ANS Winter Meeting & Expo

2017
Official Program

October 29-November 2, 2017
Washington, D.C.
Marriott Wardman Park

ANS Winter Meeting & Expo

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2017 Winter Meeting

GENERAL CHAIR:
Ty Troutman
Bechtel

ASSISTANT GENERAL CHAIR:
Desmond W. Chan
Bechtel

TECHNICAL PROGRAM CHAIR:
Kenneth J. Geelhood
PNNL

ASSISTANT TECHNICAL PROGRAM CHAIR:
Elia Merzari
Argonne National Laboratory

STUDENT PROGRAM COCHAIR:
Maria Molina Higgins
Virginia Commonwealth University

STUDENT PROGRAM COCHAIR:
Travis Dietz
University of Maryland

MEDIA COCHAIR:
Mimi Limbach
Potomac Communications Group

MEDIA COCHAIR:
Brian C. Meeley
Potomac Communications Group

TECHNICAL TOUR COCHAIR:
Amber Johnson
University of Maryland

TECHNICAL TOUR COCHAIR:
Eric Duvekot
Porvair Filtration Group Inc.

FINANCE COCHAIR:
Colleen Deegan
Bechtel

FINANCE COCHAIR:
Jim Behrens
U.S. Navy-Ret.

FINANCE COCHAIR:
Tom Snow
Dominion Energy

Daily Schedule

Saturday, October 28

7:30-8:45 am	YPC Continental Breakfast	Lincoln 5
8:45 am-6:00 pm	Young Professionals Congress Sessions	Lincoln 2-4
2:00-5:00 pm	Registration	Convention Registration Foyer (Lobby Level)

Sunday, October 29

7:00 am-7:00 pm	Registration	Convention Registration Foyer (Lobby Level)
6:00-8:00 pm	ANS President's Opening Reception in Technology Expo	Exhibit Hall A
6:00-8:00 pm	ANS Nuclear Technology Expo	Exhibit Hall A

Monday, October 30

7:00 am-5:00 pm	Registration	Convention Registration Foyer (Lobby Level)
7:00 am-5:00 pm	ANS Nuclear Technology Expo	Exhibit Hall A
7:30-8:00 am	Morning Coffee Service	Exhibit Hall A
8:00-11:40 am	Opening Plenary: Generations in Collaboration: Building for Tomorrow	Marriott 1, 2, 3
11:40 am-1:00 pm	Luncheon in Technology Expo	Exhibit Hall A
1:00-4:15 pm	ANS Technical Sessions	
	• Commercializing New Reactor Technologies—Fuel Cycle Implications and Challenges	Delaware A
	• Molten Salt Processing-Online Processing Redox	Delaware A
	• Past, Present and Future Validation Methods in International Criticality Safety Assessment	Delaware B
	• Accident Tolerant Fuels	Virginia A
	• Production and Applications of Isotopes and Radiation	Virginia B
	• Perspectives on Diversity in the Nuclear Industry–Panel	Virginia C
	• Current Issues in Computational Methods–Roundtable	Maryland A
	• Best of NPIC-HMIT 2017—I: Advances in Instrumentation and Control–Panel	Maryland C
	• Advanced Reactor Source Term, Radiological, and Accident Evaluations–Panel	Maryland B
	• Nuclear Hybrid Energy Systems–Panel	Washington 1
	• Thermal-Hydraulic Collaborations in Industry, Academia and Labs–Panel	Washington 2
	• General Thermal Hydraulics—I	Washington 3
	• Dwight D. Eisenhower Award Special Session—I: Honoring the 2017 Award Recipients–Panel	Washington 4
	• Dwight D. Eisenhower Award Special Session—II: Nuclear Nonproliferation Policy–Panel	Washington 4
	• Student Design Competition	Hoover
	• Nexus Between Ethics and Nuclear Safety Culture–Panel	Coolidge
	• Reactor Physics: General—I	Harding
2:45-3:00 pm	Coffee Break	Exhibit Hall A
4:30-6:40 pm	ANS President's Special Session	Marriott 3

Daily Schedule

Tuesday, October 31

7:00 am-5:00 pm	Registration	Convention Registration Foyer (Lobby Level)
7:00 am-5:00 pm	ANS Nuclear Technology Expo	Exhibit Hall A
7:30-8:00 am	Morning Coffee Service	Exhibit Hall A
8:00-11:40 am	ANS Technical Sessions	
	• Used Fuel Management Status–Panel	Delaware A
	• Radiation Therapy, Standards, and Effects	Delaware B
	• Advanced Measurement Techniques	Virginia A
	• Critical and Subcritical Experiments	Virginia B
	• Is a Start-up Right for You?–Panel	Virginia C
	• Existing Nuclear as a Bridge to Advanced Nuclear–Panel	Virginia C
	• Monte Carlo Methods	Maryland A
	• Best of NPIC-HMIT 2017—II: Advances in Human Factors and Human-Machine Interface–Panel	Maryland C
	• Radiation Protection and Shielding: General	Maryland B
	• Thermal Energy Storage Systems and Their Integration with NPPs	Washington 1
	• Two-Phase Flow Fundamentals	Washington 2
	• General Thermal Hydraulics—II	Washington 3
	• Decommissioning Rulemaking Committee–Panel	Washington 4
	• Research by U.S. DOE NEUP-Sponsored Students—I	Hoover
	• Technical Approach for Defense in Depth for Advanced Reactors–Panel	Coolidge
	• U.S. and UK International Collaboration on Nuclear R&D—I–Panel	Harding
	• U.S. and UK International Collaboration on Nuclear R&D—II	Harding
9:20-9:35 am	Coffee Break	Exhibit Hall A
11:00 am-1:00 pm	Student Poster Session in Technology Expo	Exhibit Hall A
11:40 am-1:00 pm	Luncheon in Technology Expo	Exhibit Hall A
1:00-4:15 pm	ANS Technical Sessions	
	• The Need for Hot Cells for Nuclear R&D–Panel	Delaware A
	• Recent Nuclear Criticality Safety Program Technical Accomplishments	Delaware B
	• Nuclear Fuels and Materials in Fast Reactors	Virginia A
	• Export Controls–Panel	Virginia B
	• Fuel Cycle Analysis	Virginia B
	• Perspectives on the ANS Congressional Fellowship–Panel	Virginia C
	• Potent Policies: Understanding ANS Position Papers–Panel	Virginia C
	• Deterministic Transport Methods	Maryland A
	• Human Factors, Instrumentation, and Controls: General—I	Maryland C
	• Reactor Physics Challenges in Molten Salt Reactor Design—I	Maryland B
	• The GAIN Initiative for Advanced Nuclear Power Plants–Panel	Washington 1
	• Thermal Hydraulics for Nuclear Space Applications–Panel	Washington 2
	• Thermal Hydraulics of Advanced Reactors	Washington 3
	• International Decommissioning—I: Fukushima	Washington 4
	• Focus on Communications—I: Communicating with Policy Makers–Panel	Hoover
	• Focus on Communications—II: Meet the Media–Panel	Hoover
	• NRC Spent Fuel Pool Level 3 PRA Insights–Panel	Coolidge
	• Reactor Analysis Methods—I	Harding
2:45-3:00 pm	Coffee Break	Exhibit Hall A
4:30-6:40 pm	General Chair's Special Session: Career Opportunities for Next Generations of Nuclear Engineers and Scientists in Advanced Reactor Markets	Marriott 3

Daily Schedule

Wednesday, November 1

7:00 am-5:00 pm	Registration	Convention Registration Foyer (Lobby Level)
7:30-8:00 am	Morning Coffee Service	Marriott Ballroom Foyer
8:00-11:40 am	ANS Technical Sessions	
	• Technical Grand Challenges for Fuel Cycle and Waste Management–Panel	Delaware A
	• Data, Analysis and Operations in Nuclear Criticality Safety—I	Delaware B
	• Post-Irradiation Examination	Virginia A
	• Best of Paper Session from ANTPC	Virginia B
	• The Importance of ANS Standards–Panel	Virginia C
	• Nuclear's Role in Climate Change–Panel	Virginia C
	• Computational Methods	Maryland A
	• Human Factors, Instrumentation, and Controls: General—II	Maryland C
	• Computational Tools for Radiation Protection and Shielding	Maryland B
	• Advanced/Gen-IV Reactors—I	Washington 1
	• Advanced/Gen-IV Reactors—II	Washington 1
	• Computational Thermal Hydraulics—I: Computational Fluid Dynamics	Washington 2
	• Experimental Thermal Hydraulics—I: Focus on Advanced Instrumentation	Washington 3
	• International Decommissioning—II: Chernobyl	Washington 4
	• Research by U.S. DOE NEUP-Sponsored Students—II	Hoover
	• Technical Issues with Proposed Revision to NRC Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants"–Panel	Coolidge
	• Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—I	Harding
	• Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—II–Panel	Harding
9:20-9:35 am	Coffee Break	Marriott Ballroom Foyer
11:40 am-1:00 pm	Lunch on Own	
1:00-4:15 pm	ANS Technical Sessions	
	• Progress in DOE's Nuclear Technology Research and Development Program–Panel	Delaware A
	• Current Spent Fuel Pool Nuclear Criticality Safety Issues for NRC Licensees–Panel	Delaware B
	• Membership Challenge Activity Debrief and Solution Discussion–Panel	Delaware B
	• Nuclear Fuels	Virginia A
	• Progress in Reducing the Threat of HEU Around the World–Panel	Virginia B
	• Advocacy and Communication: A Clean Energy Discussion–Panel	Virginia C
	• Nuclear Policy 101–Panel	Virginia C
	• Mathematical Modeling, Analytic Solutions, and Benchmarks	Maryland A
	• Human Factors, Instrumentation, and Controls: General–III	Maryland C
	• Dose Rates Assessment due to Spent Fuel and Activated Materials	Maryland B
	• New Nuclear Construction Around the World–Status Report–Panel	Washington 1
	• Young Professional Thermal-Hydraulic Research Competition	Washington 2
	• Reactor Physics: General—II	Washington 3
	• International Decommissioning—III: Fukushima, Chernobyl and TMI 2–Panel	Washington 4
	• Research Opportunities in Advanced Fission and Fusion Materials–Panel	Hoover
	• Nuclear Installations Safety: General—I	Coolidge
	• Reactor Physics Challenges in Molten Salt Reactor Design—II	Harding
	• Reactor Physics Challenges in Molten Salt Reactor Design—III–Panel	Harding
2:45-3:00 pm	Coffee Break	Marriott Ballroom Foyer
4:30-6:40 pm	ANS Technical Sessions	
	• Data, Analysis and Operations in Nuclear Criticality Safety—II	Delaware B
	• Research by U.S. DOE NEUP-Sponsored Students—III	Virginia A
	• Nuclear Nonproliferation Policy: General	Virginia B
	• Uncertainty Quantification and Sensitivity Analysis—I	Maryland A
	• Reactor Analysis Methods—II	Maryland B
	• The DNP Initiative for U.S. Nuclear Power Plants–Panel	Washington 1
	• Severe Accident Modeling and Experiments for Advanced Reactor Safety	Washington 2
	• Experimental Thermal Hydraulics—II	Washington 3
	• Education, Training and Workforce Development: General	Hoover
	• Current Topics in Probabilistic Risk Analysis	Coolidge
	• Reactor Physics Challenges in LWR Fleet–Panel	Harding
4:30-6:40 pm	Fukushima Session	Washington 4

Daily Schedule

Thursday, November 2

7:00 am-3:00 pm	Registration	Convention Registration Foyer (Lobby Level)
7:30-8:00 am	Morning Coffee Service	Marriott Ballroom Foyer
8:00-11:30 am	Technical Tour: NIST Center for Neutron Research	
8:00-11:40 am	ANS Technical Sessions	
	• Nuclear Waste Management and Remediation	Delaware A
	• ANS-8 Standards Process, Current Revisions, and Connections to Wider Standards Organizations–Panel	Delaware B
	• ANS-8 Standards Forum	Delaware B
	• Materials Aging in Nuclear Plant Operations (metals, concrete, cables, condition monitoring, etc.)	Virginia A
	• SCALE/ORIGEN for Nuclear Nonproliferation and Safeguards Applications–Tutorial	Virginia B
	• Advancements in Radiation Measurement and Imaging Technology	Virginia C
	• Uncertainty Quantification and Sensitivity Analysis—II	Wilson B
	• Used Nuclear Fuel Challenges	Wilson C
	• Reactor Physics: General—III	Maryland B
	• Operations and Power: General	Washington 1
	• Computational Thermal Hydraulics—II	Washington 2
	• Advanced Technologies and Analysis for Nuclear Reactors, Fusion Systems and Accelerator Applications—I	Washington 3
	• U.S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—I–Tutorial	Washington 4
	• Innovations in Nuclear Technology R&D Awards	Hoover
	• Nuclear Installations Safety: General—II	Coolidge
	• Reactor Physics Design, Validation and Operational Experience—I	Harding
9:00 am-12:30 pm	Technical Tour: Maryland University Training Reactor	
9:20-9:35 am	Coffee Break	Marriott Ballroom Foyer
9:30 am-5:00 pm	Young Professionals Congress – Capitol Hill Visit: Storm the Hill	
11:40 am-1:00 pm	Lunch on Own	
1:00-4:15 pm	ANS Technical Sessions	
	• Fuel Cycle and Waste Management: General	Delaware A
	• Materials Aging in Nuclear Fuel Storage (aging fuels management, cask degradation, etc.) and Advanced Manufacturing	Virginia A
	• Specialty Fuel for Space/Defense Reactors: Discussion on Performance Specifications and Nonproliferation Policy–Panel	Virginia B
	• Reactor Physics Design, Validation and Operational Experience—II	Maryland B
	• Severe Accident Modeling and Experiments for Light Water Reactors	Washington 2
	• Advanced Technologies and Analyses for Nuclear Reactors, Fusion Systems and Accelerator Applications—II	Washington 3
	• U. S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—II–Tutorial	Washington 4
	• Highlights from PSA 2017–Panel	Coolidge
	• Reactor Analysis Methods—III	Harding
	• Challenges and Opportunities with Accelerated Qualification of LWR ATF Cladding and Fuel Materials–Panel	Delaware B
	• SCALE/ORIGEN for Shielding Source Term Generation–Tutorial	Virginia C
2:45-3:00 pm	Coffee Break	Marriott Ballroom Foyer

General Information

MEETING INFORMATION

The 2017 ANS Winter Meeting promises to be one of the year's most exciting and informative educational and networking events for attendees from every facet of nuclear science and technology. The theme for this meeting is "Generations in Collaboration: Building for Tomorrow".

In addition, the Technology Expo will give attendees a glimpse into the applications of new technology through three days of exhibits and special events. The Expo will also give attendees many opportunities to network with each other and establish new professional relationships while having food and fun in a friendly and informal setting.

The 2017 ANS Winter Meeting and Technology Expo is the premier North American nuclear science and technology conference. If you're interested in expanding your knowledge, sharing ideas, and networking in one of the world's most exciting entertainment destinations, don't miss this opportunity. Please join us at the 2017 ANS Winter Meeting.

REGISTRATION

Location: **Convention Registration Foyer (Lobby Level)**

Name badges must be worn during all technical sessions, in the Expo, and at events. Certain events require a ticket and may entail an additional cost.

REGISTRATION HOURS

Saturday, October 28	2:00 - 5:00 pm
Sunday, October 29	7:00 am - 7:00 pm
Monday, October 30	7:00 am - 5:00 pm
Tuesday, October 31	7:00 am - 5:00 pm
Wednesday, November 1	7:00 am - 5:00 pm
Thursday, November 2	7:00 am - 3:00 pm

TECHNOLOGY EXPO HOURS

Location: **Exhibit Hall A**

Join us and visit with our exhibitors in the Expo! Learn about new technology, products, and services that are being offered. Morning coffee service, breaks, and reception will be hosted in the Expo. For more information or to view the floorplan and exhibitors see pages 72-75.

Sunday, October 29	6:00 - 8:00 pm
Monday, October 30	7:00 am - 5:00 pm
Tuesday, October 31	7:00 am - 5:00 pm

#ANSMeeting

General Information

NOTICE TO SPEAKERS

After printing your badge, all speakers and session chairs must check in at the Speaker Desk located near the ANS Registration Desk.

ATTENDEE MEAL FUNCTIONS

YPC Continental Breakfast & Lunch
Saturday, October 28

ANS President's Opening Reception
This reception is a ticketed event on Sunday evening from 6:00 - 8:00 pm. Reception and (2) drink tickets are included with a full meeting registration. Additional reception tickets are available for purchase at the following cost: $125 (Adult) / $50 (Child, 16 and under)

Morning Coffee Service
Morning coffee and tea will be provided to all registered meeting attendees Monday-Thursday.

Lunch & Breaks in the Technology Expo
Lunch will be provided to all registered meeting attendees Monday and Tuesday. Daily coffee breaks will also be provided Monday-Thursday.

ANS BUSINESS OFFICE

Park 8216
Sunday-Wednesday: 8:00 am-5:00 pm
Thursday: 8:00 am-4:15 pm

ANS MEDIA CENTER

Park 8226
Monday-Tuesday: 7:45 am-5:00 pm
Wednesday: 7:45 am-4:00 pm

ANS CONFERENCE OFFICE

Park 8212
Sunday-Wednesday: 8:00 am-5:00 pm
Thursday: 8:00 am-1:00 pm

ANS STUDENT OFFICE

Park 8224
Sunday-Wednesday: 8:00 am-5:00 pm
Thursday: 8:00 am-4:15 pm

EMBEDDED TOPICAL MEETING

The 2017 Young Professionals Congress will be held on Saturday, October 28, at 8:00 am. For additional information in regards to the 2017 Young Professionals Congress, visit pages 63-66.

ANS MEETINGS APP

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Scan this code or type in Attendee Hub to your app store, download the app, then type in ANS Winter Meeting and login to the ANS Meetings App to experience all of the app features!
NOTE: All session evaluations will be done in the app only.

If you still have the email invitation sent to you by ANS Meetings:

1. Open the invitation in your inbox. Tap Verify Account.
2. Tap Open App. to complete the verification via your brand new mobile app.

If you need to retrieve your Verification Code:

1. From the event homescreen, tap the hamburger icon (three white lines) at the top left of the screen.
2. Tap Log in for more features!
3. Enter your first and last name and tap Next.
4. Tap Resend Code to have your verification code sent to your preferred email address.

Or go to event.crowdcompass.com/answintermeeting for the online event guide.

General Information

OTHER THINGS TO ATTEND

Teachers Workshop
Saturday: 7:30 am-5:00 pm **Location:** Lincoln 6

Learn how ANS members conduct teacher workshops by observing one in progress. You will learn methods and hands-on activities you can incorporate into your own Local Section programs. Advance Registration is required. Please contact Janice Lindegard, ANS Education and Community Outreach Specialist, at 708-579-8290 for further details. This workshop is supported by the ANS Center for Nuclear Science and Technology Information.

First-Time Attendee Orientation
Sunday: 1:00-1:30 pm **Location:** Washington 4

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.

Social Media Team
Sunday: 2:00-3:00 pm **Location:** Washington 4

Looking to get more involved with the Society? Become part of the ANS Social Media Team. All members are welcome. Join us as we explain ANS social media, roles and responsibilities, as well as writing for the Society's blog, the ANS Nuclear Cafe. You will also have the opportunity to meet some of the Social Media Team's current members.

Student Program Q&A Meeting
Sunday: 4:00-5:00 pm **Location:** Washington 1

Attendance at the 2017 ANS Winter Meeting is an exciting professional opportunity for college and graduate students. For information on the Student Program, see the Student Program Instructions document on the Winter Meeting webpage. Students participating in this program should attend this meeting.

Mentor Meeting
Sunday: 5:00-6:00 pm **Location:** Madison B

All attendees, from seasoned professionals to students, are encouraged to attend this informal one-hour open discussion. Prior mentor/mentoring experience is not required. Simply come share your insights, ask questions, and network in this mentoring experience beneficial to all.

Attention Runners: ANS Fun Run
Tuesday: 6:00 am **Location:** Hotel Lobby

There will be a noncompetitive run starting at 6:00 am from the lobby entrance of the hotel. We hope you can join us. Bring shoes and a big smile!

General Information

ABOUT ANS

Mission

ANS provides its members with opportunities for professional development. It also serves the nuclear community by creating a forum for sharing information and advancements in technology, and by engaging the public and policymakers through communication outreach.

Code of Ethics

Recognizing the profound importance of nuclear science and technology in affecting the quality of life throughout the world, members of the American Nuclear Society (ANS) are committed to the highest ethical and professional conduct.

ANS members as professionals are dedicated to improving the understanding of nuclear science and technology, appropriate applications, and potential consequences of their use.

To that end, ANS members uphold and advance the integrity and honor of their professions by using their knowledge and skill for the enhancement of human welfare and the environment; being honest and impartial; serving with fidelity the public, their employers, and their clients; and striving to continuously improve the competence and prestige of their various professions. The Code of Ethics can be found at www.ans.org/about/coe.

Statement on Diversity

The American Nuclear Society (ANS) is committed, in principle and in practice, to creating a diverse and welcoming environment for everyone interested in nuclear science and technology. Diversity means creating an environment – both in ANS and in the profession – in which all members are valued equitably for their skills and abilities and respected equally for their unique perspectives and experiences. Diverse backgrounds foster unique contributions and capabilities, and so creation of an inclusive Society ultimately leads to a more creative, effective, and technically respected Society.

ANS believes that everyone deserves opportunities for learning, networking, leadership, training, recognition, volunteering in Society activities, and all the other benefits that involvement in the Society brings, regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. The selection of a member to serve in ANS's volunteer leadership structure shall be based solely on the member's ability, interest, and commitment to serve. In particular, ANS encourages members at each level of the Society and in each Professional Division and Technical Group to make special efforts to recruit underrepresented minorities and women to ensure that they are adequately represented in the Society.

Respectful Behavior Policy (Abbreviated)

The open exchange of ideas, freedom of thought and expression, and productive scientific debate are central to the mission of the American Nuclear Society (ANS). These require an open and diverse environment that is built on dignity and mutual respect for all participants and ANS staff members, and is free of bias and intimidation.

ANS is dedicated to providing a safe, welcoming, and productive experience for everyone participating in Society events and other Society activities regardless of age, color, creed, disability, ethnicity, gender identity and expression, marital status, military service status, national origin, parental status, physical appearance, race, religion, sex, or sexual orientation. Creation of a safe and welcoming environment is a shared responsibility held by all participants. Therefore, ANS will not tolerate harassment of or by participants (including ANS volunteer leaders and staff members) in any form. Disciplinary action for participants found to have violated this principle may include reprimand, expulsion from an event or activity with or without a refund, temporary or permanent exclusion from all ANS events and activities, suspension or expulsion from volunteer leadership positions or groups, and/or suspension or expulsion from Society membership, as appropriate.

If you or someone else experiences harassment, regardless of how you otherwise choose to initially handle the situation, you are encouraged to report the situation to ANS. It is possible that the behavior you experienced is part of a larger pattern of repeated harassment. Please alert ANS to behavior you feel to be harassment regardless of the offender's identity or standing in the Society.

The designated contact person for reports at the 2017 Winter Meeting is ANS President Robert Coward during or after the event at rcoward@mbr.com.

The complete Respectful Behavior Policy can be found at www.ans.org/about/rbp. If you have questions about the policy, please contact ANS Executive Director Robert C. Fine at 708-579-8200 or *rfine@ans.org*.

SATURDAY, OCTOBER 28

Young Professionals Congress Sessions
Location: Lincoln 2-4 **Time:** 8:45 am-6:00 pm

For details, see pages 63-66.

SUNDAY, OCTOBER 29

ANS President's Opening Reception in Technology Expo
Location: Exhibit Hall A **Time:** 6:00-8:00 pm

All attendees are invited to enjoy an evening of networking. This event is included in your full meeting registration. Additional tickets are available for purchase at the following cost: $125 (Adult) / $50 (Child, 16 and under).

MONDAY, OCTOBER 30

Opening Plenary: Generations in Collaboration: Building for Tomorrow
Chair: Ty Troutman, Jr. *(Bechtel)*
Location: Marriott 1, 2, 3 **Time:** 8:00-11:40 am

There has been significant advancement in the fields of nuclear science and technologies in the last decade relating to advanced nuclear materials, reactors and accelerator driven systems, reliability and risk assessment, and advanced modeling and simulation. We have also seen an increase in technology development activities and financial investment in various advanced reactor designs (both fission and fusion) in the last ten years. The supply of a highly trained nuclear workforce becomes crucial to the success of the research, development, design, construction, and operation of these new nuclear facilities and systems. This panel of senior government and industry executives will discuss the challenges and potential solutions to develop the next generation of nuclear professionals.

Keynote Speaker: Dan Brouillette *(Deputy Secretary of the U.S. Department of Energy)*
Speakers: Kára McCullough *(Physical Scientist, Miss USA 2017)*
Maria Korsnick *(CEO, Nuclear Energy Institute)*
Jean Llewellyn OBE *(Chief Executive, UK National Skills Academy Nuclear)*
Patricia Falcone *(Deputy Director for Science and Technology, Lawrence Livermore National Laboratory.)*

ANS President's Special Session: Understanding Energy Markets: How They Work, Why They're Broken, and What ANS Members Can Do to Ensure They're Fixed
Moderator: John Kotek *(Vice President for Policy Development and Public Affairs, Nuclear Energy Institute)*
Location: Marriott 3 **Time:** 4:30-6:40 pm

How nuclear power plants are impacted by energy marketplaces is a complex web. Nuclear professionals who are not directly involved with these markets often find it challenging to fully understand the intricacies of how market rules – which can vary from state to state – are impacting the outlook for nuclear energy in the U.S. This session will provide a clear explanation of how the energy markets work, how they affect nuclear plants, and actionable guidance for communicating effectively about them with the public and policymakers.

Panelists: Bob Coward *(ANS President, Principal Officer of MPR Associates)*
Gene Grecheck *(Former ANS President and Cochair, ANS Nuclear in the States Campaign)*
Edward McGinnis *(Acting Assistant Secretary for Nuclear Energy, Department of Energy)*
Matt Crozat *(Senior Director, Policy Development, Nuclear Energy Institute)*
Matt Gallagher *(Nuclear Matters)*

Operations & Power Division (OPD) Dinner
Location: Stone's Throw Restaurant and Bar **Time:** 7:00 – 10:00pm

Join the Operations and Power Division at Stone's Throw Restaurant and Bar (located in the Marriott Wardman Park) to celebrate a successful year as a division. This event is not included in your registration fee.

Plenary, Special Sessions & Events

TUESDAY, OCTOBER 31

Student Poster Session in Technology Expo

Location: Exhibit Hall A **Time:** 11:00 am-1:00 pm

Stop by the Exhibit Hall and join us for lunch, posters and networking! Student Technical posters will be on display Tuesday, during the lunch hour in the Technology Expo. During this time, presenters will stand beside their posters to answer questions and informally discuss the topic of their poster. A complete list of posters may be found on page 31.

General Chair's Special Session: Career Opportunities for Next Generations of Nuclear Engineers and Scientists in Advanced Reactor Markets

Chair: Ty Troutman *(Bechtel)*
Location: Marriott 3 **Time:** 4:30-6:40 pm

Over the last decade there have been many start-up companies in Advanced Reactor technologies -both fission and fusion. This panel of industry executives from start-up companies will discuss what it takes to start a technology development effort, access challenges (financing, resources, and organization), and identify opportunities for young generations of nuclear engineers and scientists.

Speakers: Patrick McGrath *(Associate Director of Technology, ARPA-E)*
Leslie Dewan *(CEO, Transatomic Power)*
David Dabney *(CEO, StarCore)*
Eben Mulder *(CTO, X-Energy),*
Mike Laufer *(CEO, Kairos Power)*

Speakers Bureau Workshop

Location: Marriott 1 **Time:** 6:30-8:30 pm

New members are welcome to join this dynamic group of speakers to help students and the public learn the many benefits that nuclear science and technology brings to their lives. The workshop will prepare you to participate in outreach activities in your community and review ANS messaging and outreach plans for the year. This is a great chance for potential new Bureau members to learn more before applying to join the group. Light appetizers and soft drinks will be served.

WEDNESDAY, NOVEMBER 1

Focus on Communications Workshop/Pre-Storm the Hill Briefing

Location: Wilson C **Time:** 4:30-6:30 pm

This session will provide attendees with a general overview of the political and policy landscape in Washington, D.C. and prepare Storm the Hill participants for their visits in Congress. Mimi Limbach of Potomac Communications will present recent research on nuclear issues and discuss effective messaging techniques. Craig Piercy, ANS Washington Representative, will brief participants on the status of and outlook for major nuclear policy issues, and provide materials and talking points for congressional meetings. Beer, wine, soft drinks, and light snacks will be provided, courtesy of NuScale.

Fukushima Session: Enhancement of Risk-Informed Decision-Making Against Natural Events – Perspectives on the Treatment of Uncertainty in the Future

Moderator: Robert J. Budnitz *(LBNL)*
Location: Washington 4 **Time:** 4:30-6:40 pm

In light of the Fukushima Daiichi accident, external natural events have been recognized as one of the most important threats to nuclear power plants. In response to the accident, a series of panel discussions have been held at ANS meetings. The prior sessions mainly discussed "What are the important factors for the enhancement of Risk-Informed Decision-Making (RIDM) from the perspective of R&D and practical implementation?" This session will explore the future prospects for R&D regarding the treatment of uncertainties in the analysis of external natural events, and their practical implementation. Also, what R&D projects and trials are necessary in the future? Our goal is to conclude the series of sessions by showing the future direction of enhanced RIDM.

Panelists: James Jim Johnson *(JJJ & Associates)*
Jon Ake *(NRC)*
Akira Yamaguchi *(Univ Tokyo)*
Muneo Hori *(Univ Tokyo)*

THURSDAY, NOVEMBER 2

NIST Center for Neutron Research Technical Tour

Time: 8:00-11:30 am

Registration for this tour closed on October 23rd. Board the bus at the 24th Street Entrance (next to Harry's Pub).

Maryland University Training Reactor Technical Tour

Time: 9:00 am-12:30 pm

Registration for this tour closed on October 23rd. Board the bus at the 24th Street Entrance (next to Harry's Pub).

Storm Capitol Hill

Time: 9:30 am-5:00 pm

Registration for this event closed on September 21st. Storm Capitol Hill and meet with your congressional representatives to advocate for nuclear science and technology! Please block off Thursday, November 2nd from 9:30 am – 5:00 pm for your visits. Plan to attend the Wednesday afternoon Communications Workshop to receive information on your Capitol Hill meetings and meet fellow participants.

Technical Sessions by Division

SPECIAL SESSIONS

Opening Plenary: Generations in Collaboration: Building for Tomorrow, Mon. am (8:00-11:40 am)

ANS President's Special Session, Mon. pm (4:30-6:40 pm)

General Chair's Special Session, Tues. pm (4:30-6:40 pm)

Fukushima Session, Wed. pm (4:30-6:40 pm)

Parentheses indicate cosponsorship

ACCELERATOR APPLICATIONS (AAD)

(Student Design Competition), Mon. pm

(Advanced Technologies and Analysis for Nuclear Reactors, Fusion Systems and Accelerator Applications—I), Thurs. am

Advanced Technologies and Analyses for Nuclear Reactors, Fusion Systems and Accelerator Applications—II, Thurs. pm

AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY (ANSTD)

(Nuclear Hybrid Energy Systems–Panel), Mon. pm

(Student Design Competition), Mon. pm

BIOLOGY AND MEDICINE (BMD)

(Production and Applications of Isotopes and Radiation), Mon. pm

Radiation Therapy, Standards, and Effects, Tues. am

(Advancements in Radiation Measurement and Imaging Technology), Thurs. am

DECOMMISSIONING AND ENVIRONMENTAL SCIENCES (DESD)

Decommissioning Rulemaking Committee–Panel, Tues. am

International Decommissioning—I: Fukushima–Panel, Tues. pm

International Decommissioning—II: Chernobyl–Panel, Wed. am

International Decommissioning—III: Fukushima, Chernobyl, and TMI 2–Panel, Wed. pm

U.S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—I–Tutorial, Thurs. am

U. S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—II–Tutorial, Thurs. pm

EDUCATION, TRAINING, AND WORKFORCE DEVELOPMENT (ETWDD)

Student Design Competition, Mon. pm

Research by U.S. DOE NEUP-Sponsored Students—I, Tues. am

Research by U.S. DOE NEUP-Sponsored Students—II, Wed. am

Research by U.S. DOE NEUP-Sponsored Students—III, Wed. pm

Focus on Communications—I: Communicating with Policy Makers–Panel, Tues. pm

Focus on Communications—II: Meet the Media–Panel, Tues. pm

Education, Training and Workforce Development: General, Wed. pm

Innovations in Nuclear Technology R&D Awards, Thurs. am

FUEL CYCLE AND WASTE MANAGEMENT (FCWMD)

Commercializing New Reactor Technologies—Fuel Cycle Implications and Challenges, Mon. pm

Molten Salt Processing-Online Processing Redox, Mon. pm

Used Fuel Management Status–Panel, Tues. am

The Need for Hot Cells for Nuclear R&D–Panel, Tues. pm

Fuel Cycle Analysis, Tues. pm

Technical Grand Challenges for Fuel Cycle and Waste Management–Panel, Wed. am

Progress in DOE's Nuclear Technology Research and Development Program–Panel, Wed. pm

Nuclear Waste Management and Remediation, Thurs. am

Used Nuclear Fuel Challenges, Thurs. am

Fuel Cycle and Waste Management: General, Thurs. pm

FUSION ENERGY (FED)

Research Opportunities in Advanced Fission and Fusion Materials–Panel, Wed. pm

Advanced Technologies and Analysis for Nuclear Reactors, Fusion Systems and Accelerator Applications—I, Thurs. am

(Advanced Technologies and Analyses for Nuclear Reactors, Fusion Systems and Accelerator Applications—II), Thurs. pm

HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS (HFICD)

Best of NPIC-HMIT 2017—I: Advances in Instrumentation and Control–Panel, Mon. pm

Best of NPIC-HMIT 2017—II: Advances in Human Factors and Human-Machine Interface–Panel, Tues. am

Human Factors, Instrumentation, and Controls: General—I, Tues. pm

Human Factors, Instrumentation, and Controls: General—II, Wed. am

Human Factors, Instrumentation, and Controls: General–III, Wed. pm

ISOTOPES AND RADIATION (IRD)

Production and Applications of Isotopes and Radiation, Mon. pm

(Best of Paper Session from ANTPC), Wed. am

Advancements in Radiation Measurement and Imaging Technology, Thurs. pm

Technical Sessions by Division

MATERIALS SCIENCE AND TECHNOLOGY (MSTD)

Accident Tolerant Fuels, Mon. pm

Advanced Measurement Techniques, Tues. am

Nuclear Fuels and Materials in Fast Reactors, Tues. pm

Post-Irradiation Examination, Wed. am

Nuclear Fuels, Wed. pm

(Research Opportunities in Advanced Fission and Fusion Materials–Panel), Wed. pm

Materials Aging in Nuclear Plant Operations (metals, concrete, cables, condition monitoring, etc.), Thurs. am

Materials Aging in Nuclear Fuel Storage (aging fuels management, cask degradation, etc.) and Advanced Manufacturing, Thurs. pm

Challenges and Opportunities with Accelerated Qualification of LWR ATF Cladding and Fuel Materials–Panel, Thurs. pm

MATHEMATICS AND COMPUTATION (MCD)

Current Issues in Computational Methods–Roundtable, Mon. pm

Monte Carlo Methods, Tues. am

Deterministic Transport Methods, Tues. pm

Computational Methods, Wed. am

Mathematical Modeling, Analytic Solutions, and Benchmarks, Wed. pm

Uncertainty Quantification and Sensitivity Analysis—I, Wed. pm

Uncertainty Quantification and Sensitivity Analysis—II, Thurs. am

NUCLEAR CRITICALITY SAFETY (NCSD)

Past, Present and Future Validation Methods in International Criticality Safety Assessment–Panel, Mon. pm

(Critical and Subcritical Experiments), Tues. am

Recent Nuclear Criticality Safety Program Technical Accomplishments, Tues. pm

Data, Analysis and Operations in Nuclear Criticality Safety—I, Wed. am

Data, Analysis and Operations in Nuclear Criticality Safety—II, Wed. pm

Current Spent Fuel Pool Nuclear Criticality Safety Issues for NRC Licensees–Panel, Wed. pm

Membership Challenge Activity Debrief and Solution Discussion–Panel, Wed. pm

ANS-8 Standards Process, Current Revisions, and Connections to Wider Standards Organizations–Panel, Thurs. am

ANS-8 Standards Forum, Thurs. am

NUCLEAR INSTALLATIONS SAFETY (NISD)

Nexus Between Ethics and Nuclear Safety Culture–Panel, Mon. pm

Technical Approach for Defense in Depth for Advanced Reactors–Panel, Tues. am

NRC Spent Fuel Pool Level 3 PRA Insights–Panel, Tues. pm

Technical Issues with Proposed Revision to NRC Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants"–Panel, Wed. am

Nuclear Installations Safety: General—I, Wed. pm

Nuclear Installations Safety: General—II, Thurs. am

Current Topics in Probabilistic Risk Analysis, Wed. pm

Highlights from PSA 2017–Panel, Thurs. pm

NUCLEAR NONPROLIFERATION POLICY (NNPD)

Dwight D. Eisenhower Award Special Session—I: Honoring the 2017 Award Recipients–Panel, Mon. pm

Dwight D. Eisenhower Award Special Session—II: Nuclear Nonproliferation Policy–Panel, Mon. pm

Critical and Subcritical Experiments, Tues. am

Export Controls–Panel, Tues. pm

Best of Paper Session from ANTPC, Wed. am

Progress in Reducing the Threat of HEU Around the World–Panel, Wed. pm

Nuclear Nonproliferation Policy: General, Wed. pm

SCALE/ORIGEN for Nuclear Nonproliferation and Safeguards Applications–Tutorial, Thurs. am

Specialty Fuel for Space/Defense Reactors: Discussion on Performance Specifications and Nonproliferation Policy–Panel, Thurs. pm

OPERATIONS AND POWER (OPD)

Nuclear Hybrid Energy Systems–Panel, Mon. pm

(Existing Nuclear as a Bridge to Advanced Nuclear–Panel), Tues. am

Thermal Energy Storage Systems and Their Integration with NPPs, Tues. am

The GAIN Initiative for Advanced Nuclear Power Plants–Panel, Tues. pm

Advanced/Gen-IV Reactors—I, Wed. am

Advanced/Gen-IV Reactors—II, Wed. am

(Current Spent Fuel Pool Nuclear Criticality Safety Issues for NRC Licensees–Panel), Wed. pm

New Nuclear Construction Around the World: Status Report–Panel, Wed. pm

The DNP Initiative for U.S. Nuclear Power Plants–Panel, Wed. pm

Operations and Power: General—I, Thurs. am

RADIATION PROTECTION AND SHIELDING (RPSD)

Advanced Reactors/Source Term, Raidiological, and Accident Evaluations–Panel, Mon. pm

Radiation Protection and Shielding: General, Tues. am

Computational Tools for Radiation Protection and Shielding, Wed. am

Dose Rates Assessment due to Spent Fuel and Activated Materials, Wed. pm

SCALE/ORIGEN for Shielding Source Term Generation–Tutorial, Thurs. pm

Technical Sessions by Division

REACTOR PHYSICS (RPD)

Reactor Physics: General—I, Mon. pm

Reactor Physics: General—II, Wed. pm

Reactor Physics: General—III, Thurs. am

U.S. and UK International Collaboration on Nuclear R&D—I–Panel, Tues. am

U.S. and UK International Collaboration on Nuclear R&D—II, Tues. am

Reactor Physics Challenges in Molten Salt Reactor Design—I, Tues. pm

Reactor Physics Challenges in Molten Salt Reactor Design—II, Wed. pm

Reactor Physics Challenges in Molten Salt Reactor Design—III–Panel, Wed. pm

Reactor Analysis Methods—I, Tues. pm

Reactor Analysis Methods—II, Wed. pm

Reactor Analysis Methods—III, Thurs. pm

Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—I, Wed. am

Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—II–Panel, Wed. am

Reactor Physics Challenges in LWR Fleet–Panel, Wed. pm

Reactor Physics Design, Validation and Operational Experience—I, Thurs. am

Reactor Physics Design, Validation and Operational Experience—II, Thurs. pm

THERMAL HYDRAULICS (THD)

Thermal-Hydraulic Collaborations in Industry, Academia and Labs–Panel, Mon. pm

General Thermal Hydraulics—I, Mon. pm

General Thermal Hydraulics—II, Tues. am

Two-Phase Flow Fundamentals, Tues. am

Thermal Hydraulics for Nuclear Space Applications–Panel, Tues. pm

Thermal Hydraulics of Advanced Reactors, Tues. pm

Computational Thermal Hydraulics—I: Computational Fluid Dynamics, Wed. am

Computational Thermal Hydraulics—II, Thurs. am

Experimental Thermal Hydraulics—I: Focus on Advanced Instrumentation, Wed. am

Experimental Thermal Hydraulics—II, Wed. pm

Young Professional Thermal-Hydraulic Research Competition, Wed. pm

Severe Accident Modeling and Experiments for Advanced Reactor Safety, Wed. pm

Severe Accident Modeling and Experiments for Light Water Reactors, Thurs. pm

YOUNG MEMBERS GROUP (YMG)

Perspectives on Diversity in the Nuclear Industry–Panel, Mon. pm

(Nuclear Hybrid Energy Systems–Panel), Mon. pm

(Dwight D. Eisenhower Award Special Session—II: Nuclear Nonproliferation Policy–Panel), Mon. pm

(Nexus Between Ethics and Nuclear Safety Culture–Panel), Mon. pm

(Critical and Subcritical Experiments), Tues. am

Is a Start-up Right for You?–Panel, Tues. am

Existing Nuclear as a Bridge to Advanced Nuclear–Panel, Tues. am

Perspectives on the ANS Congressional Fellowship–Panel, Tues. pm

Potent Policies: Understanding ANS Position Papers–Panel, Tues. pm

(The GAIN Initiative for Advanced Nuclear Power Plants–Panel), Tues. pm

The Importance of ANS Standards–Panel, Wed. am

Nuclear's Role in Climate Change–Panel, Wed. am

(Advanced/Gen-IV Reactors—I), Wed. am

(Advanced/Gen-IV Reactors—II), Wed. am

(Current Spent Fuel Pool Nuclear Criticality Safety Issues for NRC Licensees–Panel), Wed. pm

Advocacy and Communication: A Clean Energy Discussion–Panel, Wed. pm

Nuclear Policy 101–Panel, Wed. pm

(Young Professional Thermal-Hydraulic Research Competition), Wed. pm

(The DNP Initiative for U.S. Nuclear Power Plants–Panel), Wed. pm

(ANS-8 Standards Process, Current Revisions, and Connections to Wider Standards Organizations–Panel), Thurs. am

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Commercializing New Reactor Technologies—Fuel Cycle Implications and Challenges

Sponsored by: FCWMD
Session Organizer: Steven L. Krahn *(Vanderbilt Univ)*
Chair: Andrew G. Sowder *(EPRI)*
Location: Delaware A **Time:** 1:00-2:20 pm

1:05 pm: Preliminary Risk Assessment of a Generalized Molten Salt Reactor Off-Gas System, Brandon Chisholm, Steven Krahn, Paul Marotta, Allen Croff *(Vanderbilt Univ)*

1:30 pm: Historical Assessment of Government-Industry Roles in the Research, Development, Demonstration, and Deployment of Nuclear Power, Steven Krahn *(Vanderbilt Univ)*, Andrew Sowder *(EPRI)*

1:55 pm: Public-Private Partnering for Advanced Nuclear Reactor Development–Recent Proposals, Paul J. Marotta, Steven L. Krahn *(Vanderbilt Univ)*

Molten Salt Processing-Online Processing Redox

Sponsored by: FCWMD
Session Organizers: Charles Forsberg *(MIT)*, Kathryn D. Huff *(Univ Illinois)*
Chair: Guillermo Daniel DelCul *(ORNL)*
Location: Delaware A **Time:** 2:30-4:10 pm

2:30 pm: New Processing Technologies for Salt-Cooled and Salt-Fueled Reactors: Tritium, Redox, Salt Processing and Waste Treatment, C. W. Forsberg *(MIT)*

2:55 pm: Online Reprocessing Simulation for Thorium-Fueled Molten Salt Breeder Reactor, Andrei Rykhlevskii, Alexander Lindsay, Kathryn Huff *(Univ Illinois)*

3:20 pm: Controlling Corrosion and Tritium in a Fluoride-Salt-Cooled High-Temperature Reactor (FHR) Using Hydrogen, S. Lam, R. Ballinger, C. W. Forsberg *(MIT)*

3:45 pm: Electorefiner Salt Analytes Concentration Monitoring Through Voltammetric Methods, Chao Zhang, Michael F. Simpson *(Univ Utah)*

Past, Present and Future Validation Methods in International Criticality Safety Assessment–Panel

Sponsored by: NCSD
Session Organizer: Tatiana Ivanova *(OECD Nuclear Energy Agency)*
Chair: Margaret Marshall *(INL)*
Location: Delaware B **Time:** 1:00-4:15 pm

Preventing criticality accidents and improving the economics has driven advancements in Monte Carlo methods, as well as, the adoption of sensitivity and uncertainty analysis in criticality safety assessments. Increasingly, these methods are being used in the design phase of new integral experiments to ensure that data generated will reduce uncertainties. The modern criticality safety case hinges on international data, both integral experiments and differential nuclear data underpinning the Monte Carlo results. But have these advances in criticality safety analysis made us safer, or by removing conservatisms are we more likely to encounter a black swan event? And have the methods improved the economics, or are the gains offset by the increased burden owing to the complexity of the new methodologies? The panel will compare historic and modern criticality safety cases and provide international perspectives of balancing risk and economics. This includes 5 parts: (1) Historical perspective (2) USA speaker putting together a validation case (3) International speaker discussing a validation case (4) Regulatory perspective (5) New cutting edge methods

Panelists:
Andrew Barto *(NRC)*
Axel Hoefer *(Areva)*
Calvin Hopper (*ORNL)*
Mike Zerkle (*NNL)*
Brad Rearden *(ORNL)*

Technical Sessions: Monday October 30

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Accident Tolerant Fuels

Sponsored by: MSTD
Session Organizer: Kenneth J. Geelhood *(PNNL)*
Chair: Arthur M. Motta *(Penn State)*
Location: Virginia A **Time:** 1:00-3:25 pm

1:05 pm: Radiation Tolerance of Multilayer (TiN, TiAlN) Ceramic ATF Coatings, Jing Hu *(ANL)*, Douglas Wolfe, Arthur Motta *(Penn State)*, Jie Wang, Mark Kirk *(ANL)*

1:30 pm: Hydrothermal Corrosion of SiC/SiC Composites: The Effect of Material Loss on Mechanical Performance, S. L. Oswald, H. E. Khalifa, K. S. Shapovalov, G. M. Jacobsen *(General Atomics)*, R. J. Jacko *(Westinghouse)*, C. P. Deck *(General Atomics)*

1:55 pm: Development of Accident Tolerant Metallic Multilayer Composites for LWRs, Samuel W. McAlpine, Michael P. Short *(MIT)*

2:20 pm: Characterization of U_3Si_2 Surrogates Along the Development of an Additive Manufacturing Process, Jhonathan Rosales, Isabella van Rooyen, Clemente Parga *(INL)*

3:00 pm: Impact of FeCrAl ATF Concept on BWR Upper Internal Structures During Station Blackouts, Kevin R. Robb *(ORNL)*

Production and Applications of Isotopes and Radiation

Sponsored by: IRD **Cosponsored by:** BMD
Session Organizer: Kenan Unlu *(Penn State)*
Chair: Brenden J. Heidrich *(INL)*
Location: Virginia B **Time:** 1:00-4:40 pm

1:05 pm: Neutron Energy Effects on the Activation of Stainless Steel Foils, John J. Goodell *(Univ Maryland)*, Christine M. Egnatuk, Stephen W. Padgett, Bryan B. Bandong, Kevin E. Roberts *(LLNL)*, Alice C. Mignerey *(Univ Maryland)*

1:30 pm: A Peculiar Case of an Actinide-Induced Shift of the "Gadolinium Break", Georg Steinhauser *(Univ Hannover)*

1:55 pm: A Monte Carlo Radioisotope Source Model for Betavoltaic Batteries, Tariq R. Alam, Mark A. Pierson *(Virginia Tech)*, Mark A. Prelas *(Univ Missouri)*

2:20 pm: Evaluation of Surrogate Special Nuclear Material (SNM) Sources for Use in Training and Modeling, Zachary Scholz, Matthew Schell, Marshall Millett *(U.S. Naval Academy)*

3:00 pm: Synthesis of Au@TiO_2 NCs by X-Ray Radiolytic and Deposition-Precipitation Methods, M. C. Molina Higgins, J. V. Rojas *(Virginia Commonwealth Univ)*

3:25 pm: Experimental Measurement of ^{58}Ni Alpha-Capture Reactions, Kyle M. Paaren, Hyoung-Koo Lee *(Missouri Univ Sci. Technol.)*

3:50 pm: Mo-99 Production via DT Fusion Driven Subcritical Assembly, Greg Piefer, Ross Radel *(Phoenix Nuclear Labs)*

4:15 pm: Analysis of a Conceptual Fast Neutron Island in the Missouri S&T Reactor, Meshari Al Qahtani, Ayodeji B. Alajo *(Missouri Univ Sci. Technol.)*

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Perspectives on Diversity in the Nuclear Industry–Panel

Sponsored by: YMG
Session Organizer: Kalin Kiesling *(Univ Wisconsin, Madison)*
Chair: Harsh S. Desai *(NEI, Energy Solutions, LLC)*
Location: Virginia C **Time:** 1:00-4:15 pm

With the growth of nuclear science and engineering, we see progressively diverse participants within the field. These participants have a range of experiences from both student and professional perspectives. In this session, the panelists will lead discussions to address challenges and strategies for continued conversations of diversity in the nuclear community. The panel will include members from different occupational, racial, ethnic, gender, and sexuality backgrounds. The panel will include ample time for discussion with the audience after hearing from each panelist.

Panelists:
Samuel Brinton *(Core Solutions Consulting)*
Lisa Marshall *(NCSU)*
Paul P. H. Wilson *(Univ Wisconsin, Madison)*
Pam Cowen *(NEI)*

Current Issues in Computational Methods–Roundtable

Sponsored by: MCD
Session Organizer and Chair: Dmitriy Y. Anistratov *(NCSU)*
Location: Maryland A **Time:** 1:00-4:15 pm

Transport Algorithms for Multiphysics Problems: Needs and Challenges

Current advances in computational methods for multiphysics problems lead to new requirements and opportunities in developing algorithms for solving the particle transport equation. Advanced software environments and computer architecture influence the way transport algorithms are formulated and implemented. Novel methodologies are needed to perform large-scale simulations of multiphysics phenomena with high resolution. This roundtable is intended to stimulate a discussion on advanced computational transport methods for complex multiscale problems in science and engineering.

Panelists:
Thomas Brunner *(LLNL)*
Daniel Gill *(NNL)*
Robert Lowrie *(LANL)*

Best of NPIC-HMIT 2017—I: Advances in Instrumentation and Control–Panel

Sponsored by: HFICD
Session Organizer: Jamie Baalis Coble *(Univ Tenn, Knoxville)*
Chair: Sacit M. Cetiner *(ORNL)*
Location: Maryland C **Time:** 1:00-4:15 pm

This panel will highlight high impact contributions in the area of instrumentation and controls from the 2017 NPIC-HMIT conference.

Panelists:
Updates on I&C Activities at NEI, Jason Remer *(NEI)*
Development of a Utility Computer-Based Training Program on Setpoint Methodology for Nuclear Power Plants, Edward L. Quinn *(Technology Resources)*
Near-Term Improvements to the Digital I&C Regulatory Infrastructure, David Rahn *(NRC)*
I&C Simplification, Reliability, Diversification and the Use of FPGAs, Brian Arnholt *(NuScale)*
Risk Informed Cyber Security for Nuclear Power Plants, Phil Turner *(SNL)*

Technical Sessions: Monday October 30

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Advanced Reactor Source Term, Radiological, and Accident Evaluations–Panel

Sponsored by: RPSD
Session Organizer and Chair: Dominic Napolitano *(Enercon Services, Inc.)*
Location: Maryland B **Time:** 1:00-4:15 pm

This panel will discuss advanced reactors/SMRs:

- Unique radiological features and issues
- Normal and accident source terms
- Normal and accident dose assessment methodology
- Chapter 15 accidents for non-LWR advanced reactors
- EPZ methodology and assessments for AR/SMR
- Licensing issues and open questions

Panelists:
Eric Williams *(TerraPower)*
Eben Mulder *(X-Energy)*
Alex Young *(TVA)*
William Reckley *(NRC)*
Mark Shaver *(NuScale Power)*
Charles Forsberg *(MIT)*
Caroline Cochran *(Oklo Inc.)*

Nuclear Hybrid Energy Systems–Panel

Sponsored by: OPD
Session Organizer: Shannon M. Bragg-Sitton *(INL)*
Chair: Piyush Sabharwall *(INL)*
Location: Washington 1 **Time:** 1:00-3:05 pm

Reduction in greenhouse gas could be achieved by non-emitting variable renewable resources. However, among other impacts, increased use of variable renewables can result in a requirement for baseload generators to operate in a load-following mode. Integration of nuclear and renewable generators in a hybrid energy system (N-R/HES) is being considered as an option to meet both electrical and thermal energy needs. The conceptual N-R/HES share many of the same requirements as observed for space power systems, likely also to be designed for multipurpose application. Panelists will discuss the technical merits, foreseen challenges, lessons learned (derived from the testing program for space nuclear surface power systems) and path forward for the development of N-R/HES.

Panelists:
Overview of Nuclear Hybrid Energy Systems, Shannon Bragg-Sitton *(INL)*
Technology Perspectives and Opportunities, Sunita Satyapal *(EERE)*
Representative from the DOE Office of Nuclear Energy to be announced.
Policy Perspectives, Ryan Fitzpatrick *(Third Way)*
Representative from Clean Air Task Force to be announced.

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Thermal-Hydraulic Collaborations in Industry, Academia and Labs–Panel

Sponsored by: THD
Session Organizer: Elia Merzari *(ANL)*
Cochairs: John Phillip *(INL)*, Sama Bilbao y Leon *(Virgina Commonwealth Univ)*
Location: Washington 2 **Time:** 1:00-4:15 pm

Thermal hydraulics is arguably at the center of light-water reactor technology. Yet despite its importance, research in this area is often compartmentalized: with universities, industry and national laboratories interacting on a limited basis. This has limited the innovation and slowed the adoption of disruptive technologies such as advanced modeling and simulation and novel measurement techniques. This session aims to illustrate some success stories of collaborations between universities, industry and national laboratories to further innovation. Moreover, we discuss how the thermal hydraulics community can move forward and further foster collaboration, considering the emergence of novel programs such as GAIN.

Panelists:
Shane Johnson *(DOE)*
Chul-Hwa Song *(KAERI)*
Ed Blandford *(Kairos Power)*
Brian Jackson *(TerraPower)*
Wade Marcum *(Oregon State Univ)*

General Thermal Hydraulics—I

Sponsored by: THD
Session Organizer: Elia Merzari *(ANL)*
Cochairs: Matthieu Andre *(GWU)*, Annalisa Manera *(Univ Michigan)*
Location: Washington 3 **Time:** 1:00-3:50 pm

1:05 pm: Flow Pattern Analysis in a Large-Scaled Enclosed Space, Si Y. Lee *(SRNL)*

1:30 pm: In-Core Coolant Temperature Measurements of TRIGA Mark II Research Reactor, Dustin Woolsey, Wenkai Fu, Dan W. Gould, Hitesh Bindra, Jeremy A. Roberts *(Kansas State Univ)*

1:55 pm: Numerical Evaluation of the Uncertainty of Double-Sensor Conductivity Probe, D. Wang, Y. Liu *(Virginia Tech)*, J. D. Talley *(Naval Nuclear Lab)*

2:20 pm: Temperature Distribution in a Scaled 9 Riser Water Reactor Cavity Cooling System (WRCCS), N. Quintanar, S. Yang, L. White, R. Vaghetto, Y. Hassan *(Texas A&M)*

3:00 pm: Experimental Study on Helium Natural Convection Heat Transfer for Two Coolant Flow Channels Within Prismatic Very High Temperature Reactor, Ibrahim A. Said, Mahmoud M. Taha, S. Usman, M. H. Al-Dahhan *(Missouri Univ Sci. Technol.)*

3:25 pm: Advection and Diffusion Calculations Supporting Fuel Fragmentation, Relocation, and Dispersion Experiments, G. D. Latimer, W. R. Marcum *(Oregon State)*, W. F. Jones *(INL)*

Immediately following the General Thermal Hydraulics—I session, an award ceremony for the Thermal Hydraulics Division's Technical Achievement Award (TAA) will take place. The recipient of the award will deliver a TAA lecture.

Technical Sessions: Monday October 30

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Dwight D. Eisenhower Award Special Session—I: Honoring the 2017 Award Recipients–Panel

Sponsored by: NNPD
Session Organizers: James W. Behrens *(U.S. Navy – ret.)*, John C. Browne *(LANL – ret.)*, Steve Nesbit *(Duke Energy)*
Moderator: Susan E. Eisenhower *(Chairman Emeritus, Eisenhower Institute)*
Location: Washington 4 **Time:** 1:00-2:45 pm

The American Nuclear Society's newest division, the Nuclear Nonproliferation Policy Division (NNPD), introduced the Dwight D. Eisenhower Award back in 2015 to acknowledge and honor individuals who have made outstanding contributions to the field of nuclear nonproliferation. The 2015 honorees were Former U.S. Secretary of State George P. Shultz and Distinguished Physicist Dr. Sidney D. Drell, both from the Hoover Institution, Stanford University. For 2017, the honorees are Senators Samuel A. Nunn, Jr., and Richard G. Lugar together with Dr. Siegfried S. Hecker. This technical session begins by honoring these three men and then turns to current-day situations.

Panelists:
The Honorable Samuel A. Nunn, Jr. *(Former U.S. Senator of Georgia; NTI)*
The Honorable Richard G. Lugar *(Former U.S. Senator of Indiana; The Lugar Center)*
Siegfried S. Hecker *(Stanford Univ)*

Dwight D. Eisenhower Award Special Session—II: Nuclear Nonproliferation Policy–Panel

Sponsored by: NNPD **Cosponsored:** YMG
Session Organizers: Gene Carpenter *(DOE)*, Kelsey Amundson *(DNFSB)*
Cochairs: Shaheen Dewji *(ORNL)*, Gene Carpenter *(DOE)*
Location: Washington 4 **Time:** 3:05-4:15 pm

The panelists will provide observations on the state of nuclear nonproliferation in the world today. Subjects for discussion will include the execution of the agreement with Iran, tensions and developments on the Korean peninsula, and the ongoing effort to enact a nuclear weapons ban convention. The panelists will include an outlook for the future of nuclear nonproliferation, suggestions for what the American public should know, and how ANS can provide this information.

Panelists to be announced.

Student Design Competition

Sponsored by: ETWDD **Cosponsored by:** ANSTD
Session Organizer and Chair: Travis W. Knight *(Univ South Carolina)*
Location: Hoover **Time:** 1:00-3:05 pm

Undergraduate Category

1:05 pm: Overview of Molten Salt Test Reactor Conceptual Design, Brandon Little, Calvin Parkin, Ken Zander *(Univ Wisconsin, Madison)*

1:35 pm: RadLock: Radiation Smart Safe, Caroline M. Colbert, Alexandra R. Delmore, Luisa R. Kenausis, Jonathan T. Morrell, Michael P. Short *(MIT)*

Graduate Category

2:05 pm: Two-Stage Cargo Scanning Using Active Interrogation, Kris Ogren, Valerie Nwadeyi, Felicia Sutanto, Adam Withers *(Univ Michigan)*

2:35 pm: 1 GWe Proliferation Resistant Molten Salt Reactor (PRMSR) Design, Matthew Urban, Russell Jarmer, Fran Mallett, Jeffrey King *(Colorado School of Mines)*

MONDAY, OCTOBER 30

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Nexus Between Ethics and Nuclear Safety Culture–Panel

Sponsored by: NISD **Cosponsored by:** YMG
Session Organizer and Chair: Charles R. Martin *(Natl. Security Technol. LLC)*
Location: Coolidge **Time:** 1:00-4:15 pm

This session is intended to explore the nexus between ethics and nuclear safety culture via a panel of experts in both areas. The intent is to reinforce the ANS Code of Ethics in light of our responsibilities as professionals to dedicate ourselves to improving the understanding of nuclear science and technology, appropriate applications, but also the potential consequences of their use. The subject of nuclear safety culture is one that is key to this ethical position, and it deserves periodic review and discussion to ensure that safety and ethics are prominent in our technical programs.

Panelists:
Professional Judgment: What, How, When?, Robert D. Busch *(Univ New Mexico)*
Ethical Issues in Nuclear Engineering and Safety Culture, Charles R. (Chip) Martin *(National Security Technologies, LLC)*
Due Diligence in Professional Engineering: When and How, Glenn E. Sjoden *(Univ Florida)*
How to Handle Management/Employer Pressure to Attain an Incorrect Result, Charlotta E. Sanders *(Sanders Eng)*
Promoting Ethics in Professional Engineering, Vince Gilbert *(EXCEL Services)*

Reactor Physics: General—I

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Dimitrios Cokinos *(BNL)*
Location: Harding **Time:** 1:00-4:35 pm

1:05 pm: Modeling of Subcritical PWR with Fixed Neutron Source Using MPACT, Cole A. Gentry, Benjamin S. Collins, Andrew Godfrey *(ORNL)*

1:30 pm: Improvement of 3D Power Connection Method in the Online Core Monitoring System OASIS, Joo Il Yoon, Hyeong Seog Kim, Hae Seuk Woo, Hae Chan Lee *(KEPCO)*

1:55 pm: Verification and Estimation of Thermal Neutron Capture Cross Sections of Rare Earth Elements, Atsunori Terashima *(Tokyo Inst. Technol; Univ California, Irvine)*, Mikael Nilsson *(Univ California, Irvine)*, Masaki Ozawa, Satoshi Chiba *(Tokyo Inst. Technol.)*

2:20 pm: Solutions to VERA Core Physics Benchmark Progression Problems 1 to 6 Based on RMC, Zhen Luo, Juanjuan Guo, Ganglin Yu, Kan Wang, Shichang Liu *(Tsinghua Univ)*

3:00 pm: Tutorial Series on Characterization of Uncertainty (TUSC): Basic Definitions and Objectives, Hany S. Abdel-Khalik *(Purdue Univ)*

3:25 pm: Tutorial Series on Characterization of Uncertainty (TUSC): Model Calibration and Data Adjustment Techniques, Hany S. Abdel-Khalik *(Purdue Univ)*

3:50 pm: An Overview of p-CMFD Acceleration and its Applications to Reactor Physics Transport Calculation, Nam Zin Cho *(KAIST)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Used Fuel Management Status–Panel

Sponsored by: FCWMD
Session Organizer: Steven P. Nesbit *(Duke Energy Corp.)*
Cochairs: Steven P. Nesbit *(Duke Energy Corp.)*, Ruth F. Weiner *(Boston Government Services)*
Location: Delaware A **Time:** 8:00-11:40

Progress on high-level radioactive waste (HLW) management in the United States halted in 2010 when DOE cancelled the Yucca Mountain geologic repository project. In 2017, the leading opponent of Yucca Mountain, ex-Senator Harry Reid of Nevada, retired from his position of influence. The past year has seen a renewed and unfettered Congressional dialog on Yucca Mountain and consolidated storage of used fuel, and a range of HLW initiatives moved back into the realm of the possible. A panel of influential Congressional staff and Administration personnel will review 2017 activity and peer into the cloudy HLW crystal ball.

Panelists:
Tyler Owens *(Senate Appropriations Committee Staff)*
David Blee *(U.S. Nuclear Infrastructure Council)*
Other panelists to be announced.

Radiation Therapy, Standards, and Effects

Sponsored by: BMD
Session Organizer and Chair: Robert Gregory Downing *(NIST)*
Location: Delaware B **Time:** 8:00-10:25 am

8:05 am: A Novel Field Mapping System for a PET Cyclotron, J. Yang, M.W. Fan, T.Q. Yu, Y.Q. Xiong, J. Huang *(Huazhong Univ Sci. Technol.)*

8:30 am: Pencil Beam Proton Dose Algorithm for Proton Therapy Treatment Planning System KylinRay-IMPT, Hui Wang, Huaqing Zheng, Jing Song, FDS Team *(Institute of Nuclear Energy Safety Technology)*

8:55 am: Influence of Gold Particle Concentration and X-Ray Energy in Radiosensitization, Miguel Toro Gonzalez, Maria Molina Higgins, Jessika Rojas *(Virginia Commonwealth Univ)*

9:35 am: 3D Printing Physical Phantoms for the Radiation Exposure Assessment of Overweight and Obese Patients, Tetyana Rudenko, Matthew Mille, Keith Griffin, Roberto Maass-Moreno, Choonsik Lee *(National Inst. Health)*

10:00 am: Composition of CT Lung Density Reference Using Prompt Gamma Activation Analysis, H. Heather Chen-Mayer, Danyal Turkoglu, Rick Paul, Zachary Levine *(NIST)*

Advanced Measurement Techniques

Sponsored by: MSTD
Session Organizer and Chair: Kenneth J. Geelhood *(PNNL)*
Location: Virginia A **Time:** 8:00-11:40 am

8:05 am: XANES Study of Fe and Nb Oxidation in Zr-2.5Nb Oxide Layers, Brendan Ensor *(Penn State; Naval Nuclear Lab)*, Michael Moorehead *(Univ Wisconsin, Madison)*, John R. Seidensticker *(Naval Nuclear Lab)*, Adrien Couet *(Univ Wisconsin, Madison)*, Arthur T. Motta *(Penn State)*

8:30 am: Thermal Characterization of Materials via a Blu-Ray Based Scanning Fluorescence Microscope, Samuel Hayden, Troy Munro *(BYU)*

8:55 am: Thermal Conductivity Measurement of Zircaloy-4: Extended Raman Thermometry Method, Hao Wang, Debapriya Pinaki Mohanty, Vikas Tomar *(Purdue Univ)*

9:35 am: High Temperature Radiation Resistant Diamond Temperature Sensor, Tong June Kim *(Univ Wisconsin, Madison)*, Kurt Davis *(INL)*, Mark H. Anderson, Michael Corradini *(Univ Wisconsin, Madison)*

10:00 am: Design the Prototype Hybrid L-Edge/XRF Densitometer for Analysis of Nuclear Material, Sungyeop Joung, Seunghoon Park *(KINAC)*

10:25 am: Quantifying Radiation Damage in Helium-Irradiated Aluminum 7075-T6 Using Wigner Energy Measurements, Rachel Connick, Charles Hirst, Sara E. Ferry, Michael Short, Penghui Cao, R. Scott Kemp *(MIT)*

10:50 am: Neutron Radiography Using a High-Flux Compact Thermal Neutron Generator, Michael J. Taylor, Chris Seyfert, Evan Sengbusch, Ross Radel *(Phoenix Nuclear Labs)*

11:15 am: The Creation of a High Temperature Irradiation Facility in the Ohio State Research Reactor, Brandon A. Wilson, Kelly M. McCary, Neil R. Taylor, Andrew Kauffman, Thomas E. Blue, Raymond Cao *(Ohio State)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Critical and Subcritical Experiments

Sponsored by: NNPD **Cosponsored by:** NCSD, YMG
Session Organizer: Jesson D. Hutchinson *(LANL)*
Chair: Rian M. Bahran *(LANL)*
Location: Virginia B **Time:** 8:00-11:15 am

8:05 am: Eliminating Detector Response in Neutron Multiplicity Measurements for Model Evaluation, Alex McSpaden, Mark Nelson, Jesson Hutchinson *(LANL)*

8:30 am: Improved Figure of Merit for Feynman Histograms, Jennifer Arthur *(LANL, Univ Michigan)*, Rian Bahran, Jesson Hutchinson, Travis Grove *(LANL)*, Sara Pozzi *(Univ Michigan)*

8:55 am: Prompt Neutron Decay Constant Fitting Using the Rossi-Alpha and Feynman Variance-to-Mean Methods, J. Hutchinson, G. McKenzie, J. Arthur, M. Nelson *(LANL)*, W. Monange *(IRSN)*

9:35 am: Design of a Highly-Enriched Uranium (HEU) Metal Fast Burst Supercritical Assembly, Victoria Hagopian, Chuck Floyd, Kevin Horlback, Stephen Langellotti, R. Eric Morin, T. Adam Wilson, Jonathan Coburn, John Mattingly *(NCSU)*

10:00 am: Determination of the Optimal Time Bin Width for the Rossi-Alpha Analysis of Highly Subcritical Fast Metal Systems, Kimberly L. Klain *(LANL)*

10:25 am: Prompt Neutron Decay Constant Measurements on a Polyethylene-Reflected Sphere of Highly Enriched Uranium, George McKenzie, Jesson Hutchinson, William Myers *(LANL)*

10:50 am: Cold Critical Pre-Experiment Simulations of KRUSTy, Kristin Smith *(Univ Florida)*, Rene Sanchez *(LANL)*

Is a Start-up Right for You?–Panel

Sponsored by: YMG
Session Organizer: Louis J. Chapdelaine *(Univ Wisconsin, Madison)*
Chair: Timothy M. Crook *(Transatomic Power Corp)*
Location: Virginia C **Time:** 8:00-9:20 am

In this time of innovation and advocacy in nuclear science and technology, there is an increasing number of small startups. In this session, startup founders and employees will share their experiences about their careers in nuclear startups. Attendees will then have the opportunity to ask questions to find out if a career at a nuclear startup is right for them.

Panelists:
Mark Shaver *(NuScale)*
John Kutch *(Terrestrial)*
Aries Loumis *(Lumos)*

Existing Nuclear as a Bridge to Advanced Nuclear–Panel

Sponsored by: YMG **Cosponsored by:** OPD
Session Organizer and Chair: Timothy M. Crook *(Transatomic Power Corp.)*
Location: Virginia C **Time:** 9:35-11:40 am

Across the nation, aging nuclear power plants continue to safely and reliably generate clean energy. Meanwhile, many advanced nuclear plant designs promise increased safety, lower construction costs, and greater efficiency compared to the aging fleet, but these are not expected to be ready for widespread commercial deployment until the 2030s. While many plants are applying for 60-year and even 80-year life extensions, many others are faced with difficult market conditions that threaten early closure. This presents challenges for state and federal governments to meet clean energy goals, for the industry in maintaining jobs and expertise, and for communities that are dependent on local plants and taxes to survive. This panel will make the case for preservation of the existing nuclear fleet as a necessity to bridge the technological, economic, and policy hurdles along the path to deployment of advanced reactors.

Panelists:
Vince Gilbert *(EXCEL Services)*
Samuel Brinton *(Core Solutions Consulting)*
Mark Shaver *(NuScale)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Monte Carlo Methods

Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Michael W. Hackemack *(KAPL)*
Location: Maryland A **Time:** 8:00-11:15 am

8:05 am: The Distribution of Neutron Family Size in Monte Carlo Iterated Fission Source Calculations, Anudha Mittal, Thomas M. Sutton *(Naval Nuclear Lab)*

8:30 am: A Comparative Study on CMFD and p-CMFD Acceleration in the Monte Carlo Analysis, Inhyung Kim, Yonghee Kim *(KAIST)*

8:55 am: Incorporation of a Multigroup Transport Capability in the OpenMC Monte Carlo Particle Transport Code, Adam G. Nelson *(Naval Reactor Headquarters),* Samuel Shaner, William Boyd *(MIT)*, Paul K. Romano *(ANL)*

9:35 am: Development of a Geometry Interface Tool for CAD to MC Conversion for RMC, Kaiwen Li, Xiaotong Shang, Kan Wang *(Tsinghua Univ)*

10:00 am: Burst Waiting Time Simulation of CALIBAN Pulse Reactor with RMC, Xiaotong Shang, Kan Wang *(Tsinghua Univ)*

10:25 am: Subcritical Multiplication Factor and Burnup Analysis of ADS with RMC, Xiaotong Shang, Jing Song, Yiran Wang, Jin Li, Ganglin Yu, Kan Wang *(Tsinghua Univ)*

10:50 am: Burnup and Activation Calculation Methods of SuperMC3.1 for Nuclear Reactor High Fidelity Simulation, Jing Song, Lijuan Hao, Yican Wu, FDS Team *(Inst. Nuclear Energy Safety Technol.)*

Best of NPIC-HMIT 2017—II: Advances in Human Factors and Human-Machine Interface–Panel

Sponsored by: HFICD
Session Organizer: Jamie Baalis Coble *(Univ Tenn., Knoxville)*
Chair: Clayton R. Scott *(Schneider Electric)*
Location: Maryland C **Time:** 8:00-11:40 am

This panel will highlight high impact contributions in the areas of human factors and human-machine interface from the 2017 NPIC-HMIT conference.

Panelists:
Migration to a Fully Integrated Control Room, Ken Scarola *(Nuclear Automation Engineering, LLC)*, Ken Thomas *(INL)*
Human Factors Verification at Plant Startup for the AP1000 Plant, Steve Kerch, Julie Reed *(Westinghouse)*
Sharing Human and Organizational Factors Lesson-Learned from the Implementation of Post-Fukushima Actions: An NEA Initiative Supporting Enhancement of Mitigation Capabilities for Extreme Events, David Desaulniers *(NRC)*
An Overview of IEEE Human Factors Standard Development Activities—2017, David Desaulniers *(UNRC)*

Radiation Protection and Shielding: General

Sponsored by: RPSD
Session Organizer: Irina I. Popova *(ORNL)*
Chair: Robert B. Hayes *(NCSU)*
Location: Maryland B **Time:** 8:00-11:15 am

8:05 am: Evaluating the Effectiveness of Common and Composite Shielding Materials at Lowering the Effective Whole Body Dose Equivalent Outside Earth's Lower Orbit, D. K. Bond, S. Bilbao y León *(Virginia Commonwealth Univ)*, R. C. Singleterry *(NASA)*

8:30 am: Preparation for Environmental Impact Assessment of Kori Unit 1 Decommissioning Based on the Review of U.S. NPPs, Sang-Ho Lee, Hyung-Woo Seo, Chang-Lak Kim *(KEPCO)*

8:55 am: Modeling Neutron Detection Outside of Reactor Shielding, B. M. van der Ende, L. Formenti, C. Dugal, A. Faurschou, J. Atfield *(CNL)*

9:35 am: Identification of a New Uncertainty Contributor in Radiological Aerosol Assays, Robert Bruce Hayes *(NCSU)*

10:00 am: Mass Correlation of Presumed Twin Air Filters for Emergency Response Applications, S. Joseph Cope, Robert B. Hayes *(NCSU)*

10:25 am: Gamma-Ray and Thermal-Neutron Filter Design for a TRIGA Penetrating Beam Port, John C. Boyington, Richard L. Reed, Ryan M. Ullrich, Jeremy A. Roberts *(Kansas State)*

10:50 am: Investigation of Alteration of ^{6}Li Enriched Neutron Shielding Glass, Jamie L. Weaver, Danyal J. Turkoglu *(NIST)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Thermal Energy Storage Systems and Their Integration with NPPs

Sponsored by: OPD
Session Organizer and Chair: Piyush Sabharwall *(INL)*
Location: Washington 1 **Time:** 8:00-10:00 am

8:05 am: Nuclear Combined Cycle Gas Turbine for Variable Electricity and Industrial Steam with Extended Firebrick Heat Storage, Charles Forsberg *(MIT)*, Per F. Peterson *(Univ California, Berkeley)*

8:30 am: PWR Response Under Load Following Maneuver Based on a Reduced Order Model, A. Gairola, H. Bindra *(Kansas State)*, Rizwan-Uddin *(Univ Illinois, Urbana-Champaign)*

8:55 am: Assessing the Value of Nuclear Hybrid Energy Systems Through LACE, W. Neal Mann *(Univ Texas, Austin)*, Piyush Sabharwall *(INL)*

9:35 am: Design of a Sensible Heat Peaking Unit for Small Modular Reactors, Konor Frick, J. Michael Doster *(NCSU)*, Shannon M. Bragg-Sitton *(INL)*

Two-Phase Flow Fundamentals

Sponsored by: THD
Session Organizer: Igor A. Bolotnov *(NCSU)*
Cochairs: Yang Liu *(NCSU)*, Dillon R. Shaver *(ANL)*
Location: Washington 2 **Time:** 8:00-11:40 am

8:05 am: Spatiotemporal Flow Structure of Counter-Current Two-Phase Annular Flows, Raito Goda, Katsuya Mori, Kosuke Hayashi, Shigeo Hosokawa, Akio Tomiyama *(Kobe Univ)*

8:30 am: Two-Phase Frictional Pressure Drop in Various Flow Regimes Through Double 90 Degree Elbows, Zhuoran Dang *(Purdue Univ)*, Zijiang Yang *(Xi'an Jiaotong Univ, Purdue Univ)*, Xiaohong Yang, Mamoru Ishii (*Purdue Univ)*

8:55 am: Vertical Downward Two-Phase Flow in a Large Diameter Pipe, Guanyi Wang *(Purdue Univ)*, Zhaoxu Li *(Purdue Univ, Tsinghua Univ)*, Xiaohong Yang, Mamoru Ishii *(Purdue Univ)*

9:35 am: Parametric Quenching Study for Surface Dependence of Rewetting Behavior, HangJin Jo, Hwasung Yeom, Michael L. Corradini *(Univ Wisconsin, Madison)*

10:00 am: Mechanistic Modeling of Boiling at High Heat Fluxes, Zeyong Wang, Michael Z. Podowski *(Rensselaer Polytechnic Inst.)*

10:25 am: A Comprehensive Uncertainty Evaluation of Double-Sensor Conductivity Probe Measurement, D. Wang, Y. Fu, Y. Liu *(Virginia Tech)*, J. D. Talley, T. Worosz, K. Hogan, J. Buchanan *(Naval Nuclear Lab)*

10:50 am: Hybrid Re-Distancing for Level Set Function in Two-Phase Flow Simulations, Nadish Saini, Igor A. Bolotnov *(NCSU)*

11:15 am: Experimental Research on Two Manners of Bubble Departure Characteristics, Xiao Renjie, Yan Xiao, Zan Yuanfeng *(Nuclear Power Inst. China)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

General Thermal Hydraulics—II

Sponsored by: THD
Session Organizer: Donna P. Guillen *(INL)*
Cochairs: W. David Pointer *(ORNL),* Minghui Chen *(Univ Michigan)*
Location: Washington 3 **Time:** 8:00-11:40 am

8:05 am: Nuclear Power Plant Fires and Explosions, V, Accident Overviews, Robert A. Leishear *(Leishear Engineering, LLC)*

8:30 am: RELAP5-3D Sensitivity Analysis of ECCS Pumps' Source Conditions During a Core Blockage Following a LB-LOCA in Hot Leg, Alessandro Vanni, Rodolfo Vaghetto, Yassin Hassan *(Texas A&M)*

8:55 am: Simulation of Condensation Experiments in a Slightly Inclined Tube with MARS-KS and TRACE Codes, Kyung Won Lee, Aeju Cheong, Min Ki Cho *(Korea Inst. Nuclear Safety)*

9:35 am: Improvement and Validation of Free Convection Heat Transfer Model for Tube Bundle in RELAP5, Xian Lin, Jiang Guangming, Yang Fan, Li Feng, Ran Xu *(Nuclear Power Inst. China)*

10:00 am: Evaluation of Control System Software CCF in APR1400, Min Shin Jung, Jong Cheol Park, Jong Ho Choi, Gyu Cheon Lee *(KEPCO)*

10:25 am: A Study of Turbulence Models for RCPSA Strength Assessment Using Unidirectional Fluid Structure Interaction, Ho Jung Lee, Sung Hwan Kim, Kwang Jeok Ko, Min Gyu Kim, Yeon Ho Cho, Hyun Min Kim *(KEPCO)*

10:50 am: A CHF Correlation for External Cooling of RPV Lower Head, Qiang Hu, Xiao Yan, Junchong Yu *(Nuclear Power Inst. China)*

11:15 am: Assessment of the Effect of Safety Injection Tank Performance on LBLOCA, Seung Hun Yoo, Young Seok Bang *(Korea Inst. Nuclear Safety)*

Decommissioning Rulemaking Committee–Panel

Sponsored by: DESD
Session Organizer and Chair: Richard J. St. Onge *(Black & Veatch)*
Location: Washington 4 **Time:** 8:00-11:40 am

This panel brings key decision makers and nuclear decommissioning stakeholders together in a forum for a discussion on the rulemaking under way on the decommissioning of nuclear power plants. The initial draft rule was published in November 2015 and stakeholder comments were provided back to the USNRC in March 2016. This session will further update the discussions held at the 2016 ANS Winter Session on the progress of Decommissioning Rule making.

Panelists:
Alesia Bone *(NRC)*
Coley Chappel and William Zipp *(Utility and Merchant Power Plant Reps)*
Gerry Vanoordennen *(D and D Industry Service Practitioner (ES))*
Rod Mccullum *(NEI)*
Thomas Magette *(D and D Industry Advisor)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Research by U.S. DOE NEUP-Sponsored Students—I

Sponsored by: ETWDD
Session Organizer: Cheresa Novich *(INL)*
Chair: Andrew E. Thomas *(INL)*
Location: Hoover **Time:** 8:00-11:15 am

8:05 am: Turbulence Measurements in Pipe Flow via Positron Emission Particle Tracking, Cody Wiggins, Nitant P. Patel, Arthur Ruggles *(Univ Tenn., Knoxville)*

8:30 am: Effect of Upper Head Leak on the Onset of Natural Convection in HTGRs, Daniel Gould, Hitesh Bindra *(Kansas State)*

8:55 am: New Plenum Design for Reactor Cavity Cooling System Experimental Apparatus, David Holler, Rodolfo Vaghetto, Yassin Hassan *(Texas A&M)*

9:35 am: Vacuum Drying Experiments Using a Mock Used Fuel Assembly, Matthew Shalloo, Travis W. Knight, Jamil Khan, Tanvir Farouk *(Univ South Carolina)*, James Tulenko *(Univ Florida)*

10:00 am: Neutronics Simulations of the RPI Walthousen Reactor Critical Facility (RCF) Using Proteus-SN, Matthew D. Eklund, Mathieu Dupont, Peter F. Caracappa, Wei Ji *(RPI)*

10:25 am: Depleted Uranium and Th-232 Decay Chain Daughter Isotope Identification with 4H-SiC Alpha Spectroscopy, Josh Jarrell, Milan Stika, Michael Simpson, Thomas E. Blue, Lei R. Cao *(Ohio State)*

10:50 am: Uncertainty Quantification for Steady-State PSBT Benchmark Using Surrogate Models, Katarzyna Borowiec, Chen Wang, Tomasz Kozlowski, Caleb S. Brooks *(Univ Illinois)*

Technical Approach for Defense in Depth for Advanced Reactors–Panel

Sponsored by: NISD
Session Organizer: Thomas Sowinski *(DOE)*
Chair: Diana Li *(DOE)*
Location: Coolidge **Time:** 8:00-11:40 am

Welcome and Logistics

Opening Remarks and Objectives of Panel

Panel Session–I:

Defense in depth paper for submission to NRC this year, current regulatory requirements, related actions, Jim Kinsey *(INL)*

Advanced reactor design criteria: HTGR, MSR, SFR, George Flanagan *(ORNL)*

Source term for SFR, Matthew Bucknor *(ANL)*

Panel Session–II:

Industry Perspectives: Overview of specific reactor design, intended exclusion zone/footprint, expected source term, approach to defense in depth, challenges, and plans to address challenges for defense in depth.

Panelists:
Eric Harvey *(EPRI)*
Derek Bass *(General Electric)*
Martin Van Staden *(X-Energy)*
Michael Laufer *(Kairos Power)*
Brian Johnson *(TerraPower)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

U.S. and UK International Collaboration on Nuclear R&D—I–Panel

Sponsored by: RPD **Cosponsored by:** FCWMD
Session Organizer and Chair: Andrew Worrall *(ORNL)*
Location: Harding **Time:** 8:00-9:20 am

Although the United States and United Kingdom currently operate different fuel cycles that support differing reactor technologies, both countries have recently evaluated similar fuel cycle options and are currently working toward a collaborative government-to-government agreement on nuclear energy. The objective of this session is to highlight the current key research topics being addressed in the two countries, including existing collaborations, to present a clearer understanding of nuclear energy policy, to identify international research priorities, and to highlight the technical challenges for future fuels, reactors, and fuel cycles. The session will be split into two parts: the first will be a panel session in which U.S. and U.K. government representatives will set the scene in each country by highlighting the current nuclear landscape, current developments and needs in key research topics, and the benefits of the collaboration; the second part will be a series of technical talks that reflect a number of the current and recent collaboration activities. Topics will include advanced fuels, advanced fuel cycles, fuel cycle scenarios, and modeling and simulation.

Panelists:
Andrew Worrall *(DOE)*
Sarah Lennon *(DOE)*
Fiona Rayment OBE *(Dept. for Business, Energy and Industrial Strategy, UK)*
John Kelly *(DOE)*
Andrew Sherry *(UK National Nuclear Lab)*

U.S. and U.K. International Collaboration on Nuclear R&D—II

Sponsored by: RPD
Session Organizer and Chair: Andrew Worrall *(ORNL)*
Location: Harding **Time:** 9:35 am-12:05 pm

9:35 am: U.S. and U.K. International Collaboration on Nuclear R&D–Nuclear Fuels and Materials, Jon Carmack *(INL)*, Daniel Mathers *(UK NNL)*

10:00 am: A NEUP Example of US-UK Collaboration: An Experimental and Analytical Investigation into Critical Heat Flux Implications for Accident Tolerant Fuel Concepts, Youho Lee, Edward Blandford *(Univ New Mexico)*, Nicholas Brown *(Penn State)*, Amir F. Ali, Maolong Liu *(Univ New Mexico)*, Wade Marcum, Daniel LaBrier *(Oregon State)*, Simon Walker, Geoffrey Hewitt, Raad Issa *(Imperial College)*, Colby Jensen *(INL)*, John Strumpell *(AREVA)*, Raul Rebak *(General Electric)*

10:25 am: ^{241}Am Production for Use in Radioisotope Power Systems, Tim Tinsley, Mark Sarsfield *(UK NNL)*

10:50 am: A US-UK Collaboration on Fuel Cycle Assessment, Eva Davidson, Joshua Peterson-Droogh, Andrew Worrall *(ORNL)*, Robert Gregg *(UK NNL)*

11:15 am: Coordination of Plutonium Separations, R. M. Wham, D. W. DePaoli, D. Benker, L. H. Delmau *(ORNL)*

11:40 am: The UK National Programme R&D on Digital Nuclear Reactor Design, Bruno Merk *(Univ Liverpool)*, Mark Bankhead *(UK NNL)*, Lynn Dwyer *(Univ Liverpool)*, Andy Bowen *(Amec Foster Wheeler)*

TUESDAY, OCTOBER 31

POSTER SESSIONS – 11:00 AM

Student Poster Session in Technology Expo

Location: Exhibit Hall A **Time:** 11:00 am-1:00 pm

Accelerator Applications

1. Elements of Fast Region Cross Section Evaluations, Amanda Lewis *(University of California, Berkeley)*, Devin Barry, David Brown

Aerospace Nuclear Science and Technology

2. Pulsed Electrothermal Convergent Thruster Technology, Daniel A. Arizaga *(University of Florida)*, Dhaval Patel, Leigh Winfrey
3. Design of a Nuclear Thermal Rocket with Low-Enriched Cermet Fuel Using Coupled Monte Carlo-Thermal Hydraulic Analysis, Jonathan T. Gates *(Georgia Institute of Technology)*, Andrew Denig, Rahat Ahmed, Joseph Elkins, Vedant Mehta, Dan Kotlyar

Biology and Medicine

4. Mapping the Distribution of Boron-Neutron Capture Utilizing A SPECT Detection System, Jacqueline K. Garcia *(University of California, Berkeley)*, Yaroslav Kaminskiy
5. Validation of a Geant4 Application for Tomography Simulation (GATE) Model of a Positron Emission Tomography (PET) Scanner for Multi-Positron Emission Particle Tracking (M-PEPT), Roque Antonio Santos Torres *(University of Tennessee, Knoxville)*, Cody Wiggins, Mathew Herald, Nitant Patel, Arthur Ruggles
6. Lanthanide Vanadate Nanoparticles as Carriers of ^{225}Ac for Targeted Alpha Therapy, Miguel Toro Gonzalez *(Virginia Commonwealth University)*, Dr. Jessika Rojas

Education, Training, and Workforce Development

7. Please Don't Cut Our Funding! A Pipeline to Public Service, Hannah E. Gardiner *(University of Florida),* James E. Baciak

Fuel Cycle and Waste Management

8. High Energy Neutron Imaging of Dry Cask Storage, Christopher R. Greulich *(University of Florida)*, James Baciak
9. Fundamental Characterization of Uranium Morphology in LiCl-KCl Eutectic Salt, Dimitris Killinger *(Virginia Commonwealth University)*, Michael Woods, Adam Baggett, Supathorn Phongikaroon
10. Electrochemistry of $CeCl_3$-LiCl-KCl on a Liquid Bismuth Cathode, Michael Woods *(Virginia Commonwealth University)*

Fusion Energy

11. Effects of Plasma Gases on Electrothermal Launcher Technology, Dhaval Patel *(University of Florida)*, Daniel Arizaga, Leigh Winfrey

Human Factors, Instrumentation, and Controls

12. Varying Signal Duration and Advanced Signal Processing for Thick Concrete Specimens, Dan C. Floyd *(University of Tennessee, Knoxville)*, N. Dianne Bull Ezell, Hector Santos-Villalobos, Dwight Clayton

Isotopes and Radiation

13. Au@TiO_2 Nanomaterials Fabricated Through X-Rays and Their Radiosensitizing Effect on Methylene Blue Degradation, Maria C. Molina Higgins *(Virginia Commonwealth University)*, Jessika Rojas Marin

Materials Science and Technology

14. Characterization of Carbon Nanotube Composite Film Using Photothermal Measurement Technique, Kurt Harris *(Utah State University)*, Heng Ban
15. The Effect of High Pressure Torsion on Structural and Mechanical Properties of a Ferritic-Martensitic Grade 91 Steel, Malwina Wilding *(Idaho State University)*, Ishtiaque Robin, Andrew Hoffman, Haiming Wen

Nuclear Criticality Safety

16. Monte-Carlo Simulation Studies on Criticality Safety Assessments of Transuranic Elements Storage in the Pyroprocess Facility, Jinhwan Kim *(Korea Advanced Institute of Science & Technology)*, Kyeongjin Park, Gyuseong Cho
17. Design of an Intermediate Energy Critical Experiment to Validate Nuclear Data and Computational Methods in the Unresolved Resonance Region, Miriam Rathbun *(Massachusetts Institute of Technology)*, Rian Bahran, Jesson Hutchinson, Theresa Cutler
18. Critical Benchmark Designs for Validating Polyethylene and Lucite Thermal Neutron Scattering Cross Sections, Tera Sparks *(Georgia Institute of Technology)*, C. Percher, D. Heinrichs

Nuclear Nonproliferation

19. Development of Advanced Gas-Phase Separations Apparatus for Organometallic Fission Products, Colton J. Oldham *(University of Tennessee, Knoxville)*

Radiation Protection and Shielding

20. The Generalized Spallation Model, Chase Juneau *(Idaho State University)*, Leslie M. Kerby
21. Uncertainty Budgets Associated with Calibration, Melissa Moreno *(University of New Mexico)*
22. Evaluation of Epoxy-Based Nanocomposites for Radiation Shielding, Nicholus A. Radcliffe (*Virginia Commonwealth University)*, Jessika V. Rojas Marin, Ph.D.
23. Atmospheric ^{41}Ar Plume Tracking and Model Development of the UF Training Reactor Using a Large-Volume NaI Detector, Gabriel Sandler *(University of Florida)*, Hannah E. Gardiner, Jesse Bruner, James E. Baciak

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31
POSTER SESSIONS – 11:00 AM

Student Poster Session in Technology Expo Continued
Location: Exhibit Hall A **Time:** 11:00 am-1:00 pm

Reactor Physics

24. Comparison of Multi Energy Group Neutron Cross Section versus ENDF7 Cross Section, Bilguun Byambadorj *(Idaho State University)*

25. An Intro to Moltres, an MSR Multiphysics Code, Gavin Ridley *(University of Tennessee)*, Dr. Alexander Lindsay, Dr. Kathryn Huff

26. Design of an Accident Tolerant Fuel Made Using Direct Manufacturing, Briana Hiscox *(Massachusetts Institute of Technology)*, Koroush Shirvan

Thermal Hydraulics

27. Scaled Experiment Investigating Sonomechanically Enhanced Inert Gas Sparging Mass Transfer, Gemma Irais Strong (*University of New Mexico)*, Floren Rubio, Edward Blandford

28. Lagrangian Flow Measurement in Opaque Engineering Systems, Nitant P. Patel *(University of Tennessee, Knoxville)*, Seth Langford, Cody Wiggins, Matthew Buttery, Roque Santos, Zach Bingham, Dr. Arthur Ruggles

29. Design, Fabrication, and Construction of High-Temperature Fluoride Salt Test Facilities for FHR Applications, Minghui Chen *(University of Michigan)*, Sheng Zhang, Xiaodong Sun, Richard Christensen, Graydon Yoder

30. Comparative Analysis of RANS Turbulence Models for the Pavia TRIGA Mark II Reactor, Carolina Introini *(Politecnico di Milano)*, Tommaso Barani, Antonio Cammi, Stefano Lorenzi, Davide Baroli, Bernhard Peters, Davide Chiesa, Massimiliano Nastasi, Ezio Previtali

Co-op or Internship Experience and Results

31. In-Pile Fission Chamber R&D: A Collaborative Internship between the French Alternative Energies and Atomic Energy Commission *(CEA)* and Idaho National Laboratory *(INL)*, Sarah Stevenson *(Kansas State University)*

TECHNICAL SESSIONS – 1:00 PM
All afternoon sessions feature a coffee break at 2:45 pm

The Need for Hot Cells for Nuclear R&D–Panel
Sponsored by: FCWMD
Session Organizer and Chair: Stephen Napier *(National Nuclear Lab)*
Location: Delaware A **Time:** 1:00-4:15 pm

As research into advances in nuclear technology and engineering continues to underpin current and future requirements, there is a need to ensure that the relevant infrastructure and capabilities to operate that infrastructure are in place to support this. In particular, Hot cells are required to carry out research and development in areas like used fuel, cleanup, and repository programs. This panel is made up of national and international experts from industry and national laboratories and explores why we need the facilities, the current and future status, and the key challenges we face. Experts will come from France, the United Kingdom, and the United States, and the panel will consist of a presentation followed by a discussion and Q&A session.

Panelists:
Rory Kennedy *(INL)*
Bruce Bevard *(ORNL)*
Rod McCullum *(NEI)*
Keith Waldrop *(EPRI)*
Jean Noirot *(CEA)*
Sumit Ray *(Westinghouse)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Recent Nuclear Criticality Safety Program Technical Accomplishments

Sponsored by: NCSD
Session Organizer: Lori Scott *(NCSP)*
Chair: Douglas G. Bowen *(ORNL)*
Location: Delaware B **Time:** 1:00-4:15 pm

1:05 pm: Kilowatt Reactor Using Stirling TechnologY (KRUSTY) Experiment Update, Rene Sanchez, David Hayes *(LANL)*

1:30 pm: Flat-Top Startup at the National Criticality Experiments Research Center, David K. Hayes *(LANL)*

1:55 pm: Measurements on a Subcritical Copper-Reflected α-Phase Plutonium (SCRαP) Sphere, J. Hutchinson, R. Bahran, T. Cutler *(LANL)*, W. Monange *(IRSN)*, J. Arthur, M. Smith-Nelson *(LANL)*, E. Dumonteil *(IRSN)*

2:20 pm: ORNL Neutron Cross-Section Measurements in the Resolved Resonance Range for the NCSP, K. H. Guber *(ORNL)*

3:00 pm: A Novel Methodology for Generating Thermal Scattering Cross Sections and Uncertainties, Chris W. Chapman, Farzad Rahnema *(Georgia Tech)*, Luiz Leal *(IRSN),* Yaron Danon *(RPI)*, Goran Arbanas *(ORNL)*

3:25 pm: FY 2016 Progress in Resonance Evaluations of Gadolinium for the NCSP, Vladimir Sobes, Klaus Guber *(ORNL)*, Luiz Leal *(IRSN)*

3:50 pm: DOE Nuclear Criticality Safety Program Website Modernization, Dave Heinrichs, Chuck Lee, Stacy Peterson *(LLNL)*

Nuclear Fuels and Materials in Fast Reactors

Sponsored by: MSTD
Session Organizer and Chair: Kenneth J. Geelhood *(PNNL)*
Location: Virginia A **Time:** 1:00-3:25 pm

1:05 pm: Thermodynamic Modeling of Lanthanide-Cladding-Additive Systems: Assessment of the Ce-Fe-Sb System, Yi Xie, Jinsuo Zhang *(Virginia Tech)*

1:30 pm: Assessment of Creep-Fatigue Behavior of Alloy 709, Ty Porter, Kip Findley *(Colorado School of Mines)*, Michael McMurtrey *(INL)*

1:55 pm: Development of a Thermal Conductivity Model for the Irradiated U-Pu-Zr Metallic Fuels, A. Karahan *(ANL)*

2:20 pm: Serrated Flow in Alloy 709 (Fe-25Ni-20Cr), A. S. Alomari, N. Kumar, K. L. Murty *(NCSU)*

3:00 pm: Fuel Assembly Distortion in Fast Reactor Environment, Julie Dewberry *(Washington State Univ)*, James J. Grudzinski *(ANL)*, Ronald P. Omberg *(PNNL)*

Export Controls–Panel

Sponsored by: NNPD
Session Organizer: Steve Eugene Skutnik *(Univ Tenn., Knoxville)*
Chair: Margaret E. Harding *(4 Factor Consulting, LLC)*
Location: Virginia B **Time:** 1:00-2:45 pm

Given the global nature of the nuclear enterprise, export controls represent a first line of defense for preventing illicit trade in nuclear technology. Yet compliance with export controls affects far more than just commercial industry, touching on numerous activities conducted by both the national laboratories and academia. This panel brings together experts from industry, national laboratories, and academia to offer their perspectives on the challenge in implementing export controls within their respective domains, with the goal of stimulating a lively discussion of current challenges and issues faced beyond just the commercial realm.

Panelists:
Allen DiPalma *(Univ Pittsburgh)*
Gretchen Hund *(PNNL)*
Katie Strangis *(DOE/NNSA)*
Kevin Cuddy *(GE)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Fuel Cycle Analysis

Sponsored by: FCWMD
Session Organizer: Kathryn D. Huff *(Univ Illinois)*
Chair: Jared A. Johnson *(ORNL)*
Location: Virginia B **Time:** 3:05-4:40 pm

3:05 pm: Fuel Cycle Analysis for Modified High Conversion LWR Assembly, Naiki Kaffezakis, Dan Kotlyar (Georgia Tech)

3:30 pm: Synergistic Spent Nuclear Fuel Dynamics Within the European Union, Jin Whan Bae, Kathryn Huff, Clifford Singer *(Univ Illinois)*

3:55 pm: Applying Preliminary Hazard Analysis and Analytic Hierarchy Process to a Nuclear Renewable Hybrid Energy System, Emma K. Redfoot, Kelley Verner, R. A. Borrelli *(Univ Idaho)*

4:15 pm: Hazard and Operability Analysis of a Pyroprocessing Facility, Jieun Lee, R. A. Borrelli *(Univ Idaho)*

Perspectives on the ANS Congressional Fellowship–Panel

Sponsored by: YMG
Session Organizer and Chair: Harsh S. Desai *(NEI, Energy Solutions, LLC)*
Location: Virginia C **Time:** 1:00-2:45 pm

The objective of this session is to discuss the ANS Congressional Fellowship experience and the need for public policy engagement on nuclear issues as well as to highlight career development opportunities in public policy. The panel members will discuss their experience working with policy makers and the benefits of fellowship experience on their current and future endeavors.

Panelists:
Levi Patterson *(US Senator Coons)*-2017 & Current Congressional Fellow
Chad J. Boyer *(Westinghouse)*-2012 ANS Congressional Fellow
Harsh S. Desai *(NEI, Energy Solutions, LLC)*-2014 ANS Congressional Fellow
Jeremy Pearson-2015 ANS Congressional Fellow
Benjamin Reinke *(US Senate)*-2016 ANS Congressional Fellow
Craig H. Piercy *(ANS Washington Representative)*

Potent Policies: Understanding ANS Position Papers–Panel

Sponsored by: YMG
Session Organizer: Nicholas William Thompson *(LANL)*
Chair: Daniel Curtis *(MIT)*
Location: Virginia C **Time:** 3:05-4:15 pm

The Public Policy Committee (PPC) facilitates and develops statements of the American Nuclear Society's position on public issues involving various aspects of nuclear science and technology. This panel will offer ANS members an opportunity to listen to key members of the PPC discuss their roles, responsibilities, and backgrounds. ANS members will be given the chance to pick the brains of those who craft the position statements of ANS and to discover how they can get involved with the committee.

Panelists:
Craig H. Piercy *(ANS Washington Representative)*
Steve Nesbit *(Duke Energy)*
Leah Parks *(NRC)*
Art Wharton *(Studsvik)*

Deterministic Transport Methods

Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Jonathan A. Walsh *(LLNL)*
Location: Maryland A **Time:** 1:00-3:25 pm

1:05 pm: Approximate Transport Sweeps for DFEM on Higher Order Meshes with Spatially Varying Cross Sections, Sebastian Schunert, Yaqi Wang, Vincent Laboure, Javier Ortensi, Mark DeHart *(INL)*

1:30 pm: Alternate LD Closures to Ensure Cell-Averaged Positivity on Unstructured Meshes, Michael W. Hackemack, Troy L. Becker *(Naval Nuclear Lab)*

1:55 pm: Meshless Local Petrov-Galerkin Solution of the Neutron Transport Equation in Nonhomogeneous Media, Brody R. Bassett, Brian C. Kiedrowski *(Univ Michigan)*

2:20 pm: Application of Truncated Karhunen-Loève Transform Basis Sets in the 1-D Discrete Generalized Multigroup Method, Richard Reed, Jeremy A. Roberts *(Kansas State)*

3:00 pm: Hexagonal CMFD Accelerated Discrete Nodal Transport Method in Triangular-Z Geometry, Zhitao Xu, Hongchun Wu, Youqi Zheng *(Xi'an Jiaotong Univ)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Human Factors, Instrumentation, and Controls: General—I

Sponsored by: HFICD
Session Organizer: Kathryn Ann McCarthy *(Canadian Nuclear Labs)*
Chair: Jamie Coble *(Univ Tennessee)*
Location: Maryland C **Time:** 1:00-4:15 pm

1:05 pm: Simulation-Based Optimization of Communication Protocol for Nuclear Power Plant Outages, Zhe Sun, Pingbo Tang *(Arizona State)*

1:30 pm: Concealed Operation Validation System to Prevent the Human Errors in Nuclear Power Plants, Jeeyea Ahn, Seung Jun Lee *(Ulsan National Inst. Sci. Technol.)*

1:55 pm: Development of Quantitative Resilience Model for Unexpected Situations in NPPs, Ji Tae Kim *(Korea Inst. Nuclear Safety)*, Jooyoung Park *(Chosun Univ)*, Poong Hyun Seong *(KAIST)*, Jonghyun Kim *(Chosun Univ)*

2:20 pm: Development of Complex Decision-Making Algorithm for NPPs: Concepts and Related Works, Seung Geun Kim, Poong Hyun Seong *(KAIST)*

3:00 pm: Selection Methodology of Minimum Inventory for APR1400 MCR Safety Console, Kwang-Rak Seo, Jae Hyuk Park, Hwan Yong Jung *(KEPCO)*

3:25 pm: A Lumped Parameter Model of Heat Flow Through a High Temperature Fission Chamber, Neil R. Taylor, Brandon A. Wilson, Kelly McCary, Thomas E. Blue *(Ohio State)*, Dianne Ezell *(ORNL)*

3:50 pm: Simulation of Teleoperation Aided by Augmented Virtual Fixtures, Young Soo Park *(ANL)*

Reactor Physics Challenges in Molten Salt Reactor Design—I

Sponsored by: RPD
Session Organizer: Massimiliano Fratoni *(Univ California, Berkeley)*
Chair: Manuele Aufiero *(Univ California, Berkeley)*
Location: Maryland B **Time:** 1:00-3:50 pm

1:05 pm: Spectral Shift Operation with Multi-Reloading Scheme Analysis in the SmAHTR Design, Vedant Mehta, Dan Kotlyar *(Georgia Tech)*

1:30 pm: Effects of Fuel Salt Velocity Field on Neutronics Performances in Molten Salt Reactors with Open Flow Channels, Gang Yang *(Purdue Univ)*, Tongkyu Park *(Purdue Univ, FNC Technol.)*, Won Sik Yang *(Purdue Univ)*

1:55 pm: Full-Core Analysis of Thorium-Fueled Molten Salt Breeder Reactor Using the SERPENT 2 Monte Carlo Code, Andrei Rykhlevskii, Alexander Lindsay, Kathryn Huff *(Univ Illinois)*

2:20 pm: Initial Benchmarking of ChemTriton and MPACT MSR Modeling Capabilities, Cole A. Gentry, Benjamin R. Betzler, Benjamin S. Collins *(ORNL)*

3:00 pm: Measurement of the ^{35}Cl(n,p) and ^{35}Cl(n,α) Cross-Sections at the Berkeley High Flux Neutron Generator, J. C. Batchelder, S.-A. Chong, M. A. Unzueta, M. Fratoni, The HFNG Collaboration *(Univ California, Berkeley)*

3:25 pm: Analysis of Operational Anomalies for the Molten-Salt Reactor Experiment, A. M. Wheeler, V. Singh, O. Chvala, B. R. Upadhyaya *(Univ Tenn., Knoxville)*

The GAIN Initiative for Advanced Nuclear Power Plants–Panel

Sponsored by: OPD, **Cosponsored by:** YMG
Session Organizer and Chair: Kenneth Ferguson *(Advanced Nuclear Technology, Global Nuclear Associates)*
Location: Washington 1 **Time:** 1:00-4:15 pm

Both legislative houses of the U.S. Congress have taken recent action in support of new commercial reactor development to be a key element of future power generation. The related GAIN initiative (Gateway for Accelerated Innovation in Nuclear) includes attentions to efficient regulatory actions and key roles for the U.S. Department of Energy, the commercial nuclear sector, as well as universities in enhanced collaboration in development of new reactor alternatives. This panel will discuss and address examples of program and technology status, leveraging, and progress relevant to the GAIN initiative.

Panelists:
Rita Baranwal *(INL)*
Jacob DeWitte *(Oklo, Inc)*
Sandra Di Matteo *(Bentley Systems)*
Michael Baron *(Global Nuclear Associates)*

Technical Sessions: Tuesday October 31

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Thermal Hydraulics for Nuclear Space Applications–Panel

Sponsored by: THD
Session Organizer: Fatih Aydogan *(Idaho State Univ)*
Cochairs: Fatih Aydogan *(Idaho State Univ)*, Michael G. Houts *(NASA/MSFC)*
Location: Washington 2 **Time:** 1:00-4:15 pm

Various nuclear space technologies have been designed in the recent decades. These technologies are mainly designed for rocket propulsion and electric generation. The significant advantage of using these technologies is to generate power for a long period of time without refueling and maintenance of the power generation modules. However, thermal-hydraulic design and analysis of these technologies are challenging because of harsh space conditions. These challenges are mainly design, analysis, computational tool and experimental challenges for nuclear space applications. This panel will discuss various current thermal-hydraulic challenges for the nuclear space applications in detail.

Panelists:
Russel Joyner *(Aerojet Rocketdyne)*
Steve Herring *(CSNR)*
Shannon Bragg-Sitton *(INL)*
Michael Houts *(NASA)*
Fatih Aydogan *(Idaho State Univ)*

Thermal Hydraulics of Advanced Reactors

Sponsored by: THD
Session Organizer: W. David Pointer *(ORNL)*
Cochairs: Hisashi Ninokata *(Politecnico di Milano-ASBA)*, John C. Luxat *(McMaster Univ)*
Location: Washington 3 **Time:** 1:00-3:50 pm

1:05 pm: The Mechanisms Engineering Test Loop (METL): A High-Temperature, Sodium Test Facility, D. W. Kultgen, E. F. Kent, D. Andujar, A. J. Reavis, C. Grandy, and M. G. Hvasta *(ANL)*

1:30 pm: Overview of Shakedown Testing of the High Temperature Test Facility, Kyle E. Brumback, Brian G. Woods, Seth R. Cadell *(Oregon State)*

1:55 pm: Experimental Investigation of Natural Circulation During Air Ingress Scenario in a VHTR, Apoorva V. Rudra, Dinesh V. Kalaga, Narbeh Artoun, Masahiro Kawaji *(City College New York)*

2:20 pm: CFD Air Ingress Analyses on a High Temperature Test Facility, Izabela Gutowska, Seth R. Cadell, Brian G. Woods *(Oregon State)*

3:00 pm: Steady-State and Stability Analysis of Natural Circulation in Gallium Thermal Hydraulic Loop, Brendan Ward, Austin Wiley, Richard McCulloch, Hitesh Bindra *(Kansas State)*

3:25 pm: CFD Analysis of a Molten Salt Natural Circulation Loop with Neutronics Feedback, J. A. Wang, R. J. Sheu, Y. S. Tseng *(Tsing Hua Univ)*

International Decommissioning—I: Fukushima

Sponsored by: DESD
Session Organizer: Yasuo Onishi *(Yasuo Onishi Consulting LLC)*
Chair: James J. Byrne *(Byrne & Assoc)*
Location: Washington 4 **Time:** 1:00-2:45 pm

1:05 pm: Towards Enhancing Fukushima Environmental Resilience, Kaname Miyahara *(JAEA)*

1:30 pm: Current Status and Challenges at Fukushima Daiichi Decontamination and Decommissioning, Takashi Hara *(TEPCO Holdings)*

1:55 pm: R&D Activities at JAEA/CLADS Towered Decommissioning of Fukushima Daiichi NPP, Tadahiro Washiya, Yasuaki Miyamoto *(JAEA)*

2:20 pm: Fukushima Revitalization, Yoshiyuki Ishizaki *(TEPCO Holdings)*

TUESDAY, OCTOBER 31

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Focus on Communications—I: Communicating with Policy Makers–Panel

Sponsored by: ETWDD
Session Organizer and Chair: Mimi H. Limbach *(Potomac Communications)*
Location: Hoover **Time:** 1:00-2:45 pm

Policy decisions at the federal and state levels are vitally important for the nuclear energy industry. Decisions at both levels can determine whether nuclear plants continue operating or shut down, or whether investments are made in advanced technology or not. Consequently, communicating with policy makers clearly and frequently is an important element in 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 includes discussion includes professionals who are skilled and experienced in successfully communicating with policy makers at every level.

Panelists:
Matt Bennett *(Third Way)*
Harsh S. Desai *(NEI, Energy Solutions, LLC)*
Jeanne Lopatto *(Westinghouse Electric)*
Ben Reinke *(U.S. Senate Committee on Energy & Natural Resources)*

Focus on Communications—II: Meet the Media–Panel

Sponsored by: ETWDD
Session Organizer and Chair: Laura Hermann *(Potomac Communications)*
Location: Hoover **Time:** 3:05-4:15 pm

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, digital and social 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:
Amy Harder *(Axios)*
Suzanne Tobias *(Miles O'Brien Productions, LLC)*
Peter Maloney *(Utility Dive)*

NRC Spent Fuel Pool Level 3 PRA Insights–Panel

Sponsored by: NISD
Session Organizer and Chair: Matthew R. Denman *(SNL)*
Location: Coolidge **Time:** 1:00-4:15 pm

This panel will discuss current Level 3 Probabilistic Risk Assessment (PRA) of the Spent Fuel Pool (SFP) at the Nuclear Regulatory Commission (NRC). The panel will discuss perspectives of the current modeling approaches employed by the technical staff at the NRC, mechanistic model developers at Sandia National Laboratories, Industry views of the need for level 3 PRAs, and criticisms of previous NRC SFP modeling efforts.

Panelists:
Brian Wagner *(NRC)*
Larry Humphries *(SNL)*
Roy Linthicum *(PWR Owners Group)*
Frank von Hippel *(Princeton)*
Robert Henry *(Fauske and Assoc)*
Samuel Durbin (*SNL)*

Reactor Analysis Methods—I

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Liangzhi Cao *(XJTU)*
Location: Harding **Time:** 1:00-4:15 pm

1:05 pm: A New Polar Angle Dependent Equivalence Method for 3D Transport Calculations, Guillaume Giudicelli, Kord Smith, Benoit Forget *(MIT)*

1:30 pm: Preventing Xenon Oscillation in Monte Carlo Burnup Calculation with Variable Power History Based on RMC, Wanlin Li, Ganglin Yu, Yaodong Li, Kan Wang *(Tsinghua Univ)*

1:55 pm: Preliminary Research on Parallel Algorithm on TaihuLight Supercomputer, Xin Ye, Ganglin Yu, Kan Wang *(Tsinghua Univ)*

2:20 pm: Efficient Evaluation of Core Simulator Few-Group Cross-Section Uncertainties via PCM, Dongli Huang, Hany S. Abdel-Khalik *(Purdue Univ)*, Ondrej Chvala, Guillermo I. Maldonado *(Univ Tenn., Knoxville)*

3:00 pm: Improving a Multi-Physics Coupling Scheme for the Analysis of Xenon-Induced Power Oscillations, Evans D. Kitcher, Sunil S. Chirayath *(Texas A&M)*

3:25 pm: Method Improvements to Enhance ANC9 Performance, Baocheng Zhang *(Westinghouse)*

3:50 pm: IAEA CRP on HTGR Uncertainties: Quantification of Nuclide Inventory Uncertainties in Depletion Calculations, Pascal Rouxelin *(NCSU)*, Gerhard Strydom *(INL)*, Kostadin Ivanov *(NCSU)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1
TECHNICAL SESSIONS – 8:00 AM
All morning sessions feature a coffee break at 9:20 am

Technical Grand Challenges for Fuel Cycle and Waste Management–Panel
Sponsored by: FCWMD
Session Organizer and Chair: Sven O. Bader *(AREVA)*
Location: Delaware A **Time:** 8:00-11:40 am

ANS has identified a Grand Challenge related to "Closing the Nuclear Fuel Cycle" and this panel will present a discussion that builds on the initial presentation by Andrew Worrall at the ANS Annual Meeting. It will focus on results from the U.S. Department of Energy's Fuel Cycle Options Nuclear Fuel Cycle Evaluation and Screening Study report series (fuelcycleevaluation.inl.gov) and how the "most promising" fuel cycles identified by this work can be advanced forward under the current fiscal environment. The panel will also address what members of ANS can do that will most benefit working through this challenge.

Panelists:
Andrew Worrall *(ORNL)*
Michael Todosow *(BNL)*
Patricia Paviet *(DOE NE)*
Alice Caponiti *(DOE NE)*
Paul Murray *(AREVA)*
Edwin Lyman *(UCS)*

Data, Analysis, and Operations in Nuclear Criticality Safety—I
Sponsored by: NCSD
Session Organizer: Theresa E. Cutler *(LANL)*
Chair: Lawrence J. Berg *(DOE)*
Location: Delaware B **Time:** 8:00-11:40 am

8:05 am: Supercritical Kinetic Analysis of Accumulated Fuel Debris in the Fukushima-Daiichi NPS, Toru Obara, Delgersaikhan Tuya *(Tokyo Inst. Technol.)*

8:30 am: Neptunium Subcritical Observation (NeSO) Integral Benchmark Experiment Design, R. Bahran, T. Cutler, J. Hutchinson *(LANL)*

8:55 am: Modernization at the Y-12 National Security Complex: A Case for Additional Experimental Benchmarks, M. L. Thornbury, C. Juarez *(Y-12 National Security)*, A. W. Krass *(C. S. Engineering, Inc.)*

9:35 am: Using Fast Burst Assembly Designs to Demonstrate Safe Assembly of KRUSTY Core Components, William Myers, Richard Anderson, Mark Mitchell *(LANL)*

10:00 am: Experimental Design to Study Criticality Effects of Plutonium Aging, Theresa Cutler, Travis Grove, Dave Hayes, Mark Mitchell, William Myers, Rene Sanchez, Jessie Walker, Bob Margevicius *(LANL)*

10:25 am: Thermal Scattering Law Comparison of Experimental Ice and Concrete Data, Carl Wendorff, Kemal Ramic, Li Liu, Yaron Danon *(RPI)*

10:50 am: Differential and Integral Data Evaluation for Titanium: An Application to Criticality Safety, Luiz Leal, Sophie Pignet, Nicolas Leclaire, Isabelle Duhamel *(IRSN)*, Gary Harms *(SNL)*

11:15 am: Verification of MCNP6.2 for Nuclear Criticality Safety Applications, Forrest Brown, Michael Rising, Jennifer Alwin *(LANL)*

Post-Irradiation Examination
Sponsored by: MSTD
Session Organizer and Chair: Kenneth J. Geelhood *(PNNL)*
Location: Virginia A **Time:** 8:00-11:15 am

8:05 am: Evolution of Fe-20Cr-25Ni Austenitic Alloys Under Proton Irradiation at 670°C, Tianyi Chen, Lizhen Tan *(ORNL)*, Li He, Beata Tyburska-Püschel, K. Sridharan *(Univ Wiscsonsin, Madison)*

8:30 am: Irradiation Effects on Ti_2AlC Thin Films, Ranran Su, Hongliang Zhang, Liqun Shi *(Fudan Univ)*

8:55 am: Tritium Release and Absorption from Molten Flibe Salt Irradiation, Kieran Dolan, David Carpenter, Lin-wen Hu *(MIT)*

9:35 am: Electron Microprobe Examination of Irradiated Metallic Fuel Containing Rare Earth and Minor Actinide Elements, S. Bremier, P. Pöml, L. Capriotti, J. Himbert, V. V. Rondinella *(European Commission)*, H. Ohta, T. Ogata *(Central Research Inst. Electric Power Industry)*

10:00 am: Postirradiation Examination on EBR-II Legacy Metallic Fuel with Minor Actinides, Luca Capriotti, Jason M. Harp, Steven L. Hayes, William J. Carmack *(INL)*

10:25 am: Current Status of Postirradiation Examination of the AFC-3 and AFC-4 Irradiation Tests, Jason M. Harp, Luca Capriotti, Steven L. Hayes, William J. Carmack *(INL)*

10:50 am: Development of a Gamma Emission Tomography System for High-Throughput Burn Up Assessment of Spent Nuclear Fuel Assemblies, Kirk D. Atkinson *(Defense Academy U.K)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Best of Paper Session from ANTPC

Sponsored by: NNPD **Cosponsored by:** IRD
Session Organizer: Shaheen Azim Dewji *(ORNL)*
Chair: Rian M. Bahran *(LANL)*
Location: Virginia B **Time:** 8:00-11:40 am

8:05 am: Alternate Nuclear Proliferation Pathways in the Age of Non-State Actors, James E. Bevins, Bethany L. Goldblum, Elie Katzenson, James Kendrick, Rebecca Krentz-Wee, Sarah Laderman, Yubing Tian *(Univ California, Berkeley)*

8:30 am: Warhead Verification with Transmission Nuclear Resonance Fluorescence, Areg Danagoulian, Jayson R. Vavrek, Brian S. Henderson, R. Scott Kemp, Ruaridh Macdonald *(MIT)*

8:55 am: Nuclear Data Uncertainty Quantification for Nuclear Security Applications, Ian Gauld, Stephen Croft, Marco Pigni, Andrew Nicholson, Mark Williams *(ORNL)*, Vladimir Mozin, Caleb Mattoon, Ramona Vogt *(LLNL)*, Martyn Swinhoe *(LANL)*

9:35 am: The Iran Procurement Channel–Is the Experiment Going to Work?, J. Christian Kessler *(NorthRaven Consulting)*

10:00 am: Some Spatial Limitations in Retrospective Dosimetry with Bricks When Sample Size is Large, Robert B. Hayes, Ryan O'Mara *(NCSU)*

10:25 am: Assessing Impact of Monoenergetic Photon Sources on Nonproliferation Applications, Cameron A. Miller *(Univ Michigan)*, Bernhard Ludewigt, Brian J. Quiter *(LBNL)*, Sara Pozzi *(Univ Michigan)*, Cameron G. R. Geddes *(LBNL)*

10:50 am: Fixed Plant Analysis of Iran's Post-JCPOA Implementation Breakout Potential, Benjamin R. Thomas, Houston G. Wood *(Univ Virginia)*

11:15 am: Detecting Misuse of Aqueous Reprocessing Systems with the Multi-Isotope Process Monitor: Automated Detection of Process Changes, Jamie Coble, Nathan Shoman *(Univ Tenn., Knoxville)*, Dave Meier *(PNNL)*

The Importance of ANS Standards–Panel

Sponsored by: YMG
Session Organizer and Chair: Timothy M. Crook *(Transatomic Power Corp.)*
Location: Virginia C **Time:** 8:00-9:20 am

The standards created and maintained by the professional members of the American Nuclear Society set the bar both domestically and abroad for nuclear design, performance, testing, and calculation methodologies. Standards are essential to ensure that the characteristics and performance of products are consistent, that people use the same definitions and terms, and that products are tested the same way. The ANS standards cover a broad range of subjects and involve collaboration across the sciences, often involving other professional societies. Panelists will share personal experiences on why standards matter as well as how to get involved in the standards creation, approval, and maintenance processes.

Panelists:
George Flanagan *(ORNL)*
Leah Spradley-Parks *(NRC)*
Kelsey Amundson *(DNFSB)*

Nuclear's Role in Climate Change–Panel

Sponsored by: YMG
Session Organizer: Louis J. Chapdelaine *(Univ Wisconsin, Madison)*
Chair: Catherine Perego *(Westinghouse)*
Location: Virginia C **Time:** 9:40-11:40 am

Climate change continues to be a critical issue for the nation even in the wake of the U.S. exit from the Paris Agreement. Nuclear energy offers several attributes that make it an essential part of any plan to decarbonize the energy sector and combat climate change. In this session, panelists will discuss the state of U.S. climate goals and nuclear energy's role in meeting these goals, as well as current actions taking place to inform the public and policymakers about nuclear energy's importance with regards to climate change.

Panelists:
John Kotek *(NEI)*
Rachel Pritzker *(Third Way)*
Eric Meyer *(Generation Atomic)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Computational Methods

Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Thomas M. Sutton *(KAPL)*
Location: Maryland A **Time:** 8:00-10:50 am

8:05 am: Computational Challenges for Transport Codes on Many-Core Architectures, Randal S. Baker, R. Joseph Zerr *(LANL)*

8:30 am: Modeling Parallel and Cellwise Block-Jacobi Iterative Transport Methods with the Performance Prediction Toolkit, Massimiliano Rosa, Stephan J. Eidenbenz, R. Joseph Zerr *(LANL)*

8:55 am: Automated Decomposition of a Structured Grid, Andrew Fitzgerald, Zackary Dodson, Shane Stimpson, Brendan Kochunas *(Univ Michigan)*

9:35 am: MultiApp Transfers in the MOOSE Framework Based on Functional Expansions, Brycen Wendt *(Idaho State)*, Leslie Kerby *(Idaho State, INL)*

10:00 am: A Mesh Mapping Method for MCNP and FLUENT Coupling Simulation, Xinan Wang, Dalin Zhang, Mingjun Wang, Wenxi Tian, Suizheng Qiu, Guanghui Su *(Xi'an Jiaotong Univ)*

10:25 am: Multi-Level Coarse Mesh Finite Difference Method for Solving Three Dimension Neutron Diffusion Equation, Chen Hao *(Univ Michigan, Harbin Engineering Univ)*, Yunlin Xu *(Univ Michigan, ANL)*, Thomas J. Downar *(Univ Michigan)*

Human Factors, Instrumentation, and Controls: General—II

Sponsored by: HFICD
Session Organizer: Kathryn Ann McCarthy *(Canadian Nuclear Labs)*
Cochairs: Edward L. Quinn *(Technology Resources)*, Dan Cole *(Pitt)*
Location: Maryland C **Time:** 8:00-10:50 am

8:05 am: Kernel PCA Based Feature Reduction for NPP Initiating Event Identification, T. H. Lin, S. C. Wu, H. P. Chou *(National Tsing Hua Univ)*

8:30 am: Design Frame of Safety Display System in Nuclear Power Plant, Koheun Kim, JiHyeon Kim, YongChul Shin, JaeHee Yun *(KEPCO-E&C)*

8:55 am: Suggestion of a Conceptual Operator-Oriented Accident Management Support Tool, Seongkeun Kang, Poong Hyun Seong *(KAIST)*

9:35 am: Hanbit 3&4 ILS Upgrade Using the HFC-6000 TMR System, Jorge Narvaez, Jongmin Kim, Allen Hsu *(Doosan HF Controls)*

10:00 am: Autonomous Control for Safety Systems of Nuclear Power Plant by Using the LSTM Neural Network, Daeil Lee, Jonghyun Kim, Jaemin Yang, Sungheon Lee, Gangmin Kim *(Chosun Univ)*

10:25 am: Simulation-Based Testing for Instrumentation and Control Systems, Ozgur Ozmen, James J. Nutaro, Sacit M. Cetiner, Michael D. Muhlheim *(ORNL)*

Computational Tools for Radiation Protection and Shielding

Sponsored by: RPSD
Session Organizer: Irina I. Popova *(ORNL)*
Chair: Avneet Sood *(LANL)*
Location: Maryland B **Time:** 8:00-11:15 am

8:05 am: OLTARIS Ray Distributions and Their Effect on Phantom Mass and Whole Body Effective Dose Equivalent Using a Simple Spherical Shielding Geometry During Transport Outside Earth's Lower Orbit, D. K. Bond, S. Bilbao y León *(Virginia Commonwealth Univ)*, R. C. Singleterry *(NASA)*

8:30 am: Toward On-the-Fly Dose Analysis Using the Shift Monte Carlo Code, Gregory G. Davidson, Kaushik Banerjee *(ORNL)*

8:55 am: Development of the Generalized Spallation Model, Chase M. Juneau, Leslie M. Kerby *(Idaho State)*

9:35 am: General Approach to Combining Pulse Shape Discrimination Algorithms, Surafel Woldegiorgis, Zhu Ting *(Univ Florida)*, Henok Yemam *(Colorado School of Mines)*, James Baciak, Andreas Enqvist *(Univ Florida)*

10:00 am: Material Aging in MCNP6, J. R. Tutt, G. W. McKinney *(LANL)*

10:25 am: Omnibus: A New Front End to Denovo and Shift, Seth R. Johnson *(ORNL)*

10:50 am: Using Simple 1-D Geometries and Response Functions to Model Complex Small Solid Angle Neutron Transport in Air, M. L. Fensin, K. C. Kelley, S. S. McCready *(LANL)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Advanced/Gen-IV Reactors—I

Sponsored by: OPD **Cosponsored by:** YMG
Session Organizer: Piyush Sabharwall *(INL)*
Chair: Vivek P. Utgikar *(Univ Idaho)*
Location: Washington 1 **Time:** 8:00-9:20 am

8:05 am: Near-Term Gas-Cooled Fast Reactor Development, Hangbok Choi, Ryan Hon, Robert W. Schleicher *(General Atomics)*

8:30 am: In-Core Feature Identification Using Neutron, Gamma, and Temperature Data, P. Tsvetkov, C. Rosaire IV, J. Scherr, J. Hearne, G. Marcantel *(Texas A&M)*

8:55 am: Mixed-Integer Multi-Objective Optimization Applied to the PCS Design of the I²S-LWR, Paul R. Wilding, Matthew J. Memmott *(Brigham Young Univ)*

Advanced/Gen-IV Reactors—II

Sponsored by: OPD **Cosponsored by:** YMG
Session Organizer: Piyush Sabharwall *(INL)*
Chair: Vivek P. Utgikar *(Univ Idaho)*
Location: Washington 1 **Time:** 9:35-11:15 am

9:35 am: Future Innovations for Fluoride-Salt-Cooled High-Temperature Reactors (FHRs), C. W. Forsberg *(MIT)*

10:00 am: Feasibility of Burning Wave Reactor with Continuous Fuel Movement, Kazuki Kuwagaki, Jun Nishiyama, Toru Obara *(Tokyo Inst.Technol.)*

10:25 am: Current Status of Experimental Development of MSR and FHR Technologies, Jan Uhlíř, Martin Mareček (Research Centre Řež), Vlastimil Juřiček, Martin Straka, Lorant Szatmáry *(Nuclear Research Inst.)*

10:50 am: Enhancing Electric Grid and Critical Infrastructure Resilience with Resilient Nuclear Power Plants (rNPPs), Sherrell R. Greene *(Advanced Technology Insights, LLC)*

Computational Thermal Hydraulics—I: Computational Fluid Dynamics

Sponsored by: THD
Session Organizer: Maria N. Avramova *(NCSU)*
Cochairs: Igor A. Bolotnov *(NCSU)*, Lane B. Carasik *(Texas A&M Univ)*
Location: Washington 2 **Time:** 8:00-11:40 am

8:05 am: A New Wall Lubrication Force for CFD Simulations of Bubbly Flows, Nazar Lubchenko, Emilio Baglietto *(MIT)*

8:30 am: Verification of the Two-Fluid Model in the Spectral Element Code Nek-2P for Non-Adiabatic Flow Conditions, Dillon R. Shaver *(ANL)*, Ananias Tomboulides *(ANL, Aristotle Univ)*, Aleksandr Obabko, Adrian Tentner, Prasad Vegendla, Elia Merzari *(ANL)*

8:55 am: Two-Phase Flow Regime Transition Study Using the Level-Set Method, Matthew D. Zimmer, Igor A. Bolotnov *(NCSU)*

9:35 am: Computational Study of Turbulent Flow Interaction Between Twin Rectangular Jets, Han Li, N. K. Anand, Yassin A. Hassan *(Texas A&M)*

10:00 am: CFD Modeling of Filmwise Condensation Considering Condensing Wall Boundary Conditions, Dhongik S. Yoon, HangJin Jo, Michael L. Corradini *(Univ Wisconsin, Madison)*

10:25 am: Double-Wall Twisted-Tube Heat Exchanger Simulation and Validation, Bryan Wallace, Amir Ali, Joel Hughes, Ed Blandford *(Univ New Mexico)*

10:50 am: High Efficient Distributed Parallel CFD Analysis for PWR Core, Guangliang Chen, Zhijian Zhang, Zhaofei Tian, Thompson Appah, Lei Li, Peizheng Hu *(Harbin Engineering Univ)*

11:15 am: Multiple RANS Scheme Numerical Simulation on Reactor Pressure Vessel, Peizheng Hu, Zhaofei Tian, Guangliang Chen *(Harbin Engineering Univ)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Experimental Thermal Hydraulics—I: Focus on Advanced Instrumentation

Sponsored by: THD
Session Organizer: Rodolfo Vaghetto *(Texas A&M)*
Cochairs: Rodolfo Vaghetto *(Texas A&M)*, Xiaodong Sun *(Univ Michigan)*
Location: Washington 3 **Time:** 8:00-11:15 am

8:05 am: Development of TDLAS for Water Vapor Concentration Measurement During HTGR Steam Ingress, Michael C. Button, Philippe M. Bardet *(George Washington Univ)*

8:30 am: Comparison of Three Particle Based Velocimetry Techniques, Z. Wang, D. Wang, Y. Liu *(Virginia Tech.)*

8:55 am: Spatial and Temporal Evolution of a Buoyant Jet in a Linearly Stratified Environment, Simon Clément, Robert Forcha, Philippe M. Bardet *(George Washington Univ)*

9:35 am: Pressure Drop Measurements in a Versatile Experimental Facility of Packed Spheres, S. King, E. Kappes, M. Marciniak, D. T. Nguyen, Y. A. Hassan, V. Ugaz *(Texas A&M)*

10:00 am: Feasibility Test of Three-Electrode Conductance Sensor for Measuring Liquid Film Thickness with Two-Phase Liquid Film Flow Experiment, Chi-Jin Choi, Goon-Cherl Park, Hyoung-Kyu Cho *(Seoul National Univ)*

10:25 am: Effect of Liquid Velocity on FAC Under Two-Phase Flow, Masaaki Satake, Kimitoshi Yoneda, Fumio Inada *(Central Research Inst. Electric Power Industry)*

10:50 am: Plume Progression of a Ruptured Fuel Element in a Representative 5x5 PWR Fuel Assembly, G. D. Latimer, W. R. Marcum *(Oregon State)*, W. F. Jones *(INL)*

International Decommissioning—II: Chernobyl

Sponsored by: DESD
Session Organizer: Yasuo Onishi *(Yasuo Onishi Consulting LLC)*
Chair: James J. Byrne *(Byrne & Assoc)*
Location: Washington 4 **Time:** 8:00-10:25 am

8:05 am: Safety Analysis Chernobyl Shelter, Gunter G. Pretzch *(GRS)*

8:30 am: Radioecological Assessment of Chernobyl New Safe Confinement, Yasuo Onishi *(Yasuo Onishi Consulting, LLC),* Mark. J. Zheleznyak *(Univ Fukushima)*, Oleg. V. Voitsekhovych (*Ukrainian Inst. Hydrometeorology)*

8:55 am: Obtaining New Experimental Data on Aerosol Activity in the Complex "New" Safe Confinement-Object "Shelter" Taking into Account the Change in Its Temperature-Humidity Regime, Viktor Krasnov *(National Academy of Science Ukraine)*

9:35 am: Model of Thermalgasdynamic, Humidity and Radioactive State of the Shelter Object and Destroyed Reactor #4 of the Chernobyl NPP (Calculation and Experimental Approach), Mihail Metel, Pavel Krukovskyi *(Inst. of Eng. Thermophysics)*, Victor Krasnov *(National Academy of Sci. Ukraine)*, Anatolii Polubinskyi *(Inst. of Eng. Thermophysics)*

10:00 am: Model of Thermalgasdynamic, Humidity and Radioactive State of the New Safe Confinement and Shelter Object of Chernobyl NPP (Preliminary Results), Pavel Krukovskyi, Mihail Metel *(Inst. of Eng. Thermophysics)*, Victor Krasnov *(National Academy of Sci. Ukraine)*, Anatolii Polubinskyi *(Inst. of Eng. Thermophysics)*

Research by U.S. DOE NEUP-Sponsored Students—II

Sponsored by: ETWDD
Session Organizer: Cheresa Novich *(INL)*
Chair: Gregory A. Bala *(INL)*
Location: Hoover **Time:** 8:00-11:40 am

8:05 am: Design Strategies for Modern Dynamic Nuclear Reactor Monitoring Systems, Christopher Poresky *(Univ California, Berkeley)*

8:30 am: Design of a Ball-on-Flat Fretting Test Apparatus for Elevated Temperature in Nuclear Applications, Arman Ahmadi, Farshid Sadeghi *(Purdue Univ)*

8:55 am: Corrosion Behavior of Stainless Steel 316H in LiF-NaF-KF (FLiNaK) at High Temperatures, Sheng Zhang, Minghui Chen, Shanbin Shi, Xiaodong Sun *(Univ Michigan)*, Richard Christensen *(Univ Idaho)*

9:35 am: In-Situ Study: Faulted Loop and Void Behavior in Single Beam Bulk Irradiated Fe-21Cr-32Ni Model Alloy, Muhammet Ayanoglu, Arthur T. Motta *(Penn State)*

10:00 am: Effect of Alloy Additives on Fuel Cladding Chemical Interactions in Metallic Fuels, N. Jerred *(Univ Idaho, INL)*, I. Charit, R. Khanal, S. Choudhury *(Univ Idaho)*, M. Benson, R. Mariani *(INL)*

10:25 am: Radiation-Induced Grain Subdivision of U_3Si_2 Irradiated by 300 keV Xe^+ at LWR Temperature, Tiankai Yao, Bowen Gong *(RPI)*, Lingfeng He, Jason Harp *(INL)*, Michael Tonks *(Penn State)*, Jie Lian *(RPI)*

10:50 am: Pre-Irradiation Characterization of 304 Steel Processed by Severe Plastic Deformation Techniques, Andrew Hoffman *(Idaho State)*, Haiming Wen *(Idaho State, INL)*, Ryan Carnahan, Ishtiaque Robin, Malwina Wilding *(INL)*

11:15 am: Establishing a Serpent Model for TREAT Transient Analysis, N. C. Sorrell, A. I. Hawari *(NC State)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Technical Issues with Proposed Revision to NRC Regulatory Guide 1.59, "Design Basis Floods for Nuclear Power Plants"–Panel

Sponsored by: NISD
Session Organizer and Chair: Robert J. Budnitz *(LBNL)*
Location: Coolidge **Time:** 8:00-11:40 am

NRC's Regulatory Guide 1.59 dates back to 1977. A revision, based on both more recent technical developments and an up-to-date regulatory approach to assuring safety against large external hazards, has been under development for a few years. This session, consisting entirely of invited presentations, is intended to explain the technical basis for the proposed revision and to explore the diverse views among both the NRC staff and the community of practitioners on the issues involved. Technical insights from the recent work to revise ANS Standard 2.8, "Probabilistic Evaluation of External Flood Hazards for Nuclear Facilities," will also be discussed.

Panelists:
Joseph Kanney *(NRC)*
Joseph Bellini *(Aterra Solutions)*
John Weglian *(EPRI)*
Christopher Cook *(NRC)*

Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—I

Sponsored by: RPD
Session Organizer: Stefano Monti *(IAEA)*
Chair: Vladimir Kriventsev *(TAEA)*
Location: Harding **Time:** 8:00-10:50 am

8:05 am: SEALER – Objectives of a Commercial LFR Demonstration Unit, Janne Wallenius *(LeadCold Reactors)*, Sara Bortot *(Kungliga Tekniska Högskolan)*

8:30 am: LFR-DEMO Development, Status and Perspectives of ALFRED Reactor, Mariano Tarantino, Pietro Agostini, Alessandro Alemberti, Serena Bassini, Alessandro Del Nevo, Fabio di Fonzo, Michele Frignani, Giacomo Grasso, Francesco Lodi, Paride Meloni, Ivan Di Piazza *(ENEAA)*

8:55 am: Flexibility of the LFR: An Asset for Novel, Affordable LFR-AS-200-Based SMRs, L. Cinotti *(Hydromine Nuclear Energy)*, G. Grasso, P. Agostini *(ENEA)*

9:35 am: ALFRED: A Strategic Vision for LFR Deployment, M. Frignani, A. Alemberti, G. Villabruna, R. Adinolfi *(Ansaldo Nucleare)*, M. Tarantino, G. Grasso, A. Pizzuto *(ENEA)*, I. Turcu, S. Valeca *(ICN)*

10:00 am: Westinghouse's Lead Fast Reactor Program, P. Ferroni, F. Franceschini, J. Chrzanowski, C. Stansbury, A. Harkness, J. Liao, J. Vanderhoff, B. Friedmana, S. Smith, M. Smith, J. Willis, J. Fernandez, M. Sanders, S. Stipanovich, M. Ickes, E. Tatli, D. Utley, G. O'Brian, J. Long, Z. Cullen, P. Filiak, J. Monahan, R. Wright, J. Lyons, D. Murphy, A. Andren, M. Heldesjö, S. Middleburgh, E. Gustavsson, M. Puide *(Westinghouse)*

10:25 am: BREST-OD-300 Reactor Facility: Development Stages and Justification, Yu. G. Dragunov, V. V. Lemekhov, A. V. Moiseyev, V. S. Smirnov, O. A. Yarmolenko, V. P. Vasyukhno, Yu. S. Cherepnin, D. A. Afremov, Yu. V. Lemekhov *(JSC "NIKIET")*

Solutions for Near-Term Deployment of Lead-Cooled Fast Reactor Technology—II–Panel

Sponsored by: RPD
Session Organizer: Massimiliano Fratoni *(Univ California, Berkeley)*
Chair: Vladimir Kriventsev *(TAEA)*
Location: Harding **Time:** 11:00-11:40 am

Lead cooled Fast Reactor is one of the most promising generation IV technologies in particular selected and developed by the Generation IV International Forum but also under consideration in other international contexts. It excels in safety, simplicity, cost-effectiveness and sustainability. There are a number of LFRs under development worldwide, including some small modular concepts. For all of them the selection of suitable structural materials for the cladding and the components of the primary system compatible with the heavy metal coolant still represents a challenge to be addressed through a focused R&D and qualification program. The panel is intended to present the most advanced LFRs for near-medium term deployment, as well as to discuss the main issues which have still to be solved for the full qualification of the structural materials in contact with lead.

Panelists:
Luciano Cinotti *(Hydromine Nuclear Energy)*
Fausto Franceschini *(Westinghouse)*
Alessandro Alemberti *(Ansaldo Nucleare)*
Mariano Tarantino *(ENEA)*
Janne Wallenius *(KTH)*
Vadim Lemekhov *(NIKIET)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1
TECHNICAL SESSIONS – 1:00 PM
All afternoon sessions feature a coffee break at 2:45 pm

Progress in DOE's Nuclear Technology Research and Development Program–Panel
Sponsored by: FCWMD
Session Organizer: Jack D. Law *(INL)*
Chair: Patricia D. Paviet *(DOE)*
Location: Delaware A **Time:** 1:00-4:15 pm

The objective of this session is to disseminate information and stimulate discussion regarding recent research and development (R&D) progress by early to mid-career researchers in the U.S. Department of Energy's (DOE's) Nuclear Technology Research and Development Program. The session will consist of technical presentations provided by researchers in several technical areas of the 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, advanced reactor systems, material protection and control, and modeling/simulation in these areas. The participants will also be recognized by DOE for their contributions to the program.

Panelists:
Amanda Lines *(PNNL)*
Nicholas Stauff *(ANL)*
Darius Lisowski *(ANL)*
Sonat Sen *(INL)*
Luca Capriotti *(INL)*
Sam Durbin *(SNL)*
Daniela Henzlova *(LANL)*

Current Spent Fuel Pool Nuclear Criticality Safety Issues for NRC Licensees–Panel
Sponsored by: NCSD **Cosponsored by:** OPD, YMG
Session Organizer and Chair: Alyse M. Scurlock *(Duke Energy Corp.)*
Location: Delaware B **Time:** 1:00-2:45 pm

NRC licensees face a number of challenges today relating to spent fuel pool nuclear criticality safety. A panel of spent fuel pool nuclear criticality safety subject matters experts from the industry will discuss these challenges. Discussion will include current analysis tools and techniques, the use of neutron absorbers in spent fuel pools, absorber monitoring programs, and other issues.

Panelists:
Hatice Akkurt *(EPRI)*
Bob Hall *(Dominion)*
Kris Cummings *(NEI)*

Membership Challenge Activity Debrief and Solution Discussion–Panel
Sponsored by: NCSD
Session Organizer: Mackenzie L. Gorham *(DOE)*
Cochairs: Mackenzie L. Gorham *(DOE),* John A. Miller *(SNL)*
Location: Delaware B **Time:** 3:05-4:15 pm

The Nuclear Criticality Safety Division (NCSD) hosted a first-of-its kind student and early career competition during the 2017 Winter Meeting. Though the competition ended earlier in the week, NCSD will use this session to present appropriate methods and solutions for the competition design problem and explain the technical background that nuclear criticality safety engineers use to develop similar solutions during real-world professional problem-solving activities. This session will also delve into criticality safety professions, discuss the opportunities for students, young members, and new members to get involved with NCSD, and describe associated ANSI/ANS standards activities that the division leads.

Panelists:
MacKenzie Gorham *(DOE)*
Deborah Hill *(UK National Nuclear Lab)*
John Miller *(SNL)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Nuclear Fuels

Sponsored by: MSTD
Session Organizer: Kenneth J. Geelhood *(PNNL)*
Chair: Kallie E. Metzger *(SRNL)*
Location: Virginia A **Time:** 1:00-4:15 pm

1:05 pm: A Study on Fatigue Charateristics of Zr-Based Spacer Grid Materials, Joongjin Kim, Joonkyoo Park, Kyongbo Eom, Jongsung Yoo *(KEPCO)*

1:30 pm: Research on $ZrSi_2$-SiC/SiC Anti-Oxidation Coating on HTR Graphite Spheres, Zujie Zheng, Ping Zhou, Hongsheng Zhao, Xiaoxue Liu, Bing Liu *(Tsinghua Univ)*

1:55 pm: Development of the PRIME Code for Dispersion Fuel in Research Reactors, Gwan Yoon Jeong *(Ulsan National Inst. Sci. Technol.)*, Dong-Seong Sohn *(ANL)*, Tae Won Cho *(Ulsan National Inst. Sci. Technol.)*, Yong Jin Jeong *(KAERI)*, Dong-Seong Sohn *(Ulsan National Inst. Sci. Technol.)*

2:20 pm: Experimental Investigation of Solid Particles Flow in TRISO Spouted Bed Coaters with Binary Mixtures of Particles Using RPT, Thaar Al-Juwaya, Neven Ali, Muthanna Al-Dahhan *(Missouri Univ Sci. Technol.)*

3:00 pm: Fuel Related Facilities Available at CNL, N. Harrison, R. Ham-Su, M. Saoudi, A. Barry *(CNL)*

3:25 pm: Effects of High Temperature Pre-Strain on Hardness and Creep Behavior of UO_2 Between 25 and 500 °C: A Nanoindentation Study, D. Frazer *(Univ California, Berkeley)*, B. Shaffer, P. Peralta *(Arizona State)*, P. Hosemann *(Univ California, Berkeley)*

3:50 pm: Fluoride Volatility Experiments on Irradiated Thoria Fuel, A. Barry, A. Bergeron, T. Stoddard, B. Crigger, H. Hamilton, A. Maybee *(CNL)*

Progress in Reducing the Threat of HEU Around the World–Panel

Sponsored by: NNPD
Session Organizer and Chair: John N. Dewes *(SRNL)*
Location: Virginia B **Time:** 1:00-4:15 pm

Great progress has been made over the last several years in reducing the quantity of highly enriched uranium (HEU) available as the target of terrorists. This panel session will feature the status of efforts within the primary NNSA office responsible for securing HEU materials around the world. Along with illustration of recent progress, the speakers will also illustrate the challenges they face in implementation of nonproliferation objectives for the materials that remain. Panelists and topics will include the following:

Material Management and Minimization (M3) Overview, Peter Hanlon *(NNSA)*

Establishment of Domestic Non-HEU-Based Mo-99 Production, Jeff Chamberlin *(NNSA)*

Conversion of Chinese-Origin Miniature Neutron Source Reactors (MNSRs), Brian Waud *(NNSA)*

HEU Down-Blending, Scott Roeker *(NNSA)*

Emerging Threats Program, Ross Agee *(NNSA)*

Advocacy and Communication: A Clean Energy Discussion–Panel

Sponsored by: YMG
Session Organizer and Chair: Kelsey Amundson *(DNFSB)*
Location: Virginia C **Time:** 1:00-2:45 pm

Successfully advancing a pro-nuclear agenda today requires a diverse advocacy and communication tool set. Experts will discuss their personal involvement in nuclear advocacy, how to engage with the public on nuclear issues, and what they see for the future of nuclear advocacy. This panel will also discuss the impact of the internet and social media on science reporting, explore the rise of multimedia storytelling, and discover successful avenues to advance support for nuclear science and technology nationwide.

Panelists:
Katie Mummah *(Univ Wisconsin, Madison)*
Tay Stevenson *(Generation Atomic)*
Timothy Crook *(Transatomic)*
Harsh S. Desai (NEI, Energy Solutions, LLC)

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Nuclear Policy 101–Panel

Sponsored by: YMG
Session Organizer and Chair: Alyse M. Scurlock *(Duke Energy)*
Location: Virginia C **Time:** 3:05-4:15 pm

The Young Member's Group is happy to sponsor the American Nuclear Society's post card writing campaign at the Winter Conference. Attendees will learn about prominent nuclear policy issues during the first half of this session, and spend the second half breaking out into small groups by topic and writing to government officials of which attendees are constituents. Don't know who your state or federal officials are? Don't know what you would say to them if you did? Fear not! Handouts with topics and talking points, as well as resources to reference will be provided. We will even help you find your post card recipient and provide examples! Want to do some research on your own or fill out additional post cards at a later time? Resources, post cards, and stamps will be located at the student headquarters for the duration of the conference. Resources can be found at any time at the following website: https://goo.gl/jsv2iF.

Keynote speaker:
Steve Nesbit *(Duke Energy)*

Small group leaders:
Craig Piercy *(ANS Washington Representative)*
Benjamin Reinke *(US Senate)*
David Fein *(Exelon)*
Mike Twomey *(Entergy)*

Mathematical Modeling, Analytic Solutions, and Benchmarks

Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Randal S. Baker *(LANL)*
Location: Maryland A **Time:** 1:00-3:50 pm

1:05 pm: Comparison of Unresolved Resonance Region Cross Section Formalisms in Transport Simulations, Jonathan A. Walsh *(LLNL)*

1:30 pm: Reactor Dynamics Based on the Neutron Telegraph Equation, Muhammad Ramzy Altahhan, Maria N. Avramova, Kostadin N. Ivanov *(NCSU)*

1:55 pm: A New Analytical SN Solution in Slab Geometry, Dean Wang, Tseelmaa Byambaakhuu *(Univ Mass., Lowell)*

2:20 pm: A Stochastic Benchmark Problem for Depletion Algorithms, Colin Josey, Kord Smith, Benoit Forget *(MIT)*

3:00 pm: Benchmark Comparison of Monte Carlo Algorithms for Three-Dimensional Binary Stochastic Media, Patrick S. Brantley, George B. Zimmerman *(LLNL)*

3:25 pm: DPN Solution of the 1D Monoenergetic Neutron Transport Equation with Benchmarking, B. D. Ganapol, J. Patel *(Univ Arizona)*

Human Factors, Instrumentation, and Controls: General—III

Sponsored by: HFICD
Session Organizer: Kathryn Ann McCarthy *(Canadian Nuclear Labs)*
Chair: Jamie Coble *(Univ Tennessee)*
Location: Maryland C **Time:** 1:00-4:15 pm

1:05 pm: Advanced Analog Control Circuit of Auxiliary Feedwater for Coping with D3, Jae Hyun Im, Man Woo Kim, Jong Jae Choi *(KEPCO)*

1:30 pm: Point Source Method of Reconstruction from Distributed Measurement, Charles Stratton, Pavel Tsvetkov *(Texas A&M)*

1:55 pm: Penn State Breazeale Reactor Control System Replacement: System Development and Hardware-In-The-Loop Testing, Gokhan Corak, James Turso *(Penn State)*

2:20 pm: Combination of Unquantization Technique and Empirical Modeling for Industrial Applications, Fan Zhang, Samuel Boring, J. Wes Hines, Jamie Coble *(Univ Tenn., Knoxville)*, Kenny C. Gross *(Oracle)*

3:00 pm: Thermally Induced Bend Loss Analysis for Distributed Optical Sensing in Nuclear Reactors, Anthony Birri, Kelly McCary, Brandon Wilson, Thomas E. Blue *(Ohio State)*

3:25 pm: A System for Automatically Welding Seams in Vertical Planes, Hongbing Liu, Yuxiang Hong, Shuhe Chang, Dong Du, Guodong Peng, Li Wang *(Tsinghua Univ)*

3:50 pm: Experiments with Distributed Measurement of Radiation by Fiber Optic Intrinsic Sensors, Charles Stratton, Pavel Tsvetkov *(Texas A&M)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Dose Rates Assessment due to Spent Fuel and Activated Materials

Sponsored by: RPSD
Session Organizer and Chair: Irina I. Popova *(ORNL)*
Location: Maryland B **Time:** 1:00-3:25 pm

1:05 pm: Baselining a Spent Nuclear Fuel Cask Shielding Model, Riley Cumberland, Kaushik Banerjee *(ORNL)*

1:30 pm: Evaluation of Radiological Limitations of Melting Facility for the Treatment of Decommissioning Metallic Waste Using RESRAD-RECYCLE, Hyung-Woo Seo, Sang-Ho Lee, Chang-Lak Kim *(KEPCO)*

1:55 pm: Calculations vs. Measurements for Remnant Dose Rates from SNS Spent Structures, I. I. Popova, F. X. Gallmeier S. Trotter, M. Dayton *(ORNL)*

2:20 pm: Surface Dose Rate Distribution of a Spent Fuel Cask with SCALE, Yuan Gao, Christopher R. Greulich, James S. Tulenko, Andreas Enqvist, James E. Baciak *(Univ Florida)*

3:00 pm: The Effect of Constructed Mesh-Based Fluxes on Shutdown Dose Rate Calculations in Fusion Energy Systems, Moataz S. Harb, Paul P. H. Wilson, A. Davis *(Univ Wisconsin, Madison)*

New Nuclear Construction Around the World—Status Report–Panel

Sponsored by: OPD
Session Organizer: Edward L. Quinn *(Technology Resources)*
Cochairs: Edward L. Quinn *(Technology Resources)*, Mimi H. Limbach *(Potomac Communications Group)*
Location: Washington 1 **Time:** 1:00-4:15 pm

This session will provide an overview of new reactor deployment activities around the world. Speakers from U.S. DOE, NRC, industry and international participants with address new construction activities and lessons learned from the perspective of a number of countries active in this area, in both LWR and non-LWR applications.

Panelists:
Frank Akstulewicz *(NRC)*
Craig Welling *(DOE)*
Corey McDaniel *(CNL)*
Eben Mulder *(X-Energy)*

Young Professional Thermal-Hydraulic Research Competition

Sponsored by: THD **Cosponsored by:** YMG
Session Organizer: Rui Hu *(ANL)*
Cochairs: Rui Hu *(ANL),* Paolo Ferroni *(Westinghouse)*
Location: Washington 2 **Time:** 1:00-4:15 pm

1:05 pm: Physics-Constrained Machine Learning for Two-Phase Flow Simulation Using Deep Learning-Based Closure Relation, Chih-Wei Chang, Nam Dinh *(NCSU)*, Sacit M. Cetiner *(ORNL)*

1:30 pm: A High-Order Numerical Solver for the Two-Phase Two-Fluid Six-Equation Model with Realistic Equation of State, Guojun Hu, Tomasz Kozlowski *(Univ Illinois)*

1:55 pm: Inverse Uncertainty Quantification of TRACE Physical Model Parameters with Model Discrepancy, Xu Wu, Tomasz Kozlowski *(Univ Illinois)*

2:20 pm: Numerical Model of a High Temperature Helium Air-Ingress Experiment, Daniel Franken, Daniel Gould, Hitesh Bindra *(Kansas State)*

3:00 pm: Demonstration of Multi-Physics (Neutron Transport and Thermal Hydraulic) Coupling Methodology for Liquid-Fuel Based Nuclear Technology Application, Seung Jun Kim, Cynthia Buechler *(LANL)*

3:25 pm: CFD Study of Two-Phase Flow in a Helical Tube, M. Santinello *(Politecnico di Milano)*, M. Colombo *(Univ Leeds)*, A. Cammi, M. E. Ricotti *(Politecnico di Milano)*

3:50 pm: URANS Simulations of Cross-Flow Over a Single Cylinder Using Nek5000, Dillon R. Shaver *(ANL)*, Lane B. Carasik *(Texas A&M)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Reactor Physics: General—II

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Sunil Sunny Chirayath *(Nuclear Security Science & Policy Inst.)*
Location: Washington 3 **Time:** 1:00-4:15 pm

1:05 pm: Heavy Water Moderated, Molten Uranium Reactor Control System, Neal L. Mann *(Neal Mann & Associates)*

1:30 pm: Preliminary Neutronic Analysis for a Small Modular Reactor Cooled by Fluoride Salt, Sijia Liu *(Shanghai Inst. Applied Physics, Univ Chinese Academy of Sciences)*, Yang Zou, Hong-Jie Xu *(Shanghai Inst. Applied Physics)*

1:55 pm: Numerical Artifacts in On-the-Fly Doppler Broadening Near Reference Temperatures, Kyle M. Ramey, Bojan Petrovic *(Georgia Tech)*

2:20 pm: Design Optimization Studies for a High Flux Isotope Reactor Low-Enriched Uranium Core, B. R. Betzler, D. Chandler, E. E. Davidson, G. Ilas *(ORNL)*

3:00 pm: Estimation of Modeling Approximation Error of Core Analysis Using the Surrogate Model with Kriging, Tomomi Hanai, Tomohiro Endo *(Nagoya Univ)*, Yasuhiro Kodama, Yasunori Ohoka *(Nuclear Fuel Industries, Ltd.)*, Akio Yamamoto *(Nagoya Univ)*

3:25 pm: Study on the Use of Thorium in a Lead-Cooled Fast Reactor, Luis Carlos Juarez Martinez, Juan-Luis François *(Univ Nacional Autónoma de México)*

3:50 pm: Application of Probability Table Method for Unresolved Resonance Self-Shielding in Deterministic Codes, Changhyun Lim, Han Gyu Joo *(Seoul National Univ)*, Won Sik Yang *(Purdue Univ)*

International Decommissioning—III: Fukushima, Chernobyl, and TMI 2–Panel

Sponsored by: DESD
Session Organizer: Yasuo Onishi *(Yasuo Onishi Consulting LLC)*
Chair: James J. Byrne *(Byrne & Assoc)*
Location: Washington 4 **Time:** 1:00-4:15 pm

Fukushima
Yoshiyuki Ishizaki *(Tokyo Holdings)*
Takashi Hara *(TEPCO Holdings)*
Kaname Miyahara *(JAEA)*
Tadahiro Washiya *(JAEA)*

Chernobyl
Gunter G. Pretzsch *(GRS)*
Victor Knasnov *(Inst. for Safety Problems of Nuclear Power Plants)*
Pavel Krukovskyi *(Inst. Engineering Thermophysics)*

Three Mile Island
James Byrne *(Byrne & Assoc)*

Research Opportunities in Advanced Fission and Fusion Materials–Panel

Sponsored by: FED **Cosponsored by:** MSTD
Session Organizer: Arnold Lumsdaine *(ORNL)*
Chair: Brian D. Wirth *(Univ Tennessee)*
Location: Hoover **Time:** 1:00-4:15 pm

The development and qualification of advanced materials was recently identified as one of the ANS "Grand Challenges". The development of advanced fission and fusion reactor designs will require new materials to be optimized. This panel will examine the research needs, and areas of synergy, for next generation fission and fusion facilities.

Panelists:
Perspectives from NSUF, Rory Kennedy *(INL)*
Perspectives from GAIN, Rita Baranwal *(INL)*
Materials Needs for Advanced Fission Reactors, Bill Corwin *(DOE)*
Materials Developments for Fusion, Daniel Clark *(DOE)*
Materials Development for NE, Sue Lesica *(DOE)*
Silicon Carbide, Lance Snead *(State Univ New York)*
Nano Structured Alloys, Steve Zinkle *(Univ Tenn., Knoxville)*

WEDNESDAY, NOVEMBER 1

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Nuclear Installations Safety: General—I

Sponsored by: NISD
Session Organizer and Chair: Nicholas R. Brown *(Penn State)*
Location: Coolidge **Time:** 1:00-3:25 pm

1:05 pm: SAMG-D: The IAEA Training Toolkit on the Development of Severe Accident Management Guidelines, Ibrahim Khamis *(IAEA)*

1:30 pm: Results of the DEFOR-ROD1 Test on the Influence of BWR Control Rod Guide Tubes on Melt Jet Fragmentation, A. Miassoedov, G. Albrecht, B. Fluhrer *(Karlsruhe Inst. Technol.)*, A. Karbojian, A. Konovalenko, P. Kudinov, S. Bechta *(Royal Inst. Technol.)*

1:55 pm: Integration of Ultrasonic Measurement and Robotic System for Measurement in NPP Decommissioning for Fukushima, A. Hamdani *(Tokyo Inst. Technol.)*, N. Tsuzuki *(Inst. Applied Energy)*, G. Endo *(Tokyo Inst. Technol.)*, K. Kazushi *(Okayama Univ)*, H. Kikura *(Tokyo Inst. Technol.)*

2:20 pm: Evaluation of Cooling Characteristics of SFP Spray with MAAP5.04, Satoshi Nishimura, Masaaki Satake, Yoshihisa Nishi *(Central Research Inst. Electric Power Industry)*, Yoshiyuki Kaji, Yoshiyuki Nemoto *(JAEA)*

3:00 pm: Methodology Development for Combined Evaluation of Security and Safety Risk, Patrick J. O'Neal, Sunil S. Chirayath *(Texas A&M)*

Reactor Physics Challenges in Molten Salt Reactor Design—II

Sponsored by: RPD
Session Organizer: Massimiliano Fratoni *(Univ California, Berkeley)*
Chair: Phil Sharpe *(INL)*
Location: Harding **Time:** 1:00-2:20 pm

1:05 pm: Progress Towards a Molten Salt Reactor Experiment Benchmark Evaluation, Dan Shen, Massimiliano Fratoni, Manuele Aufiero *(Univ California, Berkeley)*, Adrien Bidaud *(LPSC)*, Jeffrey Powers, Germina Ilas *(ORNL)*

1:30 pm: Core Neutronic Characterization of a Large Fluoride-Salt-Cooled Fast Reactor, Yu Peng *(Shanghai Inst. Applied Physics, CAS)*, Yang Zou, Hong-Jie Xu *(Shanghai Inst. Applied Physics)*

1:55 pm: Fuel Cycle Modeling and Simulation of the Molten Salt Breeder Reactor, Zachary G. Skirpan *(U.S. Naval Academy)*, B. R. Betzler, J. J. Powers *(ORNL)*, S. M. Blair *(U.S. Naval Academy)*

Reactor Physics Challenges in Molten Salt Reactor Design—III–Panel

Sponsored by: RPD
Session Organizer: Fausto Franceschini *(Westinghouse)*
Chair: Florent Heidet *(ANL)*
Location: Harding **Time:** 3:05-4:15 pm

A variety of MSR concepts (solid and liquid fuel) have gained national and international interest and attracted significant governmental and private funds.

As these concepts get developed, new challenges are expected to arise in many areas, including reactor physics. Modeling tools, data availability, uncertainty are just a few examples. The proposed panel should provide highlights on their design and a description of resolved and outstanding challenges in the reactor physics area.

Panelists:
Nicholas V. Smith *(Southern Co.)*
Kun Chen *(SINAP)*
A.L. Qualls *(ORNL)*
Jean Ragusa *(Texas A&M)*

TECHNICAL SESSIONS – 4:30 PM

Data, Analysis, and Operations in Nuclear Criticality Safety—II

Sponsored by: NCSD
Session Organizer: Theresa E. Cutler *(LANL)*
Chair: Kristin N. Smith *(Univ Florida)*
Location: Delaware B **Time:** 4:30-6:40 pm

4:35 pm: From Criticality Incredible Project Plan to Facility Hazard Categorization Downgrade, Tom Hines *(DOE)*, Matthew Wilson *(Paschal Solutions Inc.)*

5:00 pm: Application of Nuclear Criticality Safety to Early Earth Age Uranium, Norman Schwers, John A. Miller *(Sandia)*

5:25 pm: PWR Fuel Reactivity Depletion Uncertainty Quantification–Methods Validation Tests, Kord Smith, Elliot Sykora, Geoff Gunow *(MIT)*, Hatice Akkurt *(EPRI)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1
TECHNICAL SESSIONS – 4:30 PM

Research by U.S. DOE NEUP-Sponsored Students—III
Sponsored by: ETWDD
Session Organizer: Cheresa Novich *(INL)*
Chair: Gregory A. Bala *(INL)*
Location: Virginia A **Time:** 4:30-6:40 pm

4:35 pm: Design of Neutronics and Thermal Hydraulics Coupling Critical Experiments, Mathieu Dupont, Matthew D. Eklund, Wei Ji, Peter F. Caracappa *(RPI)*

5:00 pm: Design of Turbulent MHD Experimental Flow Loop for CFD Validation, Joshua Morsell, Asish Andhavarapu, Steven Shannon *(NCSU)*

5:25 pm: Evaluation of the Thermal Neutron Scattering Law for a Heavy Paraffinic Molecular Material, C. A. Manring, A. I. Hawari *(NCSU)*

5:50 pm: Experimentally-Benchmarked CFD Model to Predict Cladding Temperatures During Vacuum Drying, Dilesh Maharjan, Mustafa Hadj-Nacer, Miles Greiner *(Univ Nevada, Reno)*

6:15 pm: Radiation Grafted Fabrics for the Extraction of Uranium from Seawater, Travis C. Dietz, Zois Tsinas, Eli Fastow *(Univ Maryland)*, William Li *(Catholic Univ America)*, Dianne Poster *(NIST)*, Mohamad Al-Sheikhly *(Univ Maryland)*

Nuclear Nonproliferation Policy: General
Sponsored by: NNPD
Session Organizer and Chair: Kelsey Amundson *(DNFSB)*
Location: Virginia B **Time:** 4:30-5:25 pm

4:35 pm: Comparison of Aluminum Activation Rates in HFIR and NBSR for Antineutrino-Based Safeguards, Andrew Conant, Anna S. Erickson *(Georgia Tech)*, Pieter Mumm *(NIST)*

5:00 pm: Assessing Bilateral Nuclear Security Regimes and Illustrating Profitability from Insecurity, Claudio A. Gariazzo *(Texas A&M)*

Uncertainty Quantification and Sensitivity Analysis—I
Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Steven P. Hamilton *(ORNL)*
Location: Maryland A **Time:** 4:30-6:40 pm

4:35 pm: Monte Carlo Estimates of Reaction Rate and Kinetics Parameter Sensitivities to System Dimensions, Timothy P. Burke, Brian C. Kiedrowski *(Univ Michigan)*

5:00 pm: Evaluation of Wilks' One-Sided Non-Parametric Formula Against Analytical Parametric Methods, Brian Hallee, Kyle Metzroth *(MPR Associates)*

5:25 pm: Second-Order Sensitivity Analysis of Uncollided Particle Contributions to Radiation Detector Responses: I. Theory, Dan Gabriel Cacuci *(Univ South Carolina)*, Jeffrey A. Favorite *(LANL)*

5:50 pm: Second-Order Sensitivity Analysis of Uncollided Particle Contributions to Radiation Detector Responses: II. Results, Jeffrey A. Favorite *(LANL)*, Dan Gabriel Cacuci *(Univ South Carolina)*

6:15 pm: Reconstructing Gamma-Ray Source Material Weight Fractions Using Constrained Sensitivities, Ryan O'Mara *(NCSU)*, Jeffrey A. Favorite *(LANL)*

Reactor Analysis Methods—II
Sponsored by: RPD
Session Organizer and Chair: Cristian Rabiti *(INL)*
Location: Maryland B **Time:** 4:30-6:40 pm

4:35 pm: Application of the GENESIS Code to the Kobayashi 3D Benchmark Problem, Akio Yamamoto, Akinori Giho, Tomohiro Endo *(Nagoya Univ)*

5:00 pm: A Perturbation Theory Method for Evaluating Reactivity Worth of Assembly Displacements in Fast Reactors, T. Jing, W. S. Yang *(Purdue Univ)*

5:25 pm: New PHISICS Perturbation Method Module Verification Using the HTTR Neutronic Model, Paolo Balestra *("Sapienza" Univ)*, Andrea Alfonsi, Gerhard Strydom, Ramazan S. Sen, Cristian Rabiti *(INL)*, Fabio Giannetti, Gianfranco Caruso *("Sapienza" Univ)*

5:50 pm: Fuel Performance Coupling of FRAPCON Within MCS, Jiankai Yu, Soojin Lee, Deokjung Lee *(Ulsan National Inst. Sci. Technol.)*

6:15 pm: Variable Time Stepping and Coupling Improvements for Transients in VERA-CS, Andrew R. Gerlach, John C. Lee *(Univ Michigan)*

WEDNESDAY, NOVEMBER 1
TECHNICAL SESSIONS – 4:30 PM

The DNP Initiative for U.S. Nuclear Power Plants–Panel
Sponsored by: OPD
Session Organizer and Chair: Kenneth Ferguson *(Advanced Nuclear Technology, Global Nuclear Associates)*
Location: Washington 1 **Time:** 4:30-6:40 pm

The Nuclear Energy Institute (NEI) on behalf of the utilities in the United States involved in nuclear power generation has formulated, coordinated, and is implementing through its members the DNP (Delivering the Nuclear Promise) initiative focused on attaining significant advances in the efficiency and economics of the fleet of nuclear power plants in the USA. This panel will identify and discuss examples of specific types of related attentions that can be leveraged, relevant, and can contribute to attaining the DNP objectives.

Panelists:
Chuck Morris *(Duke Energy)*
Rosemary Yeremian *(Strategic Insights,Inc.)*
Sandra Dimatteo *(Bentley Systems)*
Joe Pollock *(NEI)*

Severe Accident Modeling and Experiments for Advanced Reactor Safety
Sponsored by: THD
Session Organizer: Adrian Tentner *(ANL)*
Cochairs: Adrian Tentner *(ANL)*, Heung Seok Kang *(KAERI)*
Location: Washington 2 **Time:** 4:30-6:40 pm

4:35 pm: LEVITATE-M: The Fuel Relocation Model of the SAS4A Code for the Analysis of Postulated Severe Accidents in Metal Fuel Sodium Fast Reactors, A. M. Tentner, A. Karahan *(ANL)*

5:00 pm: Preliminary Analysis of Initial Phase Severe Accident for PGSFR Using Metal Fuel Version SAS4A Code, S. H. Kang *(KAERI)*, A. M. Tentner, A. Karahan *(ANL)*, K. L. Lee *(KAERI)*

5:25 pm: An Experimental Study of Jet Impingement in a Scaled Model of a Very High Temperature Reactor, Anas Alwafi, Saya Lee, N. K. Anand, Yassin Hassan *(Texas A&M)*

5:50 pm: Metallic Fuel Relocation Behavior in a Single-Pin Core Structure of a SFR, Taeil Kim, Dzmitry Habaruk, Craig Gerardi, Mitchell Farmer, Yoon Il Chang *(ANL)*

6:15 pm: Severe Accident Analysis of the Advanced Test Reactor, Andrew Keene, Kyle Metzroth, Collin Clark, Jonas England *(MPR Associates)*

Experimental Thermal Hydraulics—II
Sponsored by: THD
Session Organizer: Sama Bilbao y Leon *(Virginia Commonwealth Univ)*
Cochairs: Wade R. Marcum *(Oregon State Univ)*, Fan-Bill Cheung *(Penn State)*
Location: Washington 3 **Time:** 4:30-6:40 pm

4:35 pm: Wettability and Quench Characteristics of Zircaloy and FeCrAl Coating, Arunkumar Seshadri, Koroush Shirvan *(MIT)*

5:00 pm: Pre-and Post-CHF Study at the High Pressure Heat Transfer Facility, Juliana P. Duarte, Hangjin Jo, Michael L. Corradini *(Univ Wisconsin, Madison)*

5:25 pm: An Investigation of the Dominate Plate Modes from End Excitation, T. K. Howard, W. R. Marcum *(Oregosn State)*, W. F. Jones *(INL)*

5:50 pm: Experimental Investigations of Horizontal Gas-Liquid Bubbly Flows Using Selected Measurement Techniques, Sun-Kyu Yang, Robert C. Bowden *(CNL)*

6:15 pm: A New CHF Prediction Correlation by Different Inclined Angles on a Downward Facing Surface, Hsieh Huai-En, Chen Mei-Shiue, Yen-Cheng Liu *(Tsing Hua Univ)*

Technical Sessions: Wednesday November 1

WEDNESDAY, NOVEMBER 1
TECHNICAL SESSIONS – 4:30 PM

Education, Training, and Workforce Development: General
Sponsored by: ETWDD
Session Organizer and Chair: Lisa M. Marshall *(NCSU)*
Location: Hoover **Time:** 4:30-7:05 pm

4:35 pm: Reactor Plant Simulator Effectiveness for Nuclear Engineering Technology Degree, Michael Johnson *(Excelsior College)*, Majid Mirshah *(WSC, Inc.)*, Sean Riley *(Excelsior College)*

5:00 pm: Advances in Teaching and Training Reactor Physics, Luka Snoj *(Jožef Stefan Inst., Univ Ljubljana)*, Dan Toškan, Jan Malec, Jure Beričič, Anže Jazbec, Sebastjan Rupnik *(Jožef Stefan Inst.)*, Lucijan Plevnik *(Univ Ljubljana)*, Bor Kos, Gašper Žerovnik *(Jožef Stefan Inst.)*

5:25 pm: Training for Next Generation Security for Nuclear Transport, Kenneth Sanders, Ronald Pope, Yung Y. Liu *(ANL)*, James Shuler *(DOE)*

5:50 pm: Development and Assessment of University of Nevada, Reno Graduate Certificate in Nuclear Packaging, Miles Greiner *(Univ Nevada, Reno)*, Yung Y. Liu *(ANL)*, James Shuler *(DOE)*

6:15 pm: Development of Criticality Safety Pipeline Courses at Partnering Universities, James Bunsen, Elijah Wade, Andrew Wysong *(LANL)*

6:40 pm: Development of Desktop Plant Simulator to Treat Simultaneous Accident Progress in Reactor and Spent Fuel Pools, Yoshitaka Sugiura, Ryunosuke Yamaguti, Daisuke Fujiwara, Osamu Kubota *(TEPCO)*

Current Topics in Probabilistic Risk Analysis
Sponsored by: NISD
Session Organizer: Nicholas R. Brown *(Penn State)*
Chair: Nathan R. Labarge *(Westinghouse)*
Location: Coolidge **Time:** 4:30-6:40 pm

4:35 pm: Construction of Multi-Path Event Tree for Station Blackout Events, Sungkyum Kim *(Pohang Univ Sci. Technol.)*, Junjie Guo *(Univ Michigan)*, Kwang-Il Ahn *(KAERI)*, John C. Lee *(Pohang Univ Sci. Technol., Univ Michigan)*

5:00 pm: Multi-Module PRA Approach for the Xe-100, Alexander J. Huning *(X-Energy LLC.)*, Karl N. Fleming *(Technology Insights)*

5:25 pm: Review of Safety Goals for Nuclear Power Plants in Korea, Ji Suk Kim, Man Cheol Kim *(Chung-Ang Univ)*

5:50 pm: Risk Monitoring Capabilities from Dynamic PRA Data, D. Mandelli, A. Alfonsi, C. Smith *(INL)*

6:15 pm: An Introduction to Reliability-Fundamentally Safety Assessment Techniques of Nuclear Safety, Gangyang Zheng, Zhijian Zhang, Chen Sijuan *(Harbin Engineering Univ)*, Zibin Liu *(China Nuclear Power Design Co.)*, Xu Anqi, Ma Yingfei, Zhang Huazhi *(Harbin Engineering Univ)*

Reactor Physics Challenges in Current LWR Fleet–Panel
Sponsored by: RPD
Session Organizer and Chair: Amanda L. Lang *(Duke Energy)*
Location: Harding **Time:** 4:30-6:40 pm

Join us for an industry perspective of currently limiting parameters in today's core designs followed by updates on new and developing tools to potentially address some of these challenges. Topics will include burnup limitations, max clad temperature, ARCADIA modeling software, and Risk Informed Safety Margin Characterization. This will be followed by Q&A and an open discussion to explore potential collaborations between industry and ongoing research.

Panelists:
Casey Klein *(Duke Energy)*
Paul Cantonwine *(GNF)*
Juswald Vedovi *(GEH)*
Gregory Meinweisser *(Dominion)*
Greg Hobson *(AREVA)*
Ronaldo Szilard *(INL)*

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Nuclear Waste Management and Remediation

Sponsored by: FCWMD
Session Organizer: Jared A. Johnson *(ORNL)*
Chair: Stephanie H. Bruffey *(ORNL)*
Location: Delaware A **Time:** 8:00-11:40 am

8:05 am: Waste Minimization of Electrorefiner Waste Salt via Dechlorination: A New Approach, Manish Wasnik, Krista Carlson, Michael F. Simpson *(Univ Utah)*

8:30 am: Radiation-Induced Phase Transformation of Apatite Under Ion Beam, Jianren Zhou, Fengyuan Lu *(Louisiana State)*

8:55 am: Compositional Analysis of Cerium in Rapid Setting Cement as an Immobilization Agent for Nuclear Waste, Riyadh Motny, Supathorn Phongikaroon *(Virginia Commonwealth Univ)*

9:35 am: Adsorbent Pore Structure Effects on Uranium Sequestration, Briana Aguila, Qi Sun, Shengqian Ma *(Univ South Florida)*

10:00 am: Defect Perovskite Waste Forms for the Disposal of Iodine-129, Spencer M. Scott, Weiguang Zhu, Jie Lian *(RPI)*

10:25 am: Microstructural Development of a Borosilicate Glass-Ceramic for Waste Vitrification–Part I, Paul Porter, Nicholas Roberts, Richard K. Brow *(Missouri Univ Sci. Technol.)*

10:50 am: Microstructural Development of a Borosilicate Glass-Ceramic for Waste Vitrification–Part II, Paul Porter, Nicholas Roberts, Richard K. Brow *(Missouri Univ Sci. Technol.)*

11:15 am: EPA Superfund Disposition of Radioactive Waste in Non-Licensed Disposal Facilities, Stuart Walker *(U.S. EPA)*

ANS-8 Standards Process, Current Revisions, and Connections to Wider Standards Organizations–Panel

Sponsored by: NCSD **Cosponsored by:** YMG
Session Organizer and Chair: Douglas G. Bowen *(ORNL)*
Location: Delaware B **Time:** 8:00-9:20 am

Panel session about the workings of and interfaces between the Nuclear Criticality Safety Consensus Committee (NCSCC; aka N-16), ANS-8 sub-committee, ANS-8 working groups, and the Nuclear Criticality Safety Division (NCSD). The presentations will cover an outline of the overall Standards processes within ANS, focusing on where the NCS related standards committees, sub-committees and working groups fall in that process. How NCS standards perform/are perceived/used as compared to other ANS standards activities. Specific discussion about the workings of ANS-8 and the 19 active working groups that it oversees and a where each of those working groups are within the standards process. There will be a detailed discussion about a specific standard, either recently issued or will be issued in the short term. There will be an overview of the how the NCSD supports and interacts with the NCS related standards effort and how individuals can get involved in these efforts. Following the panel discussion, the normal ANS-8 Standards Forum will be held where each working group provides and update on current progress and information is shared between the various working groups-this occurs in the second part of this session.

Panelists:
Doug Bowen *(LANL)*
Deborah Hill *(UK National Nuclear Lab)*
Larry Wetzel *(BWX Technologies)*
John Miller *(SNL)*

ANS-8 Standards Forum

Sponsored by: NCSD
Session Organizer and Chair: Douglas G. Bowen *(ORNL)*
Location: Delaware B **Time:** 9:35-11:40 am

Panelists to be announced.

Technical Sessions: Thursday November 2

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Materials Aging in Nuclear Plant Operations (metals, concrete, cables, condition monitoring, etc.)

Sponsored by: MSTD
Session Organizer and Chair: Leo S. Fifield *(PNNL)*
Location: Virginia A **Time:** 8:00-11:15 am

8:05 am: Tracking Aging in Nuclear Electrical Cable Polymers, Leonard S. Fifield *(PNNL, Washington State Univ)*, Yongsoon Shin *(PNNL)*

8:30 am: High Temperature Sliding Wear Behavior of Ni Alloys Under Helium Environment, Md Saifur Rahman, Andreas A. Polycarpou *(Texas A&M)*

8:55 am: Time Temperature Precipitation Diagram and Qualitative Validation for Alloy 709, A. Carter, T. Porter, K. O. Findley, M. K. Kaufman *(Colorado School of Mines)*

9:35 am: Probabilistic Degradation Models for Cable Insulation in Nuclear Power Plants, Yuan-Shang Chang, Ali Mosleh *(UCLA)*

10:00 am: High Temperature Nanoindentation of Ni Alloys Under Helium Environment, Md Saifur Rahman, Pixiang Lan, Andreas A. Polycarpou *(Texas A&M)*

10:25 am: Overview of the Electric Power Research Institute's Research for Long Term Operations, Emma L. Wong, Sherry Bernhoft *(EPRI)*

10:50 am: Consequence of Activation Energy and Mechanical Properties in Harvested I&C Cables, Robert Duckworth *(ORNL)*, Sarah Davis *(Univ Tenn., Knoxville)*

SCALE/ORIGEN for Nuclear Nonproliferation and Safeguards Applications–Tutorial

Sponsored by: NNPD
Session Organizers: Germina Ilas *(ORNL)*, Robert B. Hayes *(NCSU)*
Chair: Germina Ilas *(ORNL)*
Location: Virginia B **Time:** 8:00-11:40 am

The ORIGEN depletion and decay code in the SCALE Code System has been internationally used for decades to predict spent nuclear fuel compositions and radiation emissions that are essential for a broad spectrum of applications. The new ORIGEN release features a modernized, user-friendly input, with enhanced autocomplete and results display capabilities under the new SCALE graphical interface. The aim of this tutorial is to provide an overview of ORIGEN's capabilities, with a focus on those that directly support safeguards and nonproliferation applications. Hands-on examples will be included, such as estimation of uranium and plutonium in spent fuel for material reporting and calculation of neutron and gamma sources to support spent fuel verification. The tutorial is open to all participants at the conference. No prior experience with SCALE is required. Participants wishing to follow along with the tutorial should bring their own computer, have a valid license for SCALE 6.2.1 or the most recent version, and have this SCALE version installed on their computer.

Advancements in Radiation Measurement and Imaging Technology

Sponsored by: IRD **Cosponsored by:** BMD
Session Organizer: Igor Jovanovic *(Univ Michigan)*
Chair: Derek A. Haas *(Univ Texas)*
Location: Virginia C **Time:** 8:00-10:25 am

8:05 am: Effect of Source Geometry Modeling on Flux Distributions, Walid A. Metwally *(Univ Sharjah)*

8:30 am: The Fast Neutron Sensitivity of a SiC Detector, Lei Wang *(Ohio State, Chengdu Univ Technol.),* Josh Jarrell, Sha Xue, Thomas E. Blue, Lei R. Cao *(Ohio State)*

8:55 am: A New Phenomenological Model for Geiger-Müller Deadtime, S. Usman, B. Almutairi (*Missouri Univ Sci. Technol.)*, T. Akyurek *(Marmara Univ)*

9:35 am: Simulation Study on Electron Focusing for the First Prototype of a Compact X-Ray Tube, Ashish Avachat, Hyoung Koo Lee, Vaibhav Sinha *(Missouri Univ Sci. Technol.)*

10:00 am: Analysis of the New Core-Moderator Assembly and Beam Ports at the Penn State Breazeale Reactor, Andrew J. Bascom, William Walters, Kenan Unlu *(Penn State)*

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Uncertainty Quantification and Sensitivity Analysis—II

Sponsored by: MCD
Session Organizer: Jeffery D. Densmore *(BAPL)*
Chair: Adam G. Nelson *(Naval Reactors Headquarters)*
Location: Wilson B **Time:** 8:00-10:25 am

8:05 am: Assessment of Uncertainties in Energy Deposition Data for the Transient Test Facility (TREAT), Mark D. DeHart, Benjamin A. Baker, Javier Ortensi *(INL)*

8:30 am: Application of the Bias Factor Method Using the Random Sampling Technique for Prediction Accuracy Improvement of Neutronics Parameters of BWR, Motohiro Ito, Tomohiro Endo, Akio Yamamoto *(Nagoya Univ)*, Yusuke Kuroda, Takashi Yoshii *(TEPCO)*

8:55 am: Development of Two-Step Procedure for Uncertainty Analysis of VHTR Core Parameters, Tae Young Han, Jin Young Cho, Chang Keun Jo *(KAERI)*

9:35 am: Analytic Uncertainty Quantification for Factorial Moment Counting of Neutron Multiplicity Distributions, Michael Y. Hua, Tony H. Shin, Angela Di Fulvio, Shaun D. Clarke, Sara A. Pozzi *(Univ Michigan)*

10:00 am: Uncertainty Contribution Estimation for Monte Carlo Uncertainty Quantification via Parameter Space Analysis, Bassam A. Khuwaileh *(Univ Sharjah)*, Moh'd Al-Nimr *(Jordan Univ Sci. Technol.)*

Used Nuclear Fuel Challenges

Sponsored by: FCWMD
Session Organizer and Chair: Jared A. Johnson *(ORNL)*
Location: Wilson C **Time:** 8:00-10:50 am

8:05 am: Dry-Transfer System Lag-Storage Rack Applicability Evaluation for Utility Fuel Assemblies, Michael Smith, Sven Bader, Ashley Spry *(AREVA)*, Collin Dolan, Dmytro Zaytsev, Daniel Gryder, Nicholas Cesmat, Qutaiba Enaya, Michael Segura *(Univ North Carolina)*

8:30 am: Experience With Used Fuel Reimmersion for Repackaging After Three Years in Dry Storage, Rose Montgomery, John Scaglione *(ORNL)*, Brad Williamson, Brian Wakeman *(Dominion)*

8:55 am: Plasma Optical Emission Spectroscopy for Water Vapor Quantification in Used Fuel Drying Applications, Malik M. Tahiyat, Travis W. Knight, Tanvir I. Farouk *(Univ of South Carolina)*

9:35 am: Update on Accelerated Corrosion Tests for the Evaluation of Long-Term Performance of BORAL® in Spent Fuel Pools, Hatice Akkurt *(EPRI)*, Ashleigh Quigley, Matt Harris (*Curtiss-Wright)*

10:00 am: Gamma Scanning of 25 PWR Spent Fuel Rods in the High Burnup Spent Fuel Data Project, Rose Montgomery, Robert Morris, John Scaglione, Bruce Bevard *(ORNL)*

10:25 am: Initial Site-Specific Studies for De-Inventory of Spent Nuclear Fuel, Kevin J. Connolly, Matthew R. Feldman *(ORNL)*, Ralph E. Best, Steven J. Maheras *(PNNL)*, Don McGee, Sven O. Bader *(AREVA)*

Reactor Physics: General—III

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Matthew A. Jessee *(ORNL)*
Location: Maryland B **Time:** 8:00-10:50 am

8:05 am: Uncertainty Analysis for PWR On-Line Power-Distribution Monitoring Based on NECP-ONION, Liangzhi Cao, Zhuo Li, Hongchun Wu, Chenghui Wan *(Xi'an Jiaotong Univ)*

8:30 am: The Precursor-Based Delayed Neutrons Emission Model Applied to a Water Level Transient, A. Talamo, Y. Gohar *(ANL)*, J. Leppänen, V. Valtavirta *(VTT)*

8:55 am: Falsification of Reactor State via Data Deception Attacks, Hany S. Abdel-Khalik (Purdue Univ), Said I. Abdel-Khalik *(Georgia Tech)*

9:35 am: A Multi-Purpose Homogeneous-Node Benchmark for PHWR Configurations, Peter Schwanke, Qingjie Liu, Eleodor Nichita *(Univ Ontario Inst. Technol.)*

10:00 am: BWR Geometry Enhancements for the Polaris Lattice Physics Code, Matthew A. Jessee, William A. Wieselquist, Cole A. Gentry, Ugur Mertyurek *(ORNL)*

10:25 am: A Hybrid (γ,n) and (n,γ) Transmutation Study for Long-Living Fission Products, Haseeb ur Rehman, Jiyoung Lee, Yonghee Kim *(KAIST)*

Technical Sessions: Thursday November 2

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Operations and Power: General

Sponsored by: OPD
Session Organizer and Chair: Vince V. Gilbert *(EXCEL Services)*
Location: Washington 1 **Time:** 8:00-10:50 am

8:05 am: Influence of Nuclear Energy on Limiting Global Warming to 2°C, Xuewei Fu, Minghuang Wang, Dehong Chen, Wenliang Zhang, Chao Lian, Baojie Nie, Zhibin Chen, FDS Team *(Inst. Nuclear Energy and Safety Tech)*

8:30 am: SAS4A/SASSYS-1 Simulation of ARC System in Oxide ABR for Improved Safety Margin, Chris Keckler, Staffan Qvist *(Univ California, Berkeley)*, Thomas Fanning *(ANL)*, Massimiliano Fratoni, Ehud Greenspan *(Univ California, Berkeley)*

8:55 am: Bottom-Up Capital Cost Estimation for Generation IV Small Modular Reactors, Benjamin Vegel *(Utah State)*, Jason C. Quinn *(Colorado State)*

9:35 am: Thermal Transport in Thorium Dioxide, Jungkyu Park, Eduardo B. Farfán *(Kennesaw State)*

10:00 am: Intergral Modularity as a Design Approach for Customizable Multi-Product Output Applications, P. Tsvetkov *(Texas A&M)*

10:25 am: Protection via Cyber Security Event Analysis Framework Using Full-Scope Plant Simulator Capabilities, P. Tsvetkov *(Texas A&M)*, A. Cardenas *(Univ Texas, Dallas)*, M. Manic *(Virginia Commonwealth Univ)*, J. Wilhelm *(GSE Performance Solutions)*

Computational Thermal Hydraulics—II

Sponsored by: THD
Session Organizer: Jovica R. Riznic *(Canadian Nuclear Safety Comm)*
Cochairs: Elia Merzari *(ANL)*, Matthew D. Zimmer *(NCSU)*
Location: Washington 2 **Time:** 8:00-11:15 am

8:05 am: Application of Global Sensitivity Analysis Methods to LOCA Simulations, Hongbin Zhang *(INL)*

8:30 am: Reactor Core Isolation Cooling System Scaling Analysis Methodology, Mohammad Hawila, Karen Vierow Kirkland *(Texas A&M)*

8:55 am: A Comparative Study of Turbulence Models for Thermal Hydraulic Analysis in Reactor Vessel Internals of APR1400, Hyuksu Cho, Kunwoo Yi, Hocheol Jang, Byungryul Jung, Seongchan Park *(KEPCO)*

9:35 am: Two Stage DNBR Analysis Model for SLB Accident, Chongkuk Chun, Beomjun Jang, WiSoo Jeong, Iltak Woo, Hongju Kim *(KEPCO)*

10:00 am: Study on the Bubble Coalescence and Breakup in Fuel Assembly, Tenglong Cong, Zhaofei Tian, Minjun Peng *(Harbin Eng Univ)*

10:25 am: Thermal-Hydraulic Characteristics Analysis in a Steam Generator Coupled with Incomplete Support Plates, Jiannan Tang, Mei Huang, Xiaoping Ouyang *(North China Electric Power Univ)*

10:50 am: Numerical Study on Flow Characteristic in Single Loop of Natural Circulation System Under Ocean Motion, Sipeng Wang, Bao-Wen Yang, Zhaobo Zhou *(Xi'an Jiaotong Univ)*

Advanced Technologies and Analyses for Nuclear Reactors, Fusion Systems and Accelerator Applications—I

Sponsored by: FED **Cosponsored by:** AAD
Session Organizer and Chair: Arnold Lumsdaine *(ORNL)*
Location: Washington 3 **Time:** 8:00-11:15 am

8:05 am: Code-to-Code Comparisons with DRAGON and DONJON for Thorium-Based Fuels in Pressure-Tube Heavy Water Reactors, S. Golesorkhi, A. Colton, Blair P. Bromley, H. Yan *(CNL)*

8:30 am: Study of an Inter-Wrapper Flow Model and Effects in Sodium-Cooled Fast Reactor, Dalin Zhang, Ping Song, Shibao Wang, Xin'an Wang, Jing Chen, Nina Yue, Wenxi Tian, Suizheng Qiu, G. H. Su *(Xi'an Jiaotong Univ)*

8:55 am: Accident Analysis of Tokamak-Type Fusion Power Plants for Off-Site Evacuation, Shanqi Chen, Jiaqun Wang, Daochuan Ge, Zhen Wang, Zhibin Chen *(Inst. Nuclear Energy Safety Technol.)*

9:35 am: Laser Ablation Inductively Coupled Plasma Mass Spectrometry Isotope Analysis in Nuclear Fusion Research, Jack Nowotarski, Jonah Duran *(Univ Tenn., Knoxville)*, Mike Zach *(ORNL)*, David Donovan *(Univ Tenn., Knoxville)*

10:00 am: Electrically-Assisted Forming of Oxide Dispersion Strengthened Structural Materials, Zilin Jiang, Qiang Zeng, Man-Kwan Ng, Kornel F. Ehmann *(Northwestern Univ)*, Osman Anderoglu *(Univ New Mexico)*, Stuart Maloy *(LANL)*, Jian Cao *(Northwestern Univ)*

10:25 am: Recent Progress on Fusion Research in INEST, Yican Wu, FDS Team *(Inst. Nuclear Energy Safety Technol.)*

10:50 am: A Symbiotic Approach to Compact Fission and Fusion Reactors, Richard J. Pearson *(The Open Univ)*, Michael J. Bluck *(Imperial College London)*, Samuel T. Murphy *(Lancaster Univ)*

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

U.S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—I–Tutorial

Sponsored by: DESD
Session Organizer and Chair: Stuart A. Walker *(EPA)*
Location: Washington 4 **Time:** 8:00-11:40 am

U.S. EPA Superfund Radiation Risk Assessment is a full-day advanced course that focuses on specific technical and regulatory issues that site managers (e.g., RPMs, OSCs) and technical staff address when managing sites under the U.S. Environmental Protection Agency's Superfund remedial program that have a risk assessment conducted for radioactive contaminants. By taking the course, participants achieve the following objectives:

- Learn a step-by-step approach to the Superfund remedial program's risk assessment process for radioactive contamination. The course discusses of the major steps in Superfund remedial program's risk assessment for radioactive contamination and the EPA recommended guidance documents and calculators and or models for conducting such risk assessments.
- Explore methods for conducting site-specific risk assessments. The course examines how to alter the default input parameters in the Superfund remedial program's risk and dose assessment calculators.
- Discover practical recommendations for improving the radiation risk assessments conducted at your site. The course stresses some obvious and other less obvious aspects helpful in improving the radiation risk assessment process.
- Master information about the radiation risk assessment process. Participants obtain information from experienced professionals about the radiation risk assessment process.

The instructional methodology for this course includes lectures and demonstrations of using EPA's risk and dose assessment calculators developed by the Superfund remedial program. Please bring your LAPTOP to this training!!!

The target audience for this course is site managers, risk assessors and others that want to obtain a working knowledge on conducting Superfund radiation risk assessments.

- Stuart Walker, EPA Office of Superfund Remediation and Technology Innovation (Instructor)

Outline of Training

1. How Radiation Fits in Superfund
2. Radiation Risk Assessment
3. Radiation Risk Assessment Video and Community Toolkit
4. PRG Calculator
5. DCC Calculator
6. RSL Calculator
7. BPRG and BDCC Calculators
8. SPRG and SDCC Calculators
9. Differences between EPA and DOE Tools
10. BCG Calculator
11. CPM Calculator
12. SADA

For related training you might wish to review before this training, there are two ITRC online archived classes that cover some of the material in less detail:

"Radiation Risk Assessment-Radiation Risk Assessment: Updates and Tools." https://clu-in.org/conf/itrc/rads_051507/

Modules 3 and 4 provide a quick tutorial on using the PRG calculator and a hypothetical site example of using the PRG calculator "Decontamination and Decommissioning of Radiologically-Contaminated Facilities" https://clu-in.org/conf/itrc/radsdd_040308/ Module provides a quick tutorial on using the BPRG and SPRG calculator

Another resource you might find useful is this extensive presentation for the Superfund Radiation Risk Assessment Calculator Training: https://semspub.epa.gov/work/HQ/100000142.pdf

This is a background resource that goes over the type of material that this course will cover and is a good support for what will be covered in the class.

For general information contact Stuart Walker by telephone at 703-603-8748 or via e-mail at walker.stuart@epa.gov

Technical Sessions: Thursday November 2

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 8:00 AM

All morning sessions feature a coffee break at 9:20 am

Innovations in Nuclear Technology R&D Awards

Sponsored by: ETWDD
Session Organizer and Chair: Cathy S. Dixon *(West Texas A&M)*
Location: Hoover **Time:** 8:00-10:50 am

8:05 am: Complexation Thermodynamics of Oxalate with Hf(IV) for Application to Nuclear Fuel Reprocessing, Mitchell T. Friend, Nathalie A. Wall *(Washington State Univ)*

8:30 am: Evaluation of Simultaneous Ion Irradiation and Liquid Metal Corrosion, D. Frazer, S. Qvist, S. Parker, D. L. Krumwiede *(Univ California, Berkeley)*, M. Caro, J. Tesmer, S. A. Maloy, Y. Q. Wang *(LANL)*, P. Hosemann *(Univ California, Berkeley)*

8:55 am: Irradiation-Induced Void Swelling in Pure Copper Characterized Using Transient Grating Spectroscopy, Cody A. Dennett *(MIT)*, Akihiro Kushima *(MIT, Univ Central Florida)*, Kangpyo So *(MIT)*, Khalid Hattar *(SNL)*, Michael P. Short *(MIT)*

9:35 am: Quantitative Analysis of Localized Stresses in Irradiated Stainless Steel, D. C. Johnson, G. S. Was *(Univ Michigan)*

10:00 am: Selective Partitioning of Ruthenium from Nitric Acid Media, Jason M. Richards *(Univ Nevada, Las Vegas)*, Bruce J. Mincher *(INL)*

10:25 am: The Influence of Citrate and Oxalate on $^{99}Tc^{VII}$, Cs, Np^{V}, and U^{VI} Sorption to a Savannah River Site Soil, D. Montgomery, K. Barber, N. Edayilam *(Clemson Univ)*, K. Oqujiuba, S. Young, T. Biotidara, A. Gathers, M. Danjaji *(South Carolina State Univ)*, N. Tharayil, N. Martinez, B. Powell *(Clemson Univ)*

Nuclear Installations Safety: General—II

Sponsored by: NISD
Session Organizer and Chair: Nicholas R. Brown *(Penn State)*
Location: Coolidge **Time:** 8:00-10:50 am

8:05 am: Support for Reactor Operators in Case of Cyber-Security Threats, Carol Smidts, Yunfei Zhao, Xiaoxu Diao *(Ohio State)*, Indrajit Ray *(Colorado State)*, Jason Hollern *(AREVA)*, Quanyan Zhu *(New York Univ)*, Timothy McJunkin *(INL)*

8:30 am: Study on Diversity Actuation Signal of DAS for ACP100, Dan Zhang, Zhi-fang Qiu, Jian Deng *(Nuclear Power Inst. China)*

8:55 am: Establishment of Control Room Habitability Analysis Methodology Postulated the Event of Pressurized Tank/System of Hazardous Gas Release, Anjun Jiao, Dennis R. Blakely, Gregory L. Michael *(David-Besse Nuclear Power Plant)*

9:35 am: Experimental Evaluation of the Reliability of Digitalized Reactor Protection System, Jeongil Seo, Seung Jun Lee *(Ulsan Inst. Sci. Technol.)*

10:00 am: Test Stand Development to Assess the Performance of Ceramic Media Filters to Develop Section FO of ASME AG-1, Andrew L. Schemmel, Heejin Cho, Charles Waggoner *(Mississippi State)*

10:25 am: A New Passive Residual Heat Remove System Based on the TPCLT, Xing Lv, Minjun Peng, Genglei Xia *(Harbin Eng Univ)*

Reactor Physics Design, Validation, and Operational Experience—I

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Luiz Leal *(IRSN)*
Location: Harding **Time:** 8:00-10:50 am

8:05 am: Initial Core Design of CANDLE Burning Fast Reactor Using Plutonium from LWR Spent Fuel, Hiroki Osato, Jun Nishiyama, Toru Obara *(Tokyo Inst. Technol.)*

8:30 am: Effect of Compensating for Fuel Losses in Melt and Refining Process for Small CANDLE Reactor, Van Khanh Hoang, Jun Nishiyama, Toru Obara *(Tokyo Inst. Technol.)*

8:55 am: Verification and Validation of SuperMC with BEAVRS Benchmark, Guomin Sun, Zhiyan Wang, Bin Wu, Lijuan Hao, Jing Song, FDS Team *(Inst. Nuclear Energy Safety Technol.)*

9:35 am: Lessons Learned from Evaluation of Indirect Measurements for IRPhEP, Evgeny Ivanov *(IRSN)*

10:00 am: Neutronic Consequences for Parameters Perturbation at the Jordanian Subcritical Assembly, A. Alsabbagh, M. Al-Dbissi, E. Smadi, L. Khalayleh *(Jordan Univ Sci. Technol.)*

10:25 am: The Knowledge Preservation Program for Fast Flux Test Facility Data, D. W. Wootan, R. P. Omberg *(PNNL)*, C. Grandy *(ANL)*

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Fuel Cycle and Waste Management: General

Sponsored by: FCWMD
Session Organizer and Chair: Jared A. Johnson *(ORNL)*
Location: Delaware A **Time:** 1:00-3:50 pm

1:05 pm: Mechanical Decladding of Irradiated FFTF Mixed Oxide Fuel Rods, James A. King, Timothy J. Malewitz, Skyler M. James, Brian D. Simmons *(INL)*

1:30 pm: Feasibility Study on Determining Multiplicity of a Neutron Source Using JCC-71 Detectors in MCNP6, O. Dim, S. K. Aghara *(Univ Mass., Lowell)*, M. F. Villani *(Mirion Technologies (Canberra))*, R. Homan *(Univ Mass., Lowell)*

1:55 pm Spectroscopic Speciation Studies on the Actinide Lanthanide SEParation Process (ALSEP), Gabriela A. Picayo, Mark P. Jensen *(Colorado School of Mines)*

2:20 pm: A Mass-Transfer Model for the Adsorption of Iodine and Krypton on Engelhard Titanosilicate-10 Supported Carbon Nano-Polyhedrons, Kai Coldsnow, Sachin U. Nandanwar, Vivek Utgikar *(Univ Idaho),* Piyush Sabharwall *(INL)*

3:00 pm: An Analysis of a Hypothetical Release of Cesium-137 from a Spent Fuel Pool Fire at Kori-3 in South Korea, Jungmin Kang, Bemnet Alemayehu, Matthew McKinzie *(Natural Resources Defense Council)*, Michael Schoeppner *(Princeton)*

3:25 pm: Characterization of Microbial Survival in Radioactive 14C Spiked Salts of Graphite Moderated Nuclear Reactors, Gopolang Ashy Pete *(DOE South Africa)*, Manny Mathuthu *(North-West Univ)*

Materials Aging in Nuclear Fuel Storage (aging fuels management, cask degradation etc.) and Advanced Manufacturing

Sponsored by: MSTD
Session Organizer and Chair: Leo S. Fifield *(PNNL)*
Location: Virginia A **Time:** 1:00-2:20 pm

1:05 pm: CISCC of Stainless Steel Under Natural Deliquescence of Salt/Dust Mixtures, Kathryn E. Metzger, Kellie N. Hair, Andrew J. Duncan, Michael J. Martinez-Rodriguez, Brenda L. Garcia-Diaz *(SRNL)*

1:30 pm: Advanced Manufacturing of Metallic Fuels and Cladding Materials Using ECAP, Ryan Carnahan, Andrew Hoffman *(Idaho State)*, Haiming Wen *(Idaho State, INL)*

1:55 pm: Manufacturing Science and Improvements for Plasma Sprayed Zr Barrier Coatings on U-10Mo Foils, Dustin R. Cummins, Kendall J. Hollis, David E. Dombrowski *(LANL)*

Specialty Fuel for Space/Defense Reactors: Discussion On Performance Specifications and Nonproliferation Policy–Panel

Sponsored by: NNPD **Cosponsored by:** NCSD
Session Organizer and Chair: Ross Christopher Robinson *(Y-12 NSC)*
Location: Virginia B **Time:** 1:00-4:15 pm

With the current interest/progress in both space-nuclear power/propulsion and special purpose military systems, discussions continue regarding the boutique fuel used by these systems (e.g., highly enriched uranium (HEU) versus low-enriched uranium (LEU) fuel). For these high-power systems, low "specific mass" (i.e., kg/kWe) and the neutron flux density required are typically the most important fuel parameters. This panel is intended to bring together policy makers, technical/reactor design experts, program leads, and end-users for an open discussion on the technical challenges and ability to meet design/performance specifications and nuclear nonproliferation policies.

Panelists
D. V. Rao *(LANL)*
Michael G. Houts *(NASA MSFC)*
David K. Hayes *(LANL)*
Frank N. Sage *(White Sands Missile Range)*
John Miller *(SNL)*
John D. Bess *(INL)*

Technical Sessions: Thursday November 2

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Reactor Physics Design, Validation, and Operational Experience—II

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Luiz Leal *(IRSN)*
Location: Maryland B **Time:** 1:00-3:50 pm

1:05 pm: ZPR Core Representativity of SFR Reactivity Effects During Core Meltdown, Marat Margulis, Patrick Blaise, Laurent Buiron *(CEA)*, Erez Gilad *(Ben-Gurion Univ)*

1:30 pm: Application of MSHIM Base Load in Core Simulator of COSINE Project, Wenjing Han, Guoping Quan, Changhui Wang, Danyi Zhang, Su Wang, Hui Yu, Yixue Chen *(State Nuclear Power Software Development Center)*

1:55 pm: Research of Core Power Distribution Reconstruction Method by Disturbances Searching, Zhiheng Xue, Zhihong Liu, Jian Jia, Jing Zhao *(Tsinghua Univ)*

2:20 pm: A Core Design of Breeding BWR, Rui Guo *(Nuclear Power Inst. China, Waseda Univ)*, Akifumi Yamaji *(Waseda Univ)*, Xue Qin, Wenhao Ji, Zhumin Jiang, Shuai Wang, Yun Cai *(Nuclear Power Inst. China)*

3:00 pm: Analysis of Power Peaking Phenomena in Mixed-Spectrum Reactors, Abdalla Abou-Jaoude, Anna Erickson *(Georgia Tech)*

3:25 pm: Selected VERA Core Physics Benchmarks in OpenMC, Travis J. Labossiere-Hickman, Benoit Forget *(MIT)*

Severe Accident Modeling and Experiments for Light Water Reactors

Sponsored by: THD
Session Organizer: Robert P. Martin *(BWX Technologies)*
Chair: Hongbin Zhang *(INL)*
Location: Washington 2 **Time:** 1:00-3:25 pm

1:05 pm: Sensitivity Analysis of Water Pool Depth and Mixing Time for Ex-Vessel Fuel-Coolant Interaction(FCI) Steam Explosion Simulation, Jun Wang, Michael L. Corradini, Hangjin Jo *(Univ Wisconsin, Madison)*

1:30 pm: A Two-Phase Analytical Model for Terry Turbine Nozzle, Haihua Zhao, James E. O'Brien *(INL)*

1:55 pm: Flow Characteristics of Water Cooling Type Core Catcher Under Air-Water Single Channel Conditions, Takahisa Matsuzaki, Yoshihiko Ishii, Takeshi Sakai, Tadashi Fujii *(Hitachi Ltd.)*

2:20 pm: Estimation of Likely Accident Progression at Fukushima Daiichi Unit 2, Gen Li, Jun Zhang, Junjie Yan *(Xi'an Jiaotong Univ)*

3:00 pm: Code Analysis on Experiments for Steam Explosion in Various Water Levels, Sang Ho Kim, Seong-Wan Hong, Rae-Joon Park *(KAERI)*

Advanced Technologies and Analyses for Nuclear Reactors, Fusion Systems and Accelerator Applications—II

Sponsored by: AAD **Cosponsored by:** FED
Session Organizer: Peter Hosemann *(Univ California, Berkeley)*
Chair: Keith R. Rule *(PPPL)*
Location: Washington 3 **Time:** 1:00-2:45 pm

1:05 pm: In Situ Ion Irradiation on Al-Co-Cr-Fe-Ni High Entropy Alloys, Jing Hu *(ANL)*, Rui Feng, Peter Liaw *(Univ Tenn., Knoxville)*, Meimei Li, Mark Kirk *(ANL)*

1:30 pm: Photo-Neutron Source Designed for BNCT Based on RMC Code, Zifan Zhao, Hao Li, Ganglin Yu, Kan Wang *(Tsinghua Univ)*

1:55 pm: Study on the Technology of Electron Beam Permanent Magnet Spread System, Jiang Huang, Mingwu Fan, Tiaoqin Yu, Yongqian Xiong, Jun Yang *(Huazhong Univ)*

2:20 pm: Commercial Applications of High-Yield Accelerator-Based Neutron Generators, Ross Radel *(Phoenix Nuclear Labs)*

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

U.S. Environmental Protection Agency Superfund Radiation Risk Assessment Calculator Training—II–Tutorial

Sponsored by: DESD
Session Organizer and Chair: Stuart A. Walker *(EPA)*
Location: Washington 4 **Time:** 1:00-4:15 pm

U.S. EPA Superfund Radiation Risk Assessment is a full-day advanced course that focuses on specific technical and regulatory issues that site managers (e.g., RPMs, OSCs) and technical staff address when managing sites under the U.S. Environmental Protection Agency's Superfund remedial program that have a risk assessment conducted for radioactive contaminants. By taking the course, participants achieve the following objectives:

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The instructional methodology for this course includes lectures and demonstrations of using EPA's risk and dose assessment calculators developed by the Superfund remedial program. Please bring your LAPTOP to this training!!!

The target audience for this course is site managers, risk assessors and others that want to obtain a working knowledge on conducting Superfund radiation risk assessments.

- Stuart Walker, EPA Office of Superfund Remediation and Technology Innovation (Instructor)

Outline of Training

1. How Radiation Fits in Superfund
2. Radiation Risk Assessment
3. Radiation Risk Assessment Video and Community Toolkit
4. PRG Calculator
5. DCC Calculator
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Modules 3 and 4 provide a quick tutorial on using the PRG calculator and a hypothetical site example of using the PRG calculator "Decontamination and Decommissioning of Radiologically-Contaminated Facilities" https://clu-in.org/conf/itrc/radsdd_040308/ Module provides a quick tutorial on using the BPRG and SPRG calculator.

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This is a background resource that goes over the type of material that this course will cover and is a good support for what will be covered in the class.

For general information contact Stuart Walker by telephone at 703-603-8748 or via e-mail at walker.stuart@epa.gov

Highlights from PSA 2017–Panel

Sponsored by: NISD
Session Organizer and Chair: Andrea Maioli *(Westinghouse)*
Location: Coolidge **Time:** 1:00-4:15 pm

This session will feature a panel of speakers to present the highlights from PSA 2017 which was held September 24-28, 2017 in Pittsburgh, PA.

Panelists:
A. Maioli *(Westinghouse)*
Z. Mohaghegh *(Univ Illinois)*
N. Siu *(NRC)*
M. Modarres *(Maryland Univ)*

Technical Sessions: Thursday November 2

THURSDAY, NOVEMBER 2

TECHNICAL SESSIONS – 1:00 PM

All afternoon sessions feature a coffee break at 2:45 pm

Reactor Analysis Methods—III

Sponsored by: RPD
Session Organizer: Cristian Rabiti *(INL)*
Chair: Cole A. Gentry *(ORNL)*
Location: Harding **Time:** 1:00-3:50 pm

1:05 pm: Avoiding Calibration via a Non-Parametric Physics-Guided Coverage Mapping Algorithm, Jia Zhou, Hany S. Abdel-Khalik *(Purdue Univ)*

1:30 pm: Implementation and Validation of the HZP Homogenization Module in RMC, Gaochen Wu, Kan Wang *(Tsinghua Univ)*

1:55 pm: Depletion Rim Effect Incorporated in HIRE-Theoretic Multigroup Transport Equations, YuGwon Jo, Nam Zin Cho *(KAIST)*, Seungsu Yuk *(KAERI)*

2:20 pm: In-Situ Corrections of Two-Group Assembly Cross-Sections and Discontinuity Factors by the APEC Method, Woosong Kim, Yonghee Kim *(KAIST)*

3:00 pm: A "Discretization-Free" Fission Matrix Approach: The Galerkin Method on the Continuous Fission Kernel, Manuele Aufiero, Massimiliano Fratoni *(Univ California, Berkeley)*

3:25 pm: ROMUSE: Reduced Order Modeling Based Uncertainty/Sensitivity Estimator for Reactor Core Simulators, Bassam A. Khuwaileh, Brian J. Williams *(LANL)*, Paul J. Turinsky *(NCSU)*

Challenges and Opportunities with Accelerated Qualification of LWR ATF Cladding and Fuel Materials–Panel

Sponsored by: MSTD
Session Organizer: Gokul Vasudevamurthy *(General Atomics)*
Chair: Kenneth J. Geelhood *(PNNL)*
Location: Delaware B **Time:** 1:00-4:15 pm

In order to avoid Fukushima like events, the USDOE has invested heavily in research and development of accident tolerant fuel and cladding materials to replace problem prone zircaloy-uranium dioxide system. Currently three prime candidates for the cladding are under active consideration: silicon carbide composites, Iron-chromium-aluminum (FeCrAl) steels and surface modified zircaloy. In the fuel arena, uranium silicide is being pursued as a suitable replacement for uranium dioxide on account of its attractive thermal properties. Although the R&D in this field (including the installation of lead test assemblies) is proceeding as expected, there is an immediate need to start a dialogue among the major stake holders: materials developers, regulators and the utilities to chalk out the next steps involved in the qualification of these systems and ensure a smooth transition from laboratory scale to commercial scale deployment.

Panelists:
Kurt Terrani *(ORNL)*
Robert Lukes *(NRC)*
Edward Lahoda *(Westinghouse)*
Tina Back *(General Atomics)*
Russ Fawcett *(GNF)*
Jon Carmack *(INL)*
William Gassmann *(Exelon)*

SCALE/ORIGEN for Shielding Source Term Generation–Tutorial

Sponsored by: RPSD
Session Organizers: Germina Ilas *(ORNL)*, Robert B. Hayes *(NCSU)*
Chair: William Wieselquist *(ORNL)*
Location: Virginia C **Time:** 1:00-4:15 pm

The ORIGEN depletion and decay code in the SCALE Code System includes, in addition to isotopic evolution prediction, the capability to calculate neutron, photon, alpha, and beta decay emissions, commonly used as time-dependent source terms in shielding calculations. This tutorial will focus on generating source terms for arbitrary materials. Hands-on examples will be included on generating neutron and photon sources for irradiated fuel and activated structural components and feeding ORIGEN neutron and photon sources into a MAVRIC shielding calculation. The tutorial is open to all participants at the conference. Participants wishing to follow along with the tutorial should bring their own computer, have a valid license for SCALE 6.2.1 or the most recent version, and have this SCALE version installed on their computer. This tutorial will not include basic SCALE GUI usage or a broad overview of the ORIGEN input—for this, participants are encouraged to attend the companion session "SCALE/ORIGEN for Nuclear Nonproliferation and Safeguards Applications".

Embedded Topical Meeting

Embedded Topical Meeting: Young Professionals Congress

GENERAL CHAIR:
Brett D. Rampal

PROGRAM CHAIR:
Jitesh A. Kuntawala
Duke Energy

PROGRAM CHAIR:
Catherine M. Perego
Westinghouse

Young Professionals Congress Schedule at a Glance

SATURDAY, OCTOBER 28

7:30-8:45 AM
Continental Breakfast

8:45-9:00 AM
Opening Remarks

9:00-9:45 AM
Keynote Speaker: John Kotek

9:45-10:00 AM
BREAK

10:00-11:00 AM
Nuclear Policy

11:00 AM-12:00 PM
Nuclear Economics

12:00-1:30 PM
Luncheon

1:30-2:30 PM
Illuminating the Nuclear Industry: Young Professionals and Their Careers

National Labs: The Heart of Nuclear Research and Development

Getting that Faculty Position

2:30-2:45 PM
BREAK

2:45-3:45 PM
The Cacophony of Codes: Understanding the Landscape

Advanced Reactors

Regulatory Roles and Interfaces

3:45-4:00 PM
BREAK

4:00-5:00 PM
Nuclear Advocacy

Accomplish More with a Professional Society

Effective Communication

5:00-5:15 PM
BREAK

5:15-6:00 PM
Closing Keynote Speaker: Robert Coward and Closing Remarks

Embedded Topical: Young Professionals Congress

EMBEDDED TOPICAL: 2017 YOUNG PROFESSIONALS CONGRESS

OPENING PLENARY-8:45 AM

Keynote Speaker: John Kotek

Location: Lincoln 5 **Time:** 9:00-9:45 am

John is Vice President for Policy Development and Public Affairs at the Nuclear Energy Institute (NEI). His role puts him on the front lines as NEI embarks on a new direction to preserve, sustain, innovate, and thrive the nuclear industry domestically and internationally. Prior to joining NEI, John was Acting Assistant Secretary for the Office of Nuclear Energy at the U.S. Department of Energy (DOE), where he worked closely with lawmakers, industry partners, national labs, academia, and utilities to understand the challenges and develop solutions at federal level. John has also served as the staff director to the Blue Ribbon Commission on America's Nuclear Future, commissioned by former DOE Secretary Chu under President Obama's first term. John was also the 2002 ANS Seaborg Congressional Fellow, serving in the office of Senator Bingaman (D-NM), who was at the time Chairman of the Senate Energy and Natural Resources Committee.

Please join John's keynote address, which will focus on the current outlook for nuclear and the leadership required, especially from young professionals, to ensure a thriving industry in the future.

Speaker: John Kotek *(Vice President for Policy Development and Public Affairs, Nuclear Energy Institute)*

Nuclear Policy

Session Cochairs and Organizers: Tim Crook *(Transatomic)*, Alyse Scurlock *(Duke Energy)*
Location: Lincoln 5 **Time:** 10:00-11:00 am

Public policy plays a vital role in sustainability of the United States nuclear power industry. Individual states' energy policies, such as regulated or deregulated market structure, cooperation with life extension, and inclusion or exclusion of nuclear power in clean air or renewable energy portfolio standards, may mean life or death for many power plants in the near term. This session will begin with a brief overview of how nuclear fits into national energy policy, along with a broad look at the impacts of regulated vs deregulated markets before delving into case studies of a few states to compare actual policy impacts.

Panelists: Mike Twomey *(Entergy)*
Nick Thompson *(LANL)*
Steve Nesbit *(Duke)*

Nuclear Economics

Session Chair and Organizer: Jitesh Kuntawala *(Duke Energy)*
Location: Lincoln 5 **Time:** 11:00 am-12:00 pm

It is sometimes hard to understand the complex economic concerns that drive decision making in the nuclear industry. This session will feature panelists who will discuss various facets of the economics of the commercial nuclear power industry. Among other topics, the economic effects of decommissioning plants, current market conditions, and the economics of advanced nuclear energy will be discussed.

Panelists: Daniel Curtis *(MIT)*
Adam Dow *(MCR)*
Harsh S. Desai *(NEI, Energy Solutions, LLC)*
Matt Crozat *(NEI)*

TECHNICAL SESSIONS-1:30 PM

Illuminating the Nuclear Industry: Young Professionals and Their Careers

Session Cochairs and Organizers: Sarah Camba Lynn *(Luminant Power),* Matt Wargon *(SCE&G)*
Location: Lincoln 2 **Time:** 1:30-2:30 pm

Early in our careers we are often bombarded with differing advice for corporate advancement, work-life balance, and effective networking. Young professionals from various areas of the nuclear field will discuss what advice worked for them and share stories of how they built their careers. A subsequent question and answer session will give attendees the opportunity to engage the panelists and a look into their own futures.

Panelists: Christine Johnsen *(Duke Energy)*
Adam Dow *(MCR)*
Art Wharton *(Studsvik)*
Brett Rampal

EMBEDDED TOPICAL: 2017 YOUNG PROFESSIONALS CONGRESS

TECHNICAL SESSIONS-1:30 PM

National Labs: The Heart of Nuclear Research and Development

Session Chair and Organizer: Florent Heidet *(ANL)*
Location: Lincoln 3 **Time:** 1:30-2:30 pm

National Laboratories are at the heart of nuclear energy R&D. From developing new technologies and components for existing reactors, to developing the next generation of nuclear reactors, National Laboratories play a key role in the future of Nuclear Energy. Experts from several National Laboratories will discuss why they chose this path and share their current experience. This session is a great venue for those curious about National Laboratories or considering pursuing a career in R&D to ask questions directly to lab employees.

Panelists: Gerhard Strydom *(INL)*
Allison Miller *(SNL)*
Dave Pointer *(ORNL)*
Darius Lisowski *(ANL)*

Getting that Faculty Position

Session Chair and Organizer: Nick Thompson *(LANL)*
Location: Lincoln 4 **Time:** 1:30-2:30 pm

Many young professionals set their sights on entering academia and getting a coveted Tenure Track position. But sometimes, even getting an interview at a University can be a challenge as positions are limited and the field of candidates is very strong. This session will help young professionals get that position, by explaining what experience they need to be a top candidate for the position, giving advice on how to apply for positions, and some tips for interviewing at Universities.

Panelists: Brian Kiedrowski *(Univ Michigan)*
Jamie Coble *(UTK)*
Kyle Hartig *(UF)*

TECHNICAL SESSIONS-2:45 PM

The Cacophony of Codes: Understanding the Landscape

Session Chair and Organizer: Jitesh Kuntawala *(Duke Energy)*
Location: Lincoln 2 **Time:** 2:45-3:45 PM

The landscape of nuclear analysis codes and methods can often be difficult to navigate and populated by powerful, but isolated and restricted, analysis tools. However, unique applications have unique means and every code has a history and niche. Experts from across the facets of the nuclear world will discuss how they are working to make sense of what can be a confusing landscape and what other recent advances that have been made in nuclear analysis and simulation.

Panelists: Erin Wehlage *(Studsvik)*
Nick Touran *(TerraPower)*
Chris Perfetti *(ORNL)*
Paul Romano *(ANL)*

Advanced Reactors

Session Chair and Organizer: Piyush Sabharwall *(INL)*
Location: Lincoln 3 **Time:** 2:45-3:45 PM

The panel will focus on efforts to accelerate commercialization of small modular reactors and advanced reactors. The panelists will cover various key aspects: technical challenges, economics/energy market changes and deployment strategy.

Panelists: Piyush Sabharwall *(INL)*
Ashley Finan *(Clean Air Task Force)*
Daniel Carleton *(Terrestrial)*
Nick Smith *(Southern Co.)*

Regulatory Roles and Interfaces

Session Cochairs and Organizers: Steve Ward *(Enercon)*, Catherine Perego *(Westinghouse Electric Company)*
Location: Lincoln 4 **Time:** 2:45-3:45 PM

As companies seek to deploy new nuclear power plant designs and expand the nuclear sciences, a major hurdle is satisfying regulatory requirements. These requirements may differ depending on application and region; having a large impact on the overall process and any interfaces. Hear about differing interactions with regulatory organizations and how reactor vendors, utilities, government organizations and others address issues while meeting global nuclear safety standards.

Panelists: Jennie Winke *(NuScale Power)*
Marlayna Vaaler *(NRC)*
Janelle Eddins *(DOE)*
Jessica Krejcie *(Exelon)*

EMBEDDED TOPICAL: 2017 YOUNG PROFESSIONALS CONGRESS

TECHNICAL SESSIONS-4:00 PM

Nuclear Advocacy

Session Chair and Organizer: Kelsey Amundson *(DNFSB)*
Location: Lincoln 2 **Time:** 4:00-5:00 pm

Advocacy will play an important role in the modern nuclear industry. Experts will discuss their personal involvement in nuclear advocacy, how to engage with the public on nuclear issues, and what they see for the future of nuclear advocacy.

Panelists: Tay Stevenson *(Generation Atomic)*
Benjamin Reinke *(U.S. Congress)*
Emma Redfoot *(Students for Nuclear)*

Accomplish More with a Professional Society

Session Chair and Organizer: Brett Rampal
Location: Lincoln 3 **Time:** 4:00-5:00 pm

Professional societies and organizations offer otherwise unavailable leadership, educational, and career development opportunities to nuclear professionals at any point in their career. In this panel, current and former leaders within nuclear professional societies will discuss professional and personal successes that came from roles within a professional organization and how others might also achieve success.

Panelists: Natalie Wood *(Entergy)*
Carol Berrigan *(NEI)*
Denis Janin *(IYNC)*

Effective Communication

Session Cochairs and Organizers: Katherine Shields *(Univ California, Berkeley)*, Shana Bobbins *(Exelon)*
Location: Lincoln 4 **Time:** 4:00-5:00 pm

In the modern nuclear landscape, it is very important to develope the skills necessary to speak about nuclear to a variety of audiences, including the general public, youth, politicians, and other clean energy supporters. This session will feature a variety of perspectives on communication about nuclear, including industry expertise and current academic research on science and risk communication. Hear brief presentations from each expert, followed by a workshop-style period in which participants can ask questions of the experts and each other to identify best practices.

Panelists: Lenka Kollar *(NuScale Power)*
Laura Hermann *(PCG)*
Monica Beistline *(Exelon)*
JoAnna Wendel *(EOS.org)*

CLOSING REMARKS-5:15 PM

Closing Keynote Speaker: Nuclear Power Looking Forward: The Opportunity and the Implications

Location: Lincoln 5 **Time:** 5:15-6:00 pm

The energy markets are at a cross roads with significant disruption and serious questions regarding the direction forward. The role of nuclear power is a critical element of those decisions. This talk discusses the current situation, the opportunity in front of us, and the resulting implications as they relate to nuclear power in the US and worldwide.

Speaker: Bob Coward *(ANS President, Principal Officer of MPR Associates)*

Committee Meetings

NATIONAL COMMITTEES

Accreditation, Polices & Procedures
SUNDAY, 11 AM - 12 PM | PARK 8222

Board of Directors
- **Professional Division Reports**
  WEDNESDAY, 4 PM - 5:30 PM | MARRIOTT 3
- **ANS Board of Directors**
  THURSDAY, 7:30 AM - 3:30 PM | MARRIOTT 3

Bylaws & Rules
SUNDAY, 4 PM - 5:30 PM | VIRGINIA B

Communications
SUNDAY, 4 PM - 6 PM | WASHINGTON 5

Finance Meeting
TUESDAY, 2 PM - 6 PM | MADISON A

Honors & Awards
MONDAY, 4 PM - 6 PM | MADISON B

International
SUNDAY, 11:30 AM - 1:30 PM | WASHINGTON 1

Local Section Workshop
SUNDAY, 9 AM - 12 PM | VIRGINIA A

Membership
SUNDAY, 10 AM - 12 PM | HARDING

National Program
- **NPC Screening & International**
  SUNDAY, 10 AM - 12 PM | WILSON C
- **NPC National Meeting Sub Committee**
  WEDNESDAY, 11:30 AM - 1 PM | PARK 8228
- **NPC Program**
  WEDNESDAY, 4 PM - 7 PM | MADISON A

NEED
SUNDAY, 7:30 PM - 9:30 PM | PARK 8222

Planning Committee
SUNDAY, 2 PM - 4 PM | VIRGINIA B

President's Meeting w/Committee & Division Chairs
SUNDAY, 8 AM – 9:30 AM | DELAWARE A

Professional Development Coordination
TUESDAY, 4 PM – 5:30 PM | PARK 8228

Professional Divisions
- **Training Workshop**
  SATURDAY, 5 PM – 6:30 PM | JEFFERSON
- **Committee Meeting**
  TUESDAY, 4 PM – 5:30 PM | WILSON B

NATIONAL COMMITTEES

Professional Engineering Exam
- **PEEC Item Writers Group/Single Reference Handbook Review**
  SATURDAY, 5 PM – 10 PM | JACKSON
- **PEEC Single Reference Handbook Review**
  SUNDAY, 9 AM – 2 PM | MARYLAND C
- **PEEC Committee Meeting**
  SUNDAY, 4 PM – 6 PM | VIRGINIA C

Professional Women In ANS
MONDAY, 3 PM – 5 PM | PARK 8219

Public Policy
WEDNESDAY, 12:30 PM – 2:30 PM | MADISON A

Publications Steering
- **Meetings, Proceedings & Transactions**
  SUNDAY, 9 AM – 10 AM | VIRGINIA C
- **Book Publishing**
  SUNDAY, 11 AM – 12:30 PM | MARYLAND A
- **Nuclear News Editorial Advisory**
  SUNDAY, 4 PM – 5:30 PM | MARYLAND A
- **Technical Journals**
  SUNDAY, 1 PM – 4 PM | MARYLAND A
- **Nuclear Technology Editorial Advisory**
  SUNDAY, 4 PM – 5:30 PM | PARK 8209
- **Publications Steering Committee**
  MONDAY, 4:30 PM – 6:30 PM | PARK 8209

Scholarship Policy & Coordination
MONDAY, 12 PM – 1 PM | PARK 8219

Student Sections Committee
- **Executive**
  MONDAY, 6 PM – 7 PM | HARDING
- **Reports**
  MONDAY, 7 PM – 8 PM | HARDING

SPECIAL COMMITTEES

Special Committee on the Congressional Fellow Program
TUESDAY, 3:30 PM - 4:30 PM | PARK 8222

OTHER COMMITTEES

Christian Nuclear Fellowship
MONDAY, 7 PM – 8:30 PM | MADISON A

Christian Nuclear Fellowship Breakfast
WEDNESDAY, 7 AM – 8:30 AM | PARK 8219

International Nuclear Societies Council (INSC)
TUESDAY, 2:30 PM – 5:30 PM | PARK 8219

Committee Meetings

OTHER COMMITTEES

KNS – US Chapter Meeting
MONDAY, 5 PM – 7 PM | PARK 8228

Nuclear Pride LGBT Organization
TUESDAY, 12 PM – 1 PM | PARK 8219

NEDHO
SUNDAY, 4 PM – 6 PM | DELAWARE B

Pacific Nuclear Council
SUNDAY, 9 AM – 11 AM | PARK 8228

UWC Planning Committee
SUNDAY, 12 PM –1 PM | HARDING

DIVISION COMMITTEES

Accelerator Applications
Executive
MONDAY, 11:30 AM – 1:30 PM | PARK 8228

Aerospace Nuclear Science & Technology
SUNDAY, 12 PM – 1 PM | PARK 8219

Biology & Medicine
Executive
SUNDAY, 4 PM – 5:30 PM | PARK 8222

Decommissioning and Environmental Sciences
Program
SUNDAY, 3:30 PM – 4:30 PM | VIRGINIA A

Executive
SUNDAY, 4:30 PM – 5:30 PM | VIRGINIA A

Education, Training & Workforce Development
Program
SUNDAY, 10:30 AM – 12 PM | HOOVER

University/Industry/Government Relations
SUNDAY, 1:30 PM – 2 PM | HOOVER

Alpha Nu Sigma National Honor Society
SUNDAY, 1 PM – 2 PM | VIRGINIA A

Executive
SUNDAY, 2 PM – 4 PM | HOOVER

Membership/Honors & Awards
TUESDAY, 4 PM - 6PM | MADISON B

Fuel Cycle & Waste Management
Program
SUNDAY, 12 PM – 1 PM | WASHINGTON 5

Executive
SUNDAY, 1 PM – 2:30 PM | WASHINGTON 5

DIVISION COMMITTEES

Fusion Energy
Executive
TUESDAY, 6:45 PM – 8:45 PM | PARK 8228

Human Factors, Instrumentation, and Controls
Program
SUNDAY, 11 AM – 12 PM | WILSON A

Executive
SUNDAY, 12 PM – 2:30 PM | WILSON A

Isotopes and Radiation
Joint Program Committee-I&R/BM
SUNDAY, 1:30 PM – 2:30 PM | MARYLAND B

Executive
SUNDAY, 2:30 PM – 6 PM | MARYLAND B

Materials Science & Technology
Executive
MONDAY, 6:30 PM – 8:30 PM | MADISON B

Mathematics & Computation
Program
SUNDAY, 1 PM – 2 PM | PARK 8222

Executive
SUNDAY, 2 PM – 4 PM | PARK 8222

Nuclear Criticality Safety
Education Meeting
SUNDAY, 1 PM – 2 PM | WASHINGTON 3

Program
SUNDAY, 2 PM – 3 PM | WASHINGTON 3

Executive
SUNDAY, 3 PM – 4:30 PM | WASHINGTON 3

Communications
SUNDAY, 4:30 PM – 5:30 PM | WASHINGTON 3

Nuclear Installations Safety
Program
SUNDAY, 4 PM – 6 PM | HOOVER

Executive
MONDAY, 6 PM – 8 PM | PARK 8222

Nuclear Nonproliferation Policy
Program
SUNDAY, 2:30 PM – 3:30 PM | WILSON A

Executive
SUNDAY, 3:30 PM – 4:30 PM | WILSON A

Committee Meetings

DIVISION COMMITTEES

Operations & Power

Program
SUNDAY, 1:30 PM – 3 PM | HARDING

Executive
SUNDAY, 3:30 PM – 6 PM | HARDING

Radiation Protection & Shielding

Program
SUNDAY, 1 PM – 2 PM | COOLIDGE

Executive
SUNDAY, 2 PM – 4 PM | COOLIDGE

Standards Committee
SUNDAY, 4 PM - 5 PM | COOLIDGE

Reactor Physics

Goals & Planning
SUNDAY, 1 PM – 2 PM | WASHINGTON 2

Program
SUNDAY, 2 PM – 4 PM | WASHINGTON 2

Executive
SUNDAY, 4 PM – 6 PM | WASHINGTON 2

Robotics & Remote Systems

Executive
SUNDAY, 12 PM – 4 PM | PARK 8209

Thermal Hydraulics

Program
SUNDAY, 2:30 PM – 4:30 PM | MARYLAND C

Executive
SUNDAY, 4:30 PM – 6 PM | MARYLAND C

Young Members Group (TG)

Program
MONDAY, 11 AM - 12 PM | PARK 8222

Executive
MONDAY, 12:30 PM – 1:30 PM | PARK 8222

STANDARDS COMMITTEES

ANS-8.1
MONDAY, 3 PM – 5 PM | PARK 8228

ANS-8.12
TUESDAY, 7:30 AM –9:30 AM | PARK 8222

ANS-8.20
SUNDAY, 10 AM – 12 PM | PARK 8219

ANS-8.28
TUESDAY, 3 PM – 5 PM | PARK 8209

ANS-10
MONDAY, 5 PM – 6 PM | PARK 8222

ANS-10.4
MONDAY, 4 PM – 5 PM | PARK 8222

ANS-19
MONDAY, 9 AM – 10:30 AM | PARK 8228

ANS-19.3
MONDAY, 8 AM – 9 AM | PARK 8228

ANS-19.3.4
TUESDAY, 8:30 AM – 9:30 AM | PARK 8219

ANS-20.1
MONDAY, 5 PM – 7 PM | PARK 8219

ESCC
WEDNESDAY, 10 AM – 12:30 PM | WILSON A

LLWRCC
WEDNESDAY, 9 AM – 12 PM | WILSON B

NCSCC
MONDAY, 2:30 PM – 5 PM | WILSON A/B

NRNFCC
WEDNESDAY, 8 AM – 10 AM | WILSON A

RARCC
MONDAY, 11 AM – 12:30 PM | MADISON A

RP3C
MONDAY, 2:30 PM – 6 PM | MADISON A

SRACC
SUNDAY, 3 PM – 5 PM | MADISON A

Standards Board
TUESDAY, 8:30 AM – 5 PM | WILSON A

Committee/Division/Other Meetings Daily

Saturday, October 28

5:00 pm - 6:30 pm	Professional Divisions Committee-Workshop	Jefferson
5:00 pm - 10:00 pm	Professional Engineering Exam (PEEC) Item Writers Group/Single Reference Handbook Review	Jackson

Sunday, October 29

8:00 am - 9:30 am	President's Meeting with Committee & Division Chairs	Delaware A
9:00 am - 10:00 am	Publications Steering Committee-Meetings, Proceedings & Transactions Committee	Virginia C
9:00 am - 11:00 am	Pacific Nuclear Council	Park 8228
9:00 am - 12:00 pm	Local Section Workshop Committee	Virginia A
9:00 am - 2:00 pm	Professional Engineering Exam Committee (PEEC) Single Reference Handbook Review	Maryland C
10:00 am - 12:00 pm	ANS-8.20	Park 8219
10:00 am-12:00 pm	Membership Committee	Harding
10:00 am-12:00 pm	National Program Committee-NPC Screening	Wilson C
10:30 am -12:00 pm	Education, Training & Workforce Development Division-Program Committee	Hoover
11:00 am - 12:00 pm	Accreditation, Policies & Procedures	Park 8222
11:00 am - 12:00 pm	Human Factors, Instrumentation & Controls Division-Program Committee	Wilson A
11:00 am - 12:30 pm	Publication Steering Committee-Book Publishing	Maryland A
11:30 am - 1:30 pm	International Committee	Washington 1
12:00 pm - 1:00 pm	Fuel Cycle & Waste Management Division-Program Committee	Washington 5
12:00 pm - 1:00 pm	UWC Planning Committee	Harding
12:00 pm - 1:00 pm	Aerospace Nuclear Science & Technology Division – Executive Committee	Park 8219
12:00 pm - 2:30 pm	Human Factors, Instrumentation & Controls Division-Executive Committee	Wilson A
12:00 pm - 4:00 pm	Robotics & Remote Systems Division-Executive Committee	Park 8209
1:00 pm - 2:00 pm	Education, Training & Workforce Development Division-Alpha Nu Sigma National Honor Society	Virginia A
1:00 pm - 2:00 pm	Mathematics & Computation Division-Program Committee	Park 8222
1:00 pm - 2:00 pm	Nuclear Criticality Safety Division-Education Meeting	Washington 3
1:00 pm - 2:00 pm	Radiation Protection & Shielding Division-Program Committee	Coolidge
1:00 pm - 2:00 pm	Reactor Physics Division-Goals & Planning Committee	Washington 2
1:00 pm - 2:30 pm	Fuel Cycle & Waste Management Division-Executive Committee	Washington 5
1:00 pm - 4:00 pm	Publications Steering Committee-Technical Journals	Maryland A
1:30 pm - 2:30 pm	Isotopes & Radiation Division-Joint Program Committee-I&R/BM	Maryland B
1:30 pm - 2:00 pm	Education, Training & Workforce Development Division-University/Industry/ Government Relations Committee	Hoover
1:30 pm - 3:00 pm	Operations & Power Division-Program Committee	Harding
2:00 pm - 3:00 pm	Nuclear Criticality Safety Division - Program Committee	Washington 3
2:00 pm - 4:00 pm	Education Training & Workforce Development Division-Executive Committee	Hoover
2:00 pm - 4:00 pm	Mathematics & Computation Division-Executive Committee	Park 8222
2:00 pm - 4:00 pm	Planning Committee	Virginia B
2:00 pm - 4:00 pm	Radiation Protection & Shielding Division-Executive Committee	Coolidge
2:00 pm - 4:00 pm	Reactor Physics Division-Program Committee	Washington 2
2:30 pm - 3:30 pm	Nuclear Nonproliferation Policy Division-Program Committee	Wilson A
2:30 pm - 4:30 pm	Thermal Hydraulics Division-Program Committee	Maryland C
2:30 pm - 6:00 pm	Isotopes & Radiation Division-Executive Committee	Maryland B
3:00 pm - 4:30 pm	Nuclear Criticality Safety Division - Executive Committee	Washington 3
3:00 pm - 5:00 pm	SRACC	Madison A
3:30 pm - 4:30 pm	Decommissioning and Environmental Sciences Division-Program Committee	Virginia A
3:30 pm - 4:30 pm	Nuclear Nonproliferation Policy Division-Executive Committee	Wilson A
3:30 pm - 6:00 pm	Operations & Power Division-Executive Committee	Harding
4:00 pm - 5:00 pm	Radiation Protection & Shielding Division-Standards Committee	Coolidge
4:00 pm - 5:30 pm	Biology & Medicine Division – Executive Committee	Park 8222
4:00 pm - 5:30 pm	Bylaws & Rules Committee	Virginia B
4:00 pm - 5:30 pm	Publications Steering Committee-Nuclear News Editorial Advisory	Maryland A
4:00 pm - 5:30 pm	Publications Steering Committee-Nuclear Technology Editorial Advisory	Park 8209
4:00 pm - 6:00 pm	Communications Committee	Washington 5
4:00 pm - 6:00 pm	NEDHO	Delaware B
4:00 pm - 6:00 pm	Nuclear Installations Safety Division- Program Committee	Hoover
4:00 pm - 6:00 pm	Professional Engineering Exam Committee-Committee Meeting	Virginia C
4:00 pm - 6:00 pm	Reactor Physics Division-Executive Committee	Washington 2

Committee/Division/Other Meetings Daily

Sunday, October 29 Continued

4:30 pm - 5:30 pm	Decommissioning and Environmental Sciences Division-Executive Committee	Virginia A
4:30 pm - 5:30 pm	Nuclear Criticality Safety Division-Communications Committee	Washington 3
4:30 pm - 6:00 pm	Thermal Hydraulics Division-Executive Committee	Maryland C
7:30 pm - 9:30 pm	NEED Committee	Park 8222

Monday, October 30

8:00 am - 9:00 am	ANS-19.3	Park 8228
9:00 am -10:30 am	ANS-19	Park 8228
11:00 am - 12:00 pm	Young Members Group-Program Committee	Park 8222
11:00 am - 12:30 pm	RARCC	Madison A
11:30 am -1:30 pm	Accelerator Applications Division-Executive Committee	Park 8228
12:00 pm - 1:00 pm	Scholarship Policy & Coordination Committee	Park 8219
12:30 pm - 1:30 pm	Young Members Group-Executive Committee	Park 8222
2:30 pm - 5:00 pm	NCSCC	Wilson A/B
2:30 pm - 6:00 pm	RP3C	Madison A
3:00 pm - 5:00 pm	Professional Women In ANS Committee	Park 8219
3:00 pm - 5:00 pm	ANS-8.1	Park 8228
4:00 pm - 5:00 pm	ANS-10.4	Park 8222
4:00 pm - 6:00 pm	Honors & Awards Committee	Madison B
4:30 pm - 6:30 pm	Publications Steering Committee-Publications Steering Committee	Park 8209
5:00 pm - 6:00 pm	ANS-10	Park 8222
5:00 pm - 7:00 pm	ANS-20.1	Park 8219
5:00 pm - 7:00 pm	KNS – US Chapter Meeting	Park 8228
6:00 pm - 8:00 pm	Nuclear Installations Safety Division-Executive Committee	Park 8222
6:00 pm - 7:00 pm	Student Sections Committee-Executive Committee	Harding
6:30 pm - 8:30 pm	Materials Science & Technology Division-Executive Committee	Madison B
7:00 pm - 8:00 pm	Student Sections Committee-Reports	Harding
7:00 pm - 8:30 pm	Christian Nuclear Fellowship	Madison A

Tuesday, October 31

7:30 am - 9:30 am	ANS-8.12	Park 8222
8:30 am - 9:30 am	ANS-19.3.4	Park 8219
8:30 am - 5:00 pm	Standards Board	Wilson A
12:00 pm - 1:00 pm	Nuclear Pride LGBT Organization	Park 8219
2:00 pm - 6:00 pm	Finance Committee	Madison A
2:30 pm - 5:30 pm	International Nuclear Societies Council	Park 8219
3:00 pm - 5:00 pm	ANS-8.28	Park 8209
3:30 pm - 4:30 pm	Special Committee on the Congressional Fellow Program	Park 8222
4:00 pm - 5:30 pm	Professional Development Coordination Committee	Park 8228
4:00 pm - 5:30 pm	Professional Divisions Committee-Committee Meeting	Wilson B
4:00 pm - 6:00 pm	Education Training & Workforce Development Division-Membership/Honors & Awards	Madison B
6:45 pm - 8:45 pm	Fusion Energy Division-Executive Committee	Park 8228

Wednesday, November 1

7:00 am - 8:30 am	Christian Nuclear Fellowship Breakfast	Park 8219
8:00 am - 10:00 am	NRNFCC	Wilson A
9:00 am - 12:00 pm	LLWRCC	Wilson B
10:00 am - 12:30 pm	ESCC	Wilson A
11:30 am - 1:00 pm	National Program Committee-NPC National Meeting Subcommittee	Park 8228
12:30 pm - 2:30 pm	Public Policy Committee	Madison A
4:00 pm - 5:30 pm	Board of Directors - Professional Division Reports	Marriott 3
4:00 pm - 7:00 pm	National Program Committee - NPC Program	Madison A

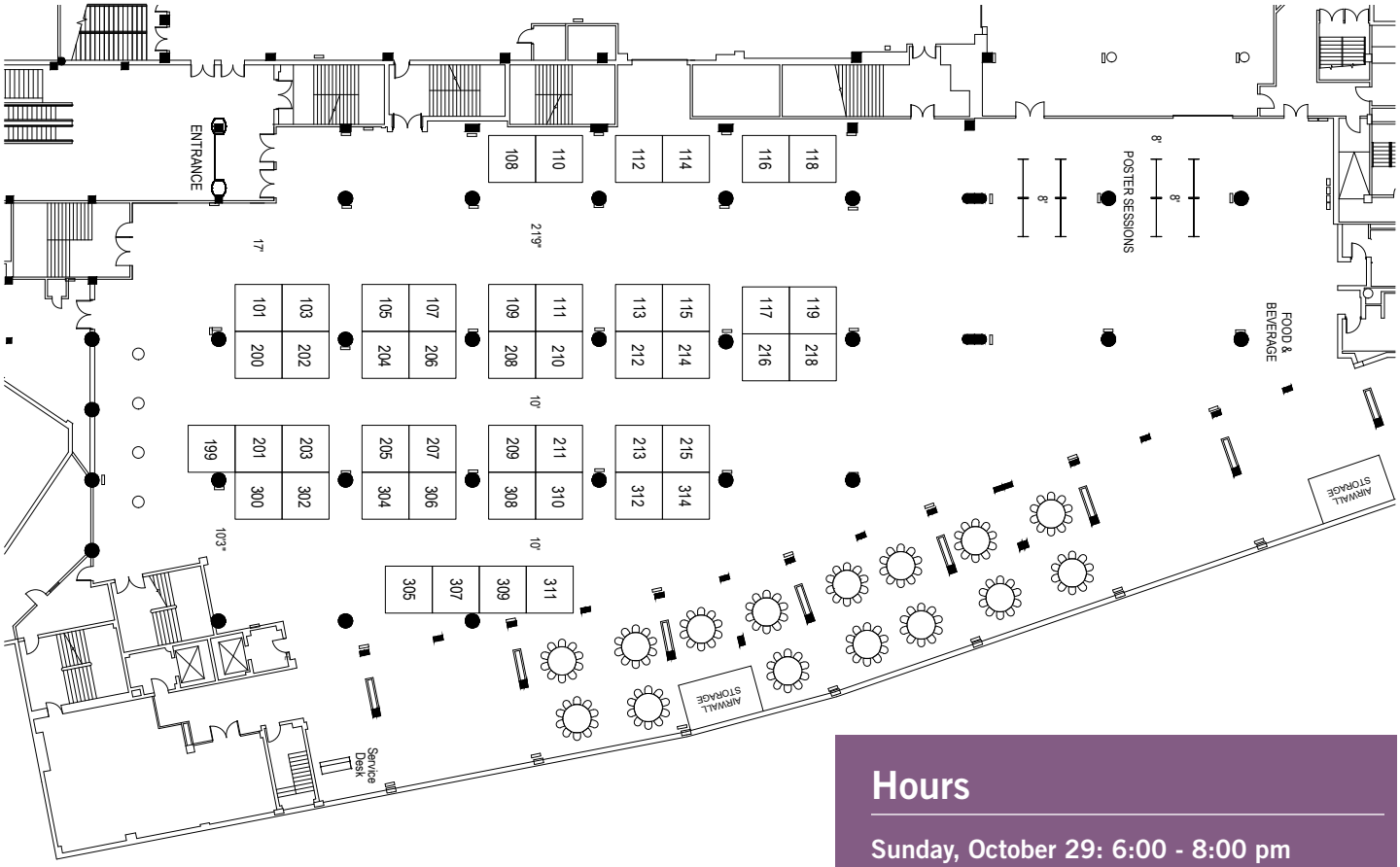
Thursday, November 2

7:30 am - 3:30 pm	ANS Board of Directors Meeting	Marriott 3

Exhibitors List

American Nuclear Society. . . . . Booths 199, 201 & 203
Argonne National Laboratory. . . . . .Booths 116 & 118
Bechtel. . . . . Booth 113
Canadian Nuclear Laboratories . . . . . Booth 305
Ceradyne, Inc., a 3M Company . . . . . Booth 312
Consortium for Nonproliferation Enabling Capabilities . Booth 214
GAIN - Gateway for Accelerated Innovation in Nuclear . Booth 309
General Atomics . . . . . Booth 107
IAEA Jobs - International Safeguards Project Office. . . Booth 115
Idaho National Laboratory -
Nuclear Science & Technology . . . . . Booth 311
Innovative Systems Software. . . . . Booth 218
Institute of Nuclear Energy Safety Technology
(INEST), Chinese Academy of Sciences . . . . . Booth 216
Light Water Reactor Sustainability Program . . . . . Booth 307
Los Alamos National Laboratory. . . . . Booth 117
Nuclear Energy University Program (NEUP) . . . . . Booth 310
The Nuclear Science User Facilities . . . . . Booth 308
Oak Ridge National Laboratory . . . . . Booth 108
OTEK Corporation . . . . . Booth 101
Taylor & Francis . . . . . Booth 109
Texas A&M Nuclear Engineering . . . . . Booth 111
University of Pittsburgh Swanson School
of Engineering-Nuclear Program . . . . . Booth 103
University of Tennessee Department of Nuclear
Engineering and Institute for Nuclear Security. . . . Booth 215
Varex Imaging . . . . . Booth 105
Virginia Commonwealth University . . . . . Booth 314
WSC, Inc. . . . . Booth 119

Exhibit Hall Floorplan



Hours

Sunday, October 29: 6:00 - 8:00 pm

Monday, October 30: 7:00 am - 5:00 pm

Tuesday, October 31: 7:00 am - 5:00 pm

Exhibitor Descriptions

American Nuclear Society
La Grange Park, IL (Booths 199, 201 & 203)

ANS, the premier international society serving nuclear professionals, promotes nuclear science and technology to benefit humanity. Visit our booth to learn what we offer individuals, organizations, vendors, and educators. Discover opportunities for collaboration and leadership, publications like *Nuclear News*, *Radwaste Solutions*, and technical journals, industry standards, and more. Explore the ANS Center for Nuclear Science and Technology Information's K-12 education and community outreach materials and initiatives. Or just stop by for a friendly chat with ANS staff.

Argonne National Laboratory
Lemont, IL (Booths 116 & 118)

Argonne National Laboratory continues to advance the science and technology foundations of safe, secure, and sustainable nuclear energy systems. Stop by the Argonne booth to learn more and register to win a piece of history – a block of CP-1 graphite! www.ne.anl.gov.

Bechtel
Reston, VA (Booth 113)

Bechtel has been a global leader in the engineering, procurement, and construction of nuclear power plants for more than 60 years. We use our expertise to help our government and private sector customers safely and effectively transform mission delivery across the facility lifecycle, from R&D to D&D.

Canadian Nuclear Laboratories
Ontario, Canada (Booth 305)

Canadian Nuclear Laboratories (CNL) is Canada's premier nuclear science and technology laboratory, dedicated to developing peaceful and innovative applications from nuclear technology through its expertise in physics, metallurgy, chemistry, biology, and engineering. We address global issues across the nuclear lifecycle and develop novel medical isotopes and devices.

Ceradyne, Inc., a 3M Company
Oakdale, MN (Booth 312)

Stable isotopes from Ceradyne, Inc., a 3M company have been helping the nuclear industry operate more efficiently and safely for nearly 30 years. From reactor criticality control to fuel and waste management, our neutron absorbing materials are helping to make nuclear power a safer and more affordable option for powering tomorrow's world. www.3m.com/boron

Consortium for Nonproliferation Enabling Capabilities
Raleigh, NC (Booth 214)

The Consortium for Nonproliferation Enabling Capabilities (CNEC) aims to create a preeminent research & education hub dedicated to the development of enabling technologies and technical talent for meeting the present and future grand challenges of nuclear nonproliferation.

GAIN - Gateway for Accelerated Innovation in Nuclear
Idaho Falls, ID (Booth 309)

DOE's Office of Nuclear Energy established the Gateway for Accelerated Innovation in Nuclear (GAIN), to make state-of-the-art research, development, and deployment infrastructure, regulatory expertise, and financial support available to the nuclear industry to optimize development of advanced nuclear energy technologies toward commercial readiness.

General Atomics
San Diego, CA (Booth 107)

General Atomics (GA) has been at the cutting edge of nuclear energy research and innovation since 1955. GA's revolutionary silicon carbide composites are the key to an Accident Tolerant Fuel that will greatly enhance fuel rod safety and durability, and improve plant economics and performance in both current and advanced reactors.

Exhibitor Descriptions

IAEA Jobs - International Safeguards Project Office (BNL)

Upton, NY (Booth 115)

The International Atomic Energy Agency (IAEA) in Vienna, Austria is the world's center for cooperation in the nuclear field committed to promoting safe, secure and peaceful uses of nuclear technology. The IAEA offers opportunities to engage meaningful issues of global peace, security and development while working in a multicultural environment.

Idaho National Laboratory - Nuclear Science & Technology

Idaho Falls, ID (Booth 311)

Idaho National Laboratory is the US lead laboratory for nuclear energy research, development, demonstration, and deployment. INL's Nuclear Science & Technology researchers work with unparalleled array of facilities for fabrication, irradiation, post-irradiation examination and modeling & simulation of fuels and materials for current light water and advanced nuclear reactor designs.

Innovative Systems Software

Ammon, ID (Booth 218)

Innovative Systems Software, LLC (ISS) a private, Limited Liability Company, is the developer of the RELAP/SCDAPSIM system thermal hydraulics and FUELSIM LWR fuel behavior codes. ISS manages the SCDAP Development and Training program (STDP), an international consortium of 90+ research, regulatory, and other organizations in 30 countries focused upon the development of improved reactor safety analysis and simulation technology. ISS provides technical support and training on thermal hydraulics and severe accident methods development & analysis.

Institute of Nuclear Energy Safety Technology (INEST), Chinese Academy of Sciences

Hefei, China (Booth 216)

Institute of Nuclear Energy Safety Technology (INEST), Chinese Academy of Sciences (CAS) is the professional institute focusing on basic research of nuclear energy safety and the supporting institution of Key Laboratory of Neutronics and Radiation Safety, CAS. It is also the independent nuclear safety assessment and evaluation center with the aim of promoting the sustainable development of nuclear science and technology.

Light Water Reactor Sustainability Program

Idaho Falls, ID (Booth 307)

The Light Water Reactor Sustainability (LWRS) Program is an R&D program sponsored by DOE with participation by NRC and the nuclear industry. LWRS leverages the extensive capabilities of DOE's national labs to provide the technical foundation for licensing and managing the long-term safe operation of existing nuclear power plants.

Los Alamos National Laboratory

Los Alamos, NM (Booth 117)

Los Alamos National Laboratory is a multi-disciplinary institution with over 10,000 employees located in Northern New Mexico. The Laboratory's mission is to solve national security challenges through scientific excellence. We have world-class capabilities in nuclear disciplines including theory, simulation, and experiments and are currently seeking qualified students, postdocs, and staff.

Nuclear Energy University Program (NEUP)

Idaho Falls, ID (Booth 310)

The Department of Energy's Office of Nuclear Energy (DOE-NE) created the Nuclear Energy University Program (NEUP) in 2009 to consolidate its university support under one program. NEUP plays a key role in helping DOE-NE accomplish its mission of leading the nation's investment in the development and exploration of advanced nuclear science and technology by funding nuclear energy research at U.S. colleges and universities and providing student education support.

The Nuclear Science User Facilities

Idaho Falls, ID (Booth 308)

Nuclear Science User Facilities merges the national nuclear research infrastructure with intellectual capital to pair the best ideas with the needed capability. Users are provided no-cost access to world-class nuclear research facilities, technical expertise from experienced scientists and engineers, and assistance with experiment design, assembly, safety analysis and examination.

Exhibitor Descriptions

Oak Ridge National Laboratory
Oak Ridge, TN (Booth 108)

Oak Ridge National Laboratory (ORNL) is a multi-program science and technology laboratory managed for the U.S. Department of Energy by UT-Battelle, LLC. Scientists and engineers at ORNL conduct basic and applied research and development to create scientific knowledge and technological solutions that strengthen the nation's leadership in key areas of science; increase the availability of clean, abundant energy; restore and protect the environment; and contribute to national security. www.ornl.gov

OTEK Corporation
Tucson, AZ (Booth 101)

Founded in 1974 by Dr. Otto P Fest, OTEK Corp. manufactures Process Measurement & Control Instruments from generic to Mil-Spec to Nuclear. The company holds several patents and many "Industry's First" products. OTEK's Appendix B program will allow it to help the Nuclear Industry modernize their controls rooms.

Taylor & Francis
Philadelphia, PA (Booth 109)

For two centuries, Taylor & Francis has been committed to the publication of scholarly research and now publishes a wide variety of journals and books. Stop by our booth to pick up your free sample copy today!

Texas A&M Nuclear Engineering
College Station, TX (Booth 111)

The Department of Nuclear Engineering at Texas A&M is the largest and one of the most diverse programs in the nation, with a long history of outstanding undergraduate and graduate education, strong research at the graduate level, and an unsurpassed commitment to professional and public service.

University of Pittsburgh Swanson School of Engineering-Nuclear Program
Pittsburgh, PA (Booth 103)

Consistently ranked as one of the top 25 public graduate engineering programs nationally by U.S. News and World Report, our live & online master's in engineering & certificate options offer you the ability to specialize in a number of areas critical to today's world including Nuclear Engineering. For information, please contact Stephanie Opalinski at sto24@pitt.edu.

University of Tennessee Department of Nuclear Engineering and Institute for Nuclear Security
Knoxville, TN (Booth 215)

The University of Tennessee (UT) Nuclear Engineering is one of the most prestigious programs in the United States. The UT Institute for Nuclear Security, in collaboration with Oak Ridge National Laboratory, the Y-12 National Security Complex, and Oak Ridge Associated Universities, is developing new multidisciplinary efforts for improving nuclear security globally.

Varex Imaging
Salt Lake City, UT (Booth 105)

Varex Imaging is a leading innovator, designer and manufacturer of X-ray imaging components - tubes, detectors and other image processing solutions, which are key components of X-ray imaging systems. With a 65+ year history of successful innovation, Varex's components are used in medical, industrial and security systems globally. Visit www.vareximaging.com.

Virginia Commonwealth University
Richmond, VA (Booth 314)

Virginia Commonwealth University (VCU) is Virginia's premier public research university, and currently the only university in Virginia to offer a full suite of degrees in nuclear engineering, including an ABET accredited BS, MS and PhD. VCU's nuclear engineering program currently enrolls 100 undergraduate and 110 graduate students. Join us in room Madison B on Tuesday Oct 31 at 7:00 pm and help us celebrate the 10th anniversary of VCU's nuclear engineering program!!

WSC, Inc.
Frederick, MD (Booth 119)

WSC is a simulation technology company committed to continually improving the capabilities of its advanced 3KEYSOFTWARE® Simulation Environment. The simulation technology, traditional used in full scope nuclear, fossil and process simulators is now used by Engineering and Control Companies to embed WSC's technology in their engineering processes. WSC has also partnered with educational institutes to develop 3KEYSTUDENT™ making state-of-the-art simulator learning available in classrooms or via the Internet.

ANS Organization Membership

The American Nuclear Society salutes our Organization Members as sharing in our mission to promote nuclear science and technology to benefit humanity.*

AFO Research Inc.
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Alphasource Inc.
Ameren Missouri-Callaway Energy Center
American Electric Power Service Corp.
American Nuclear Insurers
Applied Technical Services
AREVA Nuclear Power
Argonne National Laboratory
Arizona Public Service Co.
ATC Nuclear
Barnhart Nuclear Services
Bechtel Nuclear, Security, & Environmental
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Southern Nuclear Operating Co.
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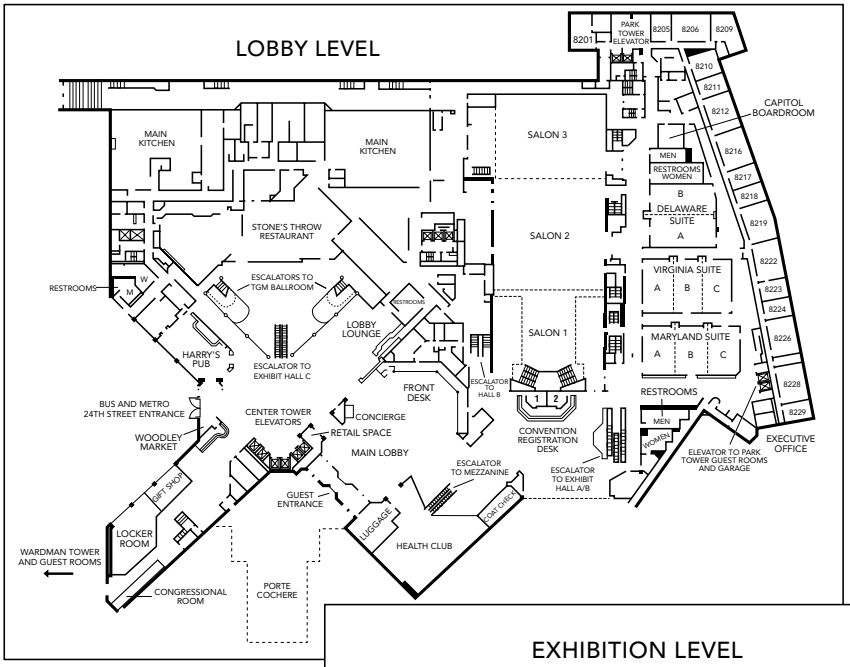
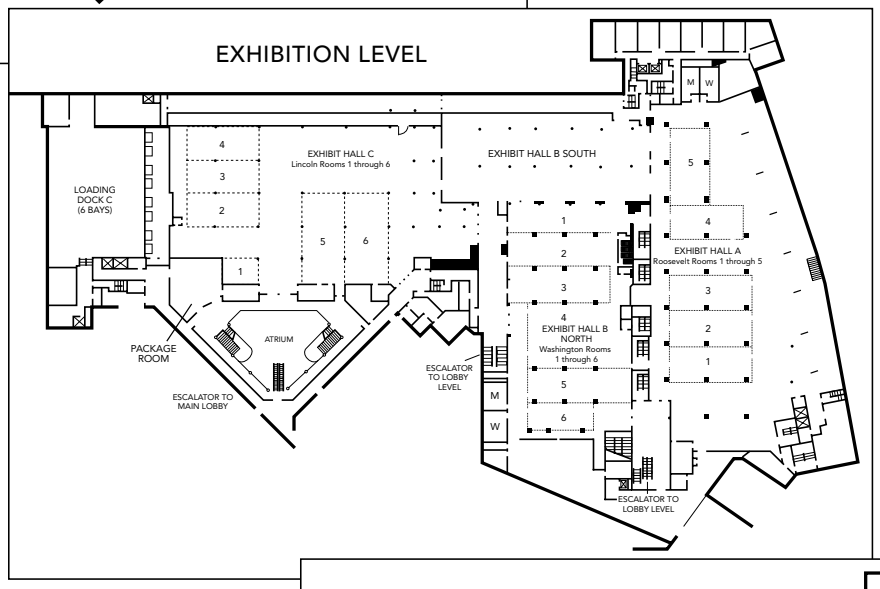
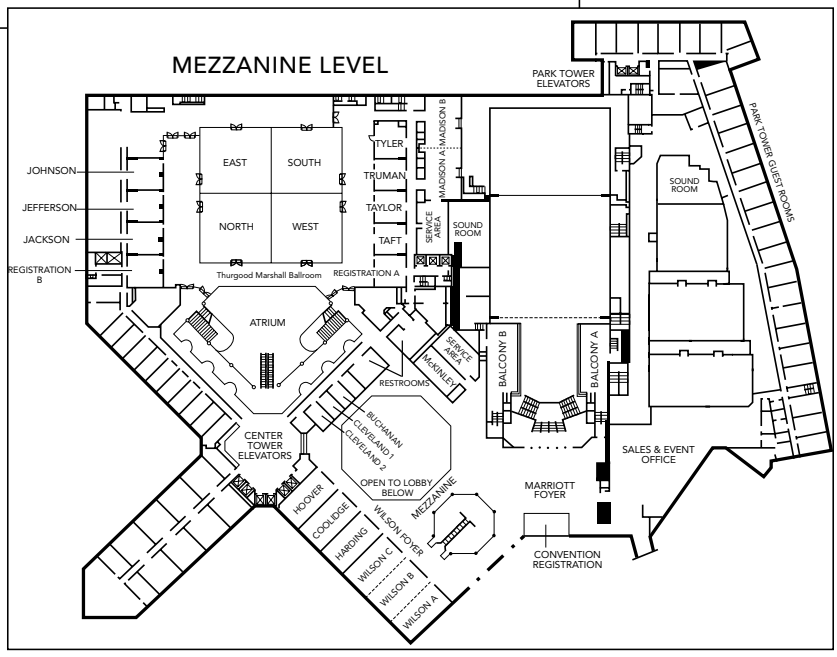
Hotel Floorplans



Marriott Wardman Park
2660 Woodley Road, NW,
Washington, D.C. 20008-4106





See you at future

ANS Winter Meetings

NOVEMBER 11-15, 2018
Hilton Orlando Bonnet Creek, Orlando FL

NOVEMBER 17-21, 2019
Marriott Wardman Park, Washington, D.C.

NOVEMBER 15-19, 2020
Chicago Marriott Downtown, Chicago IL

OCTOBER 31-NOVEMBER 4, 2021
Marriott Wardman Park, Washington, D.C.