, Inc.)
- Xavier Ascanio (NNSA)
- Tom Sanders (SRNL)
- William Szymanski (Uranium Management and Policy, Office of Nuclear Energy, NE-54)
- Representative from DOE to be determined
- Richard Goorevich (NNSA)
- Roger Reynolds (TerraPower, L.L.C.)

HOLISTIC NUCLEAR SECURITY: CULTURE AT EVERY LEVEL—PANEL

Sponsored by NNTG

Session Organizer: Scott Bruce (CRDF Global)

Protecting nuclear and radioactive materials is a responsibility shared by everyone in the nuclear industry, from policymakers and regulators to facility managers and the general workforce. A robust nuclear security culture requires buy-in at every level.

To develop a holistic understanding and approach to the subject, this panel discussion will feature views on nuclear security culture from industry, international organizations, and government. Specifically, panelists will describe their experiences developing, incorporating, and maintaining nuclear security culture at facilities in industry and in government, both in the U.S. and abroad, and in promoting nuclear security culture internationally. The dialogue will emphasize the need to build and reinforce a culture of nuclear security throughout the breadth and depth of the nuclear community.

PANELISTS:

- U.S. Department of State Representative (Partnership for Nuclear Security) to be determined
- Ruth Duggan (SNL)
- Sunday Jonah (Ahmadu Bello Univ)
- Joseph Rivers (NRC)
- Joseph Stainbeck (Y-12 National Security Complex)

THURSDAY, NOVEMBER 14, 2013, 1:00 P.M.

UNIVERSITY PROGRAMS IN NUCLEAR NONPROLIFERATION: CURRICULUM DEVELOPMENT, RESEARCH, AND CAREERS—PANEL

Sponsored by NNTG

Session Organizer: Craig Williamson (SCUREF)

The Next Generation Safeguards Initiative (NGSI) has generated support for the development of a highly educated, knowledgeable, and skilled workforce in enhancing existing technologies and developing new ones for nuclear nonproliferation. This movement has created new and revised courses at several universities throughout the United States. In addition, it has necessitated the development of stronger collaborative ties between the universities and the nation's laboratories engaged in nonproliferation. This session will provide an overview of these developments.

PANELISTS:

- Richard Lanza (MIT)
- Sara Pozzi (Univ of Michigan)
- John Mattingly (NCSU)
- Kathryn A. Higley (Oregon State Univ)
- William S. Charlton (Texas A&M Univ)
- Howard Hall (Univ of Tennessee)
- Mark A. Pierson (Virginia Tech)
- Tim DeVol (Clemson Univ)
- Steven Bigelaski (Univ of Texas)
- John Gahl (Univ of Missouri)
- Kenan Unlu (Penn State Univ)

TOOLS FOR NUCLEAR NONPROLIFERATION—PANEL

Sponsored by NNTG

Session Organizer: Matthew J. Gidden (*Univ of Wisconsin, Madison*)

The complex challenges inherent to safeguarding the nuclear fuel cycle reflect its diverse nature, spanning a wide range of activities from initial mining to enrichment, irradiation, storage, reprocessing, and disposal, each requiring unique tools for verification. This panel session brings together experts from a broad range of expertise to discuss the development and use of modern tools for nuclear nonproliferation, including technology, inspections, and intelligence, and in particular their combined application to advance global nonproliferation goals.

PANELISTS:

- Brian Boyer (*LANL*)
- Michael Whitaker (*ORNL*)
- Young Ham (*LLNL*)
- Stephen Croft (*ORNL*)
- Bill Charlton (*TAMU*)
- Kris Wheaton (*Mercyhurst*)
- David Chichester (*INL*)

NUCLEAR ENERGY DEVELOPMENT IN THE MIDDLE EAST AND NORTH AFRICA: STRATEGIES FOR SECURITY, SAFEGUARDS AND NON-PROLIFERATION—I—PANEL

Sponsored by NNTG

Session Organizer: Rian M. Bahran (*RPI*)

In order to meet its fast-growing domestic energy needs, the United Arab Emirates has positioned itself to become the first Arab country (by the end of the decade) to deliver electricity to their national grid by means of nuclear power. The Kingdom of Saudi Arabia also plans to construct 16 nuclear power reactors over the next 20 years. Other countries in the Middle East including the State of Bahrain, the Sultanate of Oman, the State of Qatar, the State of Kuwait, Turkey, Egypt, Algeria, Libya, Jordan, Morocco, and Yemen have publicly expressed interest in pursuing nuclear technology for generating electricity and water desalination purposes. This nuclear renaissance in the Middle East and North Africa (MENA) is coinciding with sweeping reforms and changes in the political topology of the region. This panel is aimed at exploring the political, technical, and market challenges to the development of nuclear power MENA in the context of non-proliferation, safeguards and security.

PANELISTS:

- Khammar Mrabit (*IAEA*)
- Laban Coblentz (*Former Speechwriter and Communication Adviser to IAEA Director General ElBaradei*)
- Sameh Aboul-Enein (*AUC*)
- Amir H. Mohagheghi (*SNL*)
- Mohamed AlHarbi (*UAE Federal Authority Nuclear Regulation*)

NUCLEAR ENERGY DEVELOPMENT IN THE MIDDLE EAST AND NORTH AFRICA: STRATEGIES FOR SECURITY, SAFEGUARDS AND NON-PROLIFERATION—II—PANEL

Sponsored by NNTG

Session Organizer: Rian M. Bahran (*RPI*)

PANELISTS:

- Ambassador Thomas Graham, Jr, (*Lightbridge UAE Nuclear Energy International Advisory Board*)
- Maryam Qasem (*Emirates Nuclear Energy Corporation*)
- Chris Hobbs or Mathew Moran (*King's College of London*)
- Khaled Alahmed or Ismail Zabeeba (*Yemen National Atomic Energy Commission (NATEC)*)
- Abdulmajid Mahjoub (*Arab Atomic Energy Agency*)

Embedded Topical Meeting: *Young Professionals Congress 2013*



GENERAL CHAIR:
Gale Hauck
Westinghouse Electric Company



PROGRAM CHAIR:
Peter Shaw
Westinghouse Electric Company

SATURDAY, NOVEMBER 9, 2013

8:30 a.m. - 11:30 a.m.

Young Professionals Congress 2013: Technical Sessions

- Exchanging Ideas: How to Communicate Effectively
- Work-Life Balance
- Must be the Money

1:00 p.m. - 6:30 p.m.

Young Professionals Congress 2013: Technical Sessions

- Project Management - It's Just Common Sense, Right?
- Going It Alone: The Path to an Independent Energy Policy
- First Steps: A Management Crash Course
- There and Back Again
- Getting the Most Out of ANS
- Voice of the Young Generation

SATURDAY, NOVEMBER 9, 2013, 8:30 A.M.

EXCHANGING IDEAS: HOW TO COMMUNICATE EFFECTIVELY

Session Organizer: Peter Shaw (Senior Licensing Engineer, Westinghouse)

Young members are coming to ANS from many different parts of the nuclear science and technology community. These perspectives mean that there are different approaches to communication between these individuals. This session centers around giving young members the tools they need to communicate with each other effectively.

PANELISTS:

- Steve Nesbit (*Nuclear Policy and Support, Duke Energy*)
- Rita Baranwal (*Director Core Engineering, Westinghouse*)
- Liz Ramsay (*Nuclear Energy Policy Advisor, Department of Energy*)

WORK-LIFE BALANCE

Session Organizer: Allison Miller (Nuclear Engineer Member of Technical Staff, Sandia National Lab)

When first entering your professional career the balance between work and personal life is difficult. The panelists will be providing tips and perspective to find a strong work-life balance while still achieving your career goals.

PANELISTS:

- Allison Miller (*Nuclear Engineer Member of Technical Staff, Sandia National Lab*)
- Lenka Kollar (*Nonproliferation Technical Associate, Argonne National Laboratory*)
- Rian Bahrn (*Post-Doctoral Research Associate, Los Alamos National Laboratory*)
- Shaheen Dewji (*Safeguards and Security Technology, Oak Ridge National Laboratory*)

MUST BE THE MONEY

Session Organizer: Bristol Hartlage (Manager Obsolescence Programs, Curtiss Wright)

Does the idea of approaching your manager for approval to attend a conference or training course make you queasy? Although it may seem like it's determined by random chance, getting company approval to further your professional development is within your control. This session will show you how to make your case.

PANELISTS:

- Julio Adame (*West Regional Director of Sales, Enertech*)
- Heather Daniel Manager (*Business Development, Lockheed Martin*)

SATURDAY, NOVEMBER 9, 2013, 1:00 P.M.

PROJECT MANAGEMENT -IT'S JUST COMMON SENSE, RIGHT?

Session Organizer: Bristol Hartlage (Manager Obsolescence Programs, Curtiss Wright)

You've been assigned as a technical lead or coordinator on a project. Surprise! You're now a project manager. You have two options - learn it the hard way, or get yourself some PM training. This panel will cover the basics, help you apply the knowledge at work and home, and will provide information on professional licensure.

PANELISTS:

- Jamie Lehto (*EMALS Test Manager, General Atomics*)
- Nicholas Wyckoff (*TO16 Project Lead, Boeing*)
- Laura Farrell (*Equipment Obsolescence Project Lead, Constellation*)

GOING IT ALONE: THE PATH TO AN INDEPENDENT ENERGY POLICY

Session Organizer: Cory Stansbury (Senior Engineer, Westinghouse)

Do you watch the news and shake your head at the "independent energy solutions" thrust upon us by politicians and lobbyists? Do you think to yourself, "I could do so much better than that!"? Well now is your chance. Come join the National Energy Policy Panel Discussion at YPC 2013 and let your voice be heard.

PANELISTS:

- Ben Heard (*Director, Think Climate Consulting*)
- Michael Shellenberger (*President, The Breakthrough Institute*)

FIRST STEPS: A MANAGEMENT CRASH COURSE

Session Organizer: Ben Holtzman (Senior Engineer, Westinghouse)

Are you interested in becoming a manager, or a new manager Westinghouse looking to make some improvements? Resource management requires a different set of skills than other professional positions and often raises new challenges for first time managers. This session will cover "everything I wish knew before I became a manager."

PANELISTS:

- Duncan Robinson (*Engineering Supervisor, Constellation*)
- Liz McAndrew- Benavides (*Manager, NEI*)

THERE AND BACK AGAIN

Session Organizer: Peter Shaw (Senior Licensing Engineer, Westinghouse)

As young members enter the industry, they are faced with difficulty communicating their ideas and goals effectively with people from an older generation. Without effective communication, there is the potential for useful information to be lost from both sides of the discussion. Young members often have new ideas and approaches to problems, while more senior individuals have perspective from their experience. This session will offer techniques and strategies for effective communication.

PANELISTS:

- Angie Howard (*President, Howard – Johnson Associates*)
- David Pointer (*Technical Lead, Oak Ridge National Laboratory*)
- Laura Hermann (*Sr Vice President, Potomac Communications Group*)
- Andy Cook (*Senior VP OE and Innovation, Areva*)

GETTING THE MOST OUT OF ANS

Session Organizer: Art Wharton (Project Manager, Westinghouse)

ANS meetings can be very large and busy. As a young professional it can be daunting showing up at your first ANS meeting, or even your 5th. This panel will go over the organizational structure of ANS, what typically happens at an ANS meeting, and how you can get the most out of attending an ANS conference.

PANELISTS:

- Gale Hauck (*Product Manager, Westinghouse*)
- Eric Loewen (*Chief Engineer General Electric*)

VOICE OF THE YOUNG GENERATION

Session Organizer: Gale Hauck (Project Manager, Westinghouse)

This is your chance to bring up topics of concern, discuss the future, and make your voice heard.

COMMITTEE MEETINGS

NATIONAL COMMITTEES

ACCREDITATION, POLICES & PROCEDURES

SUNDAY, 11 AM - 12 PM

BOARD OF DIRECTORS

PROFESSIONAL DIVISION REPORTS
WEDNESDAY, 4 PM - 5:30 PM

ANS BOD

THURSDAY, 7:30 AM - 2 PM

BYLAWS & RULES

SUNDAY, 4:30 PM - 6 PM

FED COMMITTEE

SUNDAY, 3 PM - 5 PM

FINANCE COMMITTEE MEETING

TUESDAY, 2 PM - 7 PM

HONORS & AWARDS

MONDAY, 4 PM - 6 PM

INTERNATIONAL COMMITTEE

SUNDAY, 11:30 AM - 2:30 PM

LOCAL SECTION WORKSHOP

SUNDAY, 8 AM - 12 PM

MEMBERSHIP

SUNDAY, 11 AM - 12 PM

NATIONAL PROGRAM COMMITTEE

NPC SCREENING & INTERNATIONAL
SUNDAY, 10 AM - 12 PM

NPC NATIONAL MEETING SUB
COMMITTEE
WEDNESDAY, 11:30 AM - 1 PM

NPC PROGRAM

WEDNESDAY, 4 PM - 6:30 PM

NEED COMMITTEE

SUNDAY, 7:30 PM - 9:30 PM

PROFESSIONAL ENGINEERING EXAM COMMITTEE (PEEC)

PEEC ITEM WRITERS GROUP
SATURDAY, 5 PM - 10 PM

PEEC COMMITTEE MTG
SUNDAY, 3 PM - 4:30 PM

PEEC BUSINESS MEETING
SUNDAY, 3 PM - 5 PM

PLANNING COMMITTEE

SUNDAY, 2 PM - 6 PM

PRESIDENT'S MEETING w/ COMMITTEE CHAIRS

SUNDAY, 8 AM - 9 AM

PRESIDENT'S MEETING w/ DIVISION CHAIRS

SUNDAY, 9 AM - 10 AM

PROFESSIONAL DEVELOPMENT COORDINATION COMMITTEE

TUESDAY, 4:00 PM - 5:00 PM

PROFESSIONAL DIVISIONS

TRAINING WORKSHOP
SATURDAY, 5 PM - 6:30 PM

COMMITTEE MEETING
WEDNESDAY, 5:30 PM - 7 PM

PROFESSIONAL WOMEN IN ANS (PWANS)

MONDAY, 11:30 AM - 12:30 PM

PUBLIC INFORMATION COMMITTEE

SUNDAY, 4 PM - 6 PM

PUBLIC POLICY

WEDNESDAY, 11:30 AM - 1:30 PM

PUBLICATIONS STEERING

MEETINGS, PROCEEDINGS &
TRANSACTIONS
SUNDAY, 9 AM - 10 AM

BOOK PUBLISHING
SUNDAY, 11 AM - 12:30 PM

NS&E EDITORIAL ADVISORY
SUNDAY, 11 AM - 12 PM

TECHNICAL JOURNALS
SUNDAY, 1 PM - 4 PM

NT EDITORIAL ADVISORY
SUNDAY, 4:30 PM - 5:30 PM

NUCLEAR NEWS EDITORIAL
ADVISORY
SUNDAY, 4 PM - 5:30 PM

PUBLICATION STEERING COMMITTEE
MONDAY, 4:30 PM - 6:30 PM

SCHOLARSHIP POLICY & COORDINATION

MONDAY, 12 PM - 1 PM

STUDENT SECTIONS

EXECUTIVE
MONDAY, 6 PM - 7 PM

REPORTS
MONDAY, 7 PM - 8 PM

SPECIAL COMMITTEES

SPECIAL COMMITTEE INTEGRATION
OVERSIGHT
TUESDAY, 9 AM - 11 AM

SPECIAL COMMITTEE ON
GOVERNMENT RELATIONS
TUESDAY, 1:30 PM - 3 PM

OTHER COMMITTEES

8iCi ORGANIZING COMMITTEE

MONDAY, 4 PM - 5:30 PM

20TH PBNC ORGANIZING COMMITTEE

MONDAY, 4 PM - 5 PM

CNF MEETING

MONDAY, 7 PM - 10 PM

CSSG

THURSDAY, 1 PM - 4 PM

EAGLE ALLIANCE BOD

SUNDAY, 1 PM - 3 PM

FELLOWS POLICY ROUNDTABLE

WEDNESDAY, 8 AM - 11:30 AM

INSC BUSINESS MEETING

SATURDAY, 3 PM - 6 PM

INEA

TUESDAY, 4PM - 6PM

JOINT BENCHMARK COMMITTEE WORKSHOP

SATURDAY, 6 PM - 9 PM

KNS MEETING

MONDAY, 4:30 PM - 6 PM

MATHEMATICS & COMPUTATION/ REACTOR PHYSICS/RADIATION PROTECTION & SHIELDING

JOINT BENCHMARK MEETING
SUNDAY, 11 AM - 1 PM

NEDHO

SUNDAY, 4 PM - 6 PM

NURETH-15

TUESDAY, 6 PM - 8 PM

PACIFIC NUCLEAR COUNCIL (PNC)

MONDAY, 8:30 AM - 5 PM

PSA 2014 PLANNING MEETING

MONDAY, 5:30 PM - 7:30 PM

RISK MANAGEMENT 2014 ORGANIZING COMMITTEE

MONDAY, 6:30 PM - 8:30 PM

UWC 2014 PLANNING COMMITTEE

SUNDAY, 11:30 AM - 12:30 PM

DIVISION COMMITTEES

ACCELERATOR APPLICATIONS -
EXECUTIVE

MONDAY, 11:30 AM - 1:30 PM

AEROSPACE NUCLEAR SCIENCE & TECHNOLOGIES (ANSTD)

SUNDAY, 12 PM - 2 PM

BIOLOGY AND MEDICINE

COMPUTATIONAL MEDICAL PHYSICS
WORKING GROUP

SUNDAY, 10 AM - 11 AM

JOINT PROGRAM COMMITTEE-
I&R/BM

SUNDAY, 1:30 PM - 2:30 PM

COMMITTEE OF THE WHOLE
SUNDAY, 4 PM - 5:30 PM

DECOMMISSIONING AND ENVIRONMENTAL SCIENCE

PROGRAM
SUNDAY, 8:30 AM - 9:30 AM

EXECUTIVE
SUNDAY, 10 AM - 12 PM

NUCLEAR PRODUCTION OF
HYDROGEN WORKING GROUP
SUNDAY, 12 PM - 1 PM

SPECIAL COMMITTEE ON
SUSTAINABILITY OF
NUCLEAR ENERGY
SUNDAY, 1 PM - 3 PM

PROGRAM COMMITTEE MEETING
SUNDAY, 3:30 PM - 4:30 PM

EXECUTIVE COMMITTEE MEETING
SUNDAY, 4:30 PM - 5:30 PM

EDUCATION, TRAINING & WORKFORCE DEVELOPMENT

UNIVERSITY/INDUSTRY/
GOVERNMENT RELATIONS
SUNDAY, 9:30 AM - 10:30 AM

PROGRAM
SUNDAY, 10:30 AM - 12 PM

ALPHA SIGMA NU
SUNDAY, 1 PM - 2 PM

EXECUTIVE/MEMBERSHIP/HONORS
& AWARDS
SUNDAY, 1:30 PM - 4:30 PM

FUEL CYCLE & WASTE MANAGEMENT

PROGRAM
SUNDAY, 12 PM - 1 PM

EXECUTIVE
SUNDAY, 1 PM - 2:30 PM

TECHNICAL OPERATING &
STANDARDS COMMITTEE
SUNDAY, 2:30 PM - 3:30 PM

FUSION ENERGY

EXECUTIVE
SUNDAY, 3 PM - 5 PM

HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS

PROGRAM
SUNDAY, 11 AM - 12 PM

EXECUTIVE
SUNDAY, 12 PM - 2:30 PM

ISOTOPES AND RADIATION

JOINT PROGRAM COMMITTEE-
I&R/BM
SUNDAY, 1:30 PM - 2:30 PM

EXECUTIVE
SUNDAY, 2:30 PM - 4 PM

MATHEMATICS & COMPUTATION

COMPUTATIONAL MEDICAL PHYSICAL
WORKING GROUP
SUNDAY, 10 AM - 11 AM

PROGRAM
SUNDAY, 1 PM - 2 PM

EXECUTIVE
SUNDAY, 2 PM - 4 PM

MATERIALS SCIENCE AND TECHNOLOGY

EXECUTIVE
MONDAY, 7 PM - 9 PM

NUCLEAR CRITICALITY SAFETY

EDUCATION MEETING
SUNDAY, 1 PM - 2 PM

PROGRAM
SUNDAY, 2 PM - 3 PM

EXECUTIVE
SUNDAY, 3 PM - 4:30 PM

NUCLEAR INSTALLATION SAFETY

PROGRAM
SUNDAY, 4 PM - 6 PM

EXECUTIVE
SUNDAY, 7:30 PM - 9:30 PM

NUCLEAR NONPROLIFERATION (TG)

SPECIAL ADVISORY COMMITTEE
SUNDAY, 1 PM - 2 PM

PROGRAM
SUNDAY, 2 PM - 3 PM

GOVERNANCE
SUNDAY, 3 PM - 4 PM

OPERATIONS & POWER

NUCLEAR CONSTRUCTION WORKING
GROUP
SUNDAY, 12:30 PM - 2:30 PM

PROGRAM
SUNDAY, 2:30 PM - 4 PM

EXECUTIVE
SUNDAY, 4 PM - 6 PM

RADIATION PROTECTION & SHIELDING

PROGRAM
SUNDAY, 12:30 PM - 1:30 PM

SHIELDING STANDARDS
SUNDAY, 12 PM - 12:30 PM

RADIATION PROTECTION & SHIELDING

EXECUTIVE
SUNDAY, 1:30 PM - 3:30 PM

REACTOR PHYSICS

HONORS & AWARDS
SUNDAY, 10 AM - 11 AM

GOALS & PLANNING
SUNDAY, 1 PM - 2 PM

PROGRAM
SUNDAY, 2 PM - 4 PM

EXECUTIVE
SUNDAY, 4 PM - 6 PM

ROBOTICS & REMOTE SYSTEMS

EXECUTIVE
SUNDAY, 12 PM - 4 PM

THERMAL HYDRAULICS

PROGRAM
SUNDAY, 2:30 PM - 4:30 PM

EXECUTIVE
SUNDAY, 4:30 PM - 6 PM

YOUNG MEMBER GROUP (TG)

EXECUTIVE COMMITTEE
MONDAY, 11:30 AM - 1 PM

STANDARDS COMMITTEES

ANS 3.14
MONDAY, 1 PM - 4 PM

ANS 6.1.1
TUESDAY, 12 PM - 1 PM

ANS 8.1
SUNDAY, 9 AM - 12 PM
TUESDAY, 7 AM - 8:30 AM

ANS-8.26 WORKING GROUP
WEDNESDAY, 7 AM - 8:30 AM

ANS 10.8
SATURDAY, 3 PM - 5 PM

ANS 19
MONDAY, 8:30 AM - 10:30 AM

ANS 19.1
MONDAY, 10:30 AM - 11:30 AM

ANS 19.5
MONDAY, 1 PM - 5 PM

ANS 57.11
TUESDAY, 8 AM - 5 PM
WEDNESDAY, 8 AM - 5 PM

ANS STANDARDS BOD
TUESDAY, 9 AM - 5 PM

LLWRDOCC
WEDNESDAY, 1 PM - 4 PM

NI6
MONDAY, 1 PM - 4:30 PM

NFSC
MONDAY, 8:30 AM - 6:30 PM

RARCC
MONDAY, 4 PM - 6 PM

RP3C
MONDAY, 10 AM - 12 PM

SESC
WEDNESDAY, 8:30 AM - 12 PM

SRACC
WEDNESDAY, 7 AM - 8 AM



ANS Technology Expo

Exhibiting at the ANS Nuclear Technology Expo provides an opportunity to display your technology and services to industry leaders. This premier American Nuclear Society expo provides the potential to learn, interact, and make face-to-face connections with the expected 1,500 plus attendees.

| | | | |
|--|--------------------|---|----------|
| Aaron Nuclear Services | 515 | Mirion Technologies | 702 |
| American Crane and Equipment Corporation | 415 | MHI Nuclear Engineering Company | 110 |
| American Nuclear Society | 707, 708, 709, 710 | Nuclear Energy Institute | TBD |
| AREVA | 201, 203 | Nuclear Energy University Program | 604 |
| Argonne National Laboratory | 321, 323 | Nuclear News/Radwaste Solutions | 710 |
| Black & Veatch | 423 | Nuclear Plant Journal | 410 |
| Canberra | 701 | Oak Ridge National Laboratory | 207, 209 |
| Ceradyne Boron Products | 506, 508 | Pratt & Whitney Rocketdyne | 601, 603 |
| Doosan | 607 | Presray Corporation | 406 |
| DRS Consolidated Controls, Inc. | 515 | PricewaterhouseCoopers | 304 |
| EXCEL SERVICES CORPORATION | 609, 611, 613 | REEL – COH | 316 |
| GEI Consultants, Inc. | 301 | Thermo Fisher Scientific | 615 |
| IAEA Careers | 208 | Transpire | 311 |
| Idaho National Laboratory | 606, 608 | UK Trade & Investment | 108 |
| Innovative Systems Software | 318 | U.S. Nuclear Regulatory Commission | 502 |
| iRobot Corporation | 308 | University of Maryland A James Clark School of Engineering | 616 |
| ITD USA | 505, 507 | University of Missouri Research Reactor (MURR) | 408 |
| Korea Atomic Energy Research Institute | 405, 407 | University of Tennessee Department of Nuclear Engineering | 211 |
| Lockheed Martin | 107 | Westinghouse Electric Company | 516, 518 |
| Mega-Tech Services, LLC | 416 | | |



ANS

FLOOR PLAN

OMNI Shoreham Hotel • Exhibit Hall • Washington, DC
November 10-12, 2013

Exhibit Hall

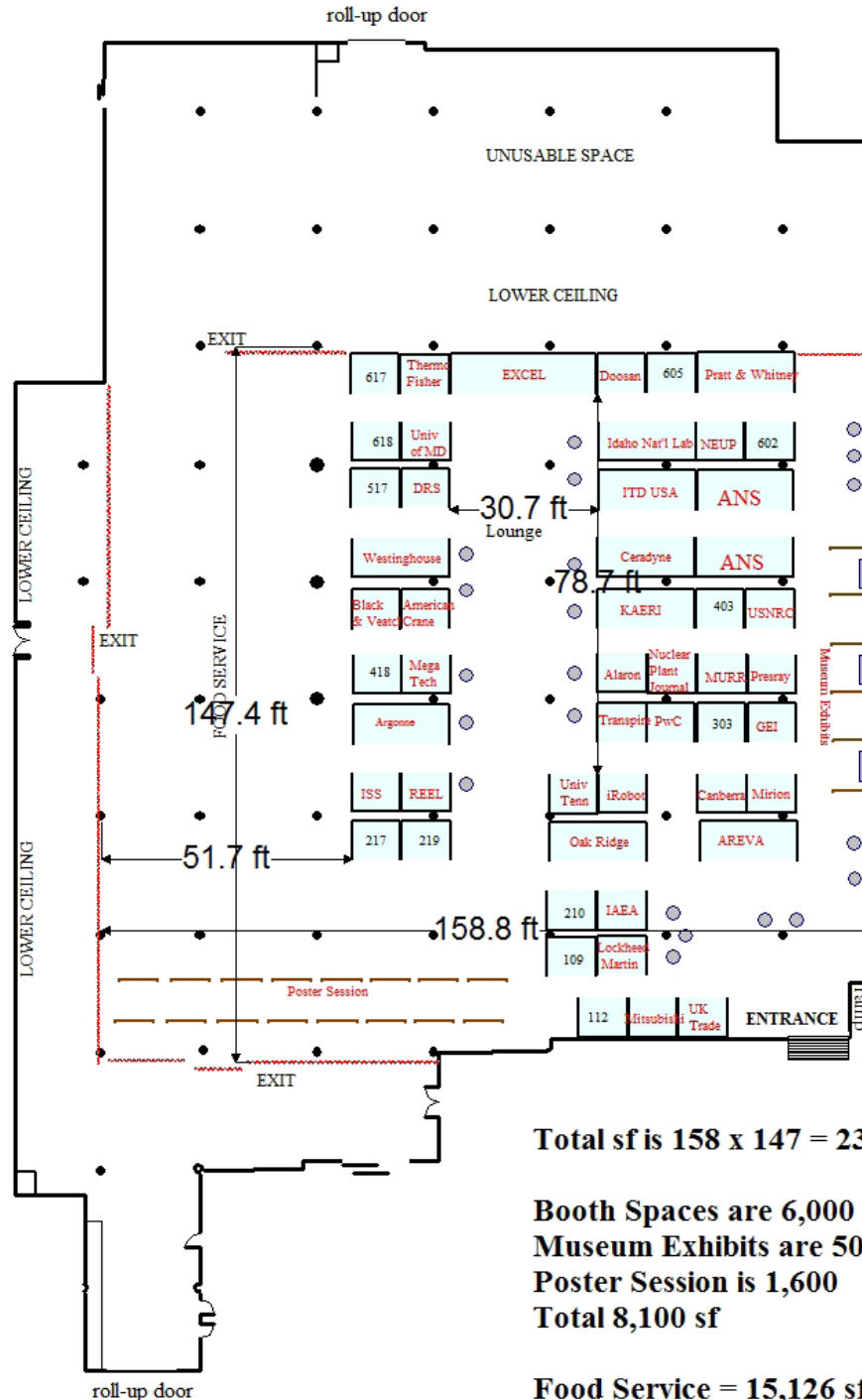


Exhibit space is still available! For more information, contact Barbara Sonneman at sonneman@earlbeckwith.com, 1-800-250-3678 x224.
Visit the website at www.earlbeckwith.com



**American
Nuclear
Society**

ADVANCE CONFERENCE REGISTRATION FORM

ANS 2013 WINTER MEETING & TECHNOLOGY EXPO

The 75th Anniversary of the Discovery of Nuclear Fission

- Embedded Topicals:
- Risk Management for Complex Socio-Technical Systems
 - 2nd ANS SMR 2013 Conference
 - Nuclear Nonproliferation – First Fission to the Future
 - Young Professionals Congress 2013

November 10-14, 2013 • Washington, D.C. • Omni Shoreham Hotel

Fill Out Completely - Please Print

ANS ID #: _____

First Name/Middle Initial: _____ Last Name: _____

Name To Appear On Badge: _____ Company/Affiliation: _____

Job Title: _____ ☐ Company or ☐ Home

Street Address: _____

City/State/Zip: _____ Country: _____

Telephone: _____ Fax: _____

E-mail: _____ E-mail (cc) _____

Special arrangements required to fully participate. Please contact me ☐

Dietary restrictions (meeting attendee only): a) ☐ vegetarian b) ☐ gluten free c) ☐ vegan d) ☐ other

Dietary restrictions (guest only): a) ☐ vegetarian b) ☐ gluten free c) ☐ vegan d) ☐ other

ANS members, please check if this is your: ☐ new address (will change member record) ☐ meeting registration address only

Please note: The information that you provide will be printed on the meeting registration list.

Please indicate: ☐ ANS National Individual Member ☐ ANS Fellow ☐ Emeritus Member ☐ Student ☐ Exhibitor

☐ Non-member ☐ Organization Member Representative ☐ Division Officer ☐ Media

Individual Conference Registration – ANS 2013 Winter Meeting

| | Fees Paid by October 18, 2013 | | | Fees Paid After October 18, 2013 | | |
|--|--------------------------------|--------------------------------|--------------------------------|----------------------------------|----------------------------------|----------------------------------|
| | ANS NATIONAL | | | ANS NATIONAL | | |
| | MEMBER | JOIN ANS* | NON-MEMBER | MEMBER | JOIN ANS* | NON-MEMBER |
| Full ANS Meeting Includes (1) ticket to the ANS President's Reception and (1) ticket to the Attendee Luncheon in the EXPO. | <input type="checkbox"/> \$770 | <input type="checkbox"/> \$940 | <input type="checkbox"/> \$980 | <input type="checkbox"/> \$870 | <input type="checkbox"/> \$1,040 | <input type="checkbox"/> \$1,080 |
| One Day Attendance Does not include the President's Reception or other events. Circle one: Mon Tues Wed Thurs | <input type="checkbox"/> \$545 | — | <input type="checkbox"/> \$695 | <input type="checkbox"/> \$620 | — | <input type="checkbox"/> \$770 |
| ANS Young Member Applies to members 35 years of age or younger and/or members who graduated from a university in 2008 or later. This rate does not apply to students. Includes (1) ticket each to the ANS President's Reception and Attendee Luncheon in the EXPO. | <input type="checkbox"/> \$570 | — | — | <input type="checkbox"/> \$670 | — | — |
| Student Includes (1) ticket to the President's Reception and (1) ticket to the Attendee Luncheon in the EXPO. | <input type="checkbox"/> \$150 | <input type="checkbox"/> \$180 | <input type="checkbox"/> \$200 | <input type="checkbox"/> \$200 | <input type="checkbox"/> \$230 | <input type="checkbox"/> \$250 |
| ANS Emeritus Member Includes (1) ticket to the President's Reception and (1) ticket to the Attendee Luncheon in the EXPO. | <input type="checkbox"/> \$150 | — | — | <input type="checkbox"/> \$200 | — | — |
| Spouse/Guest Includes (1) ticket to the ANS President's Reception and admittance to the Spouse/Guest Hospitality Breakfast on Monday, Tuesday and Wednesday - does not include the technical sessions or other events. | <input type="checkbox"/> \$150 | — | — | <input type="checkbox"/> \$215 | — | — |
| Guest Name (For Badge): _____ | | | | | | |

Exhibitor Registration

Includes (1) full complimentary registration plus (1) exhibit only registration per booth space. (2) additional paid exhibit only allowed per booth. Each exhibitor registration includes (1) ticket to the President's Reception and (1) ticket to the Monday EXPO Luncheon. Exhibit Only registrants do not receive publications or access to technical sessions.

- ☐ Exhibitor comp/full meeting (included)
- ☐ Exhibitor comp/booth only (included)
- ☐ Additional exhibitor/booth only \$195

***New members will be contacted directly for any additional information needed to complete their enrollment.**

Saturday, November 9, 2013

Please Note: Registration for the 2013 ANS Winter Meeting is not required for participation in this program.

Complimentary with National Winter Meeting registration ☐

Event Tickets: **Young Professionals Congress - Saturday Program** ☐ \$35.00 = \$ _____ member

☐ \$75.00 = \$ _____ non-member

Special Events and Tours

Please note: You must be registered for the meeting to purchase a special event ticket.

Sunday, November 10, 2013

Additional Tickets: **ANS President's Reception** # of tickets _____ @ \$85.00 each = \$ _____

Monday, November 11, 2013

Additional Tickets: **Attendee Luncheon in EXPO** # of tickets _____ @ \$45.00 each = \$ _____

Evening Event: Dinner – **Celebrating 75 years of Nuclear Fission** # of tickets _____ @ \$75.00 each = \$ _____

Wednesday, November 13, 2013

Evening Event: **Dinner and Tour at Mount Vernon Estate** # of tickets _____ @ \$95.00 each = \$ _____

Thursday, November 14, 2013

Please note: Form required for participation.

Technical Tour: **An Afternoon on the NS Savannah** # of tickets _____ @ \$35.00 each = \$ _____

Thursday, November 14, 2013

Capitol Hill Visit: **Storm the Hill Day** I will participate ☐ Yes ☐ No Home Zip Code (REQUIRED): _____

Meeting Publications (included with registration):

☐ ANS Transactions (Vol. 109) contains summaries from the 2013 Winter Meeting and includes all embedded topical proceedings: Risk Management for Complex Socio-Technical Systems; 2nd ANS SMR 2013 Conference; and Nuclear Nonproliferation – First Fission to the Future.

Please Select One: CD-Rom only ☐ On-line Access only ☐

Additional Publications Available for Purchase (available at special reduced prices at the ANS registration desk only):

☐ ANS Transactions (Vol. 109) on CD-ROM for \$85

☐ Printed copy of the ANS Transactions (Vol. 109) for \$55

Grand Total and Form of Payment

Total of all Functions and Events Grand Total: \$ _____

Method of Payment ☐ Check ☐ American Express ☐ VISA ☐ MasterCard ☐ Diners Club ☐ Wire Transfer

Credit Card Number: _____ Expiration Date: _____ Security Code: _____

Cardholder's Signature: _____

Print Cardholder's Name if different than Registrant: _____

Please Register On-Site After Tuesday, November 5, 2013.

Make checks payable to ANS in U.S. funds and mail to ANS Registrar, 97781 Eagle Way, Chicago, IL 60678-9770. Credit card registrations may be faxed to 708-579-8221. Do not mail registrations which have been faxed. Send bank funds transfers to Chase Bank, 10. S Dearborn St., Chicago, IL 60603. Bank Phone: 312-661-5000. Bank Fax: 312-661-6417. ANS Checking Account # 824941, Bank Routing Number (ABA) 0210 0002 1 SWIFTCODE (IBAN) CHASUS33. ACH Transfers 0710 0001 3

PLEASE NOTE: When sending something to ANS with express mail or with an overnight service provider such as FedEx, UPS, DHL, etc., please use the following address only: American Nuclear Society, 555 North Kensington Avenue, LaGrange Park, IL 60526, U.S.A. Do not use the Eagle Way address in Chicago for express and overnight mail as it will be returned to sender and this will result in a processing delay.

Registration cancellations must be made in writing prior to October 18 in order to receive a refund minus a \$150 processing fee. Meeting registrations and additional tickets canceled after October 18 will not be refunded; however, you may send a substitute. Please contact the ANS Registrar at telephone number: 708/579-8316 or email: registrar@ans.org with any questions.

2013 ANS WINTER MEETING
TECHNICAL TOUR FORM
FOR THE NATIONAL HISTORIC LANDMARK VESSEL N.S. SAVANNAH
User Controlled

SAVANNAH Technical Staff
Public Access
STS-002-007

Attachment 2
NSS Liability Waiver Form



Attachment 2. NSS Liability Waiver Form

N.S. SAVANNAH
LIABILITY WAIVER

The Maritime Administration welcomes you aboard the N.S. SAVANNAH. A safety briefing will be provided prior to your event. Please come to the ship prepared for this special environment; durable clothing and closed-toe shoes are required. The waiver below must be signed prior to vessel boarding. We appreciate your interest in N.S. SAVANNAH, the Maritime Administration and United States Merchant Marine.

"I am pleased to board N.S. SAVANNAH, moored at Pier 13, Canton Marine Terminal, and partake in this scheduled event. I agree to release and forever discharge the Maritime Administration, its employees, assignees, and agents from any and all liability, charges, claims, or causes of action, arising out of or in any way connected with my boarding and participation in the activity, or any related transportation or other visits. I acknowledge that the Maritime Administration reserves the right to video, photograph, or record any activity associated with this event. I further agree to indemnify and hold forever harmless the Maritime Administration, its employees, assignees, and agents from liability, damage claims, or causes of action made or brought by me or by anyone on behalf of me as a result of or in any way connected with my boarding, participation, or presence in this event. I am the parent or guardian responsible for the child(ren) listed below."

If visitor is under 18, a parent or guardian responsible shall sign below to indicate that the minor child or children named below are under their care and direct supervision.

Minor's Name(s):

Signature:

Date:

Print Name:

Mail or fax this completed form with your advance meeting registration form, no later than October 18, 2013, to:

American Nuclear Society
ANS Registrar
97781 Eagle Way
Chicago, IL 60678-9770
Fax: 708-579-8221
e-mail: registrar@ans.org



ANS

ANS Meeting Mentoring Program

5:00 p.m. – 6:00 p.m. Sunday, November 11, 2013

Embassy Room

The Mentoring Program is a unique opportunity for mentors and mentees to interact and build professional relationships within the nuclear industry.

Register online at <https://ssl.ans.org/meetings/mentoring/> or by completing this form.

Yes, I want to be a mentor ☐ at the meeting ☐ in addition to the meeting

Yes, I want to be mentored ☐ at the meeting ☐ in addition to the meeting

Name

Company or School

Address

Phone

Email

Rank your interests (1, 2, 3, etc.):

☐ Accelerator Applications
☐ Aerospace Nuclear Science & Technology
☐ Biology & Medicine
☐ Decommissioning & Environmental Science
☐ Education, Training & Workforce Development
☐ Fuel Cycle & Waste Management
☐ Fusion Energy
☐ Human Factors, Instrumentation & Controls
☐ Isotopes & Radiation

☐ Materials Science & Technology
☐ Mathematics & Computation
☐ Nuclear Installation Safety
☐ Nuclear Nonproliferation
☐ Operations & Power
☐ Radiation Protection & Shielding
☐ Reactor Physics
☐ Robotics & Remote Systems
☐ Thermal Hydraulics

Submit form to:

Membership Department
American Nuclear Society
555 N. Kensington Avenue
La Grange Park, IL 60526

Fax: 708-579-8295

Email: mvtas@ans.org

Phone: 800-323-3044



ANS Conference

2013 Winter Meeting & Technology Expo

ANS Organization Members

AECL

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NEBRASKA PUBLIC POWER DISTRICT
NEI
NEWPORT NEWS SHIPBUILDING
NEXUS TECHNICAL SERVICES CORPORATION
NGNP INDUSTRY ALLIANCE

NUCLEAR FUEL SERVICES, INC.
NUCLEAR PLANT JOURNAL

ONTARIO POWER GENERATION

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UR-ENERGY USA INC.

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WASTE CONTROL SPECIALISTS

WESTINGHOUSE ELECTRIC CORP.
WOLF CREEK NUCLEAR OPERATING CORP.
WYLE LABORATORIES

About the American Nuclear Society

The American Nuclear Society (ANS) is an international, not-for-profit, scientific and educational organization consisting of about 11,600 individual members, 1,500 organizations, 90 Organization Members, 20 professional divisions/technical groups 51 U.S. and 9 non-U.S. local sections/affiliated societies, 14 plant branches, and 45 student sections. ANS also maintains about 30 formal agreements for cooperation with international organizations.

The Society's main objectives are the advancement of engineering and science relating to the atomic nucleus, and to the integration of the science and management disciplines constituting nuclear science and technology. Other purposes are to encourage research, establish scholarships, disseminate information, inform the general public about nuclear-related activities, conduct meetings at which scientific and technical papers are presented, and cooperate with government agencies, educational institutions, and other organizations having similar purposes.

