



ANS Annual Meeting

2020

Preview Program

June 7-11, 2020
Arizona Grand Resort & Spa
Phoenix, AZ

Countdown to 2030

Framing the Nuclear Technology Agenda for the Next 10 Years



ANS

Annual Meeting 2020

Countdown to 2030:

Framing the Nuclear Technology Agenda for the Next 10 Years

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of the 2020 Annual Meeting.*

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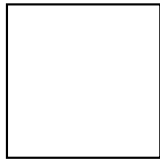
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Meeting Officials

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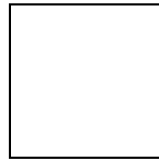
Framing the Nuclear Technology Agenda for the Next 10 Years

2020 Annual Meeting



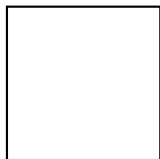
TECHNICAL PROGRAM CHAIR

Kevin O'Kula
Amentum Technical Services



ASSISTANT TECHNICAL PROGRAM CHAIR

Nicholas R. Brown
University of Tennessee, Knoxville



STUDENT PROGRAM COCHAIR

Lauren Crabtree
University of New Mexico



STUDENT PROGRAM COCHAIR

Bobbi Merryman
University of New Mexico

Daily Schedule

Sunday, June 7

7:00 am-7:00 pm	Registration
9:00 am-12:00 pm	ARMI Workshop Session 1
2:00-5:00 pm	ARMI Workshop Session 2
6:00-8:00 pm	ANS President's Opening Reception

Monday, June 8

7:00 am-5:00 pm	Registration
7:30-8:00 am	Continental Breakfast
8:00-10:30 am	Opening Plenary
10:30 am-1:00 pm	Lunch on Own
1:00-3:10 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Nuclear Installations Safety: General—I • Training, Human Performance and Workforce Development • Nuclear Energy's Role in Climate Change Policy • Waste Management and Fuel Cycle Innovation Challenges for Advanced Nuclear Reactors—Gen IV (Including International Perspectives)—Panel • Experimental Thermal Hydraulics—I • Accident Tolerant Fuels • Fuels and Materials for Molten Salt Reactors • Current Issues in Computational Methods—Roundtable • Reactor Physics: General • Data, Analysis, and Operations in Nuclear Criticality Safety—I
3:10-3:30 pm	Coffee Break
3:30-5:15 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Current Topics in Probabilistic Risk Analysis • Topics in Advanced Instrumentation • General Thermal Hydraulics • Characterization, Storage, and Transportation of Used Nuclear Fuel • Two-Phase Flow and Heat Transfer Fundamentals • Prospects for Blockchain Technology in International Security/Safeguards—Panel • Nuclear Science User Facilities and Fuels and Materials for Molten Salt Reactors • Leadership Styles & Management Techniques—Panel • Transformational Challenge Reactors—Panel • Review of Recent CSSG Activities—Panel
6:00-9:00 pm	OPD Honors & Awards Dinner

Daily Schedule

Tuesday, June 9

7:00 am-5:00 pm	Registration
7:30-8:00 am	Continental Breakfast
8:00-9:30 am	ANS President's Special Session
9:30-10:00 am	Coffee Break
10:00 am-12:10 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Nuclear Installations Safety: General—II • Communicating Safety & Risk to the Public—Panel • Work Force Development—Panel • Isotopes and Radiation: General • Computational Thermal Hydraulics • Radiation Protection and Shielding: General • In-Pile Testing of Nuclear Fuels and Materials • Transport Methods • Transformational Challenge Reactor • Sharing of Good Industry Practices and/or Lessons Learned in Nuclear Criticality Safety—Panel
12:10-1:30 pm	Lunch on Own
1:30-3:15 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Cyber Security for Nuclear Power Installations—I • Cutting Edge Techniques in Education, Training, and Distance Education • Thermal Hydraulics Activities for the Versatile Test Reactor • Fuel Storage and Transportation for the Next Generation of Reactors—Panel • Thermal Performance for Integrated Energy Systems: Design, Development, and Deployment—Panel • Computational Methods for Radiation Protection and Shielding • Advanced Manufacturing/Additive Manufacturing—I • Monte Carlo and Multiphysics • Reactor Analysis Methods—I • Pitch Your Job—Panel
3:15-3:35 pm	Coffee Break
3:35-5:20 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Cyber Security for Nuclear Power Installations—II • Focus on Communications—I—Panel • Focus on Communications—II—Panel • Critical Heat Flux Experiments—Accident Tolerant Fuels—Panel • Impacts of the Change in the Definition of High-Level Waste—Panel • Thermal Hydraulics Challenges and Research Opportunities in Licensing Advanced Reactor Designs—Panel • From CAD to Transport for Radiation Protection and Shielding Calculations—I • Advanced Manufacturing/Additive Manufacturing—II • Radiation Transport Software • Reactor Physics of Micro Reactors for Terrestrial and Space Applications—I • Innovating Nuclear through an Entrepreneurial Student Prize Competition—Panel

Daily Schedule

Wednesday, June 10

7:00 am-5:00 pm	Registration
7:30-8:00 am	Continental Breakfast
8:00-9:30 am	General Chair's Special Session
9:30-10:00 am	Coffee Break
10:00 am-12:10 pm	ANS Technical Sessions <ul style="list-style-type: none"> • General Topics in Instrumentation and Controls and Human Factors • General Topics in Decommissioning • Energy Storage Systems and Integration with NPPs—I • Chemical Treatment of Radioactive Waste • Challenges and Opportunities in Thermal Hydraulics of High Temperature Gas Cooled Reactors—Panel • Meeting the Challenges in Non-LWR PRA Standard Development—Panel • Sensors and In-Pile Instrumentation • Acceleration Methods • Reactor Physics of Advanced Reactors • Balancing Competition and National Needs in the Medical Isotopes Market—Panel
12:10-1:30 pm	Lunch on Own
1:30-3:15 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Online Monitoring and Prognostics • Resume/CV Workshop • Energy Storage Systems and Integration with NPPs—I • Lessons Learned from NNSA Consortias—Panel • Thermal Hydraulics of Nuclear Micro-Reactors and MSR • Managing Hydrogen Systems in Nuclear Facilities: Lessons Learned from the DOE Complex and Industry—Panel • Accelerated Materials Discovery • Aging of Materials • Reactor Physics of Micro Reactors for Terrestrial and Space Applications—II • ANS-8 Standards Forum
3:15-3:35 pm	Coffee Break
3:35-5:20 pm	ANS Technical Sessions <ul style="list-style-type: none"> • Digital Instrumentation and Control • Carbon Pricing and Clean Energy Standards 101—Panel • Operations and Power: General • Fuel Cycle and Waste Management: General • Computational Thermal Hydraulics—II • Uranium Mine Reclamation—Panel • Nuclear Fuels—I • Sensitivity, Uncertainty, and Machine Learning • Reactor Analysis Methods II • New Developments in Shipping Packages Related to Criticality Safety—Panel
5:45-7:00 pm	ANS Annual Business Meeting

Daily Schedule

Thursday, June 11

7:00-10:00 am	Registration
7:30-8:00 am	Continental Breakfast
7:30 am-3:00 pm	Technical Tour: Palo Verde
8:00-9:45 am	ANS Technical Sessions <ul style="list-style-type: none">• Experimental Thermal Hydraulics—II• ANS Position Statement on the Use of Low Enriched Uranium in Space—Panel• Nuclear Fuels—II• Robotics and Remote Systems: General• Reactor Analysis Methods—III• Data, Analysis, and Operations in Nuclear Criticality Safety—II
9:45-10:15 am	Coffee Break
10:15 am-12:00 pm	ANS Technical Sessions <ul style="list-style-type: none">• Nuclear Fuels—III• Reactor Physics Design, Validation, and Operational Experience• Data, Analysis, and Operations in Nuclear Criticality Safety—III



#ANSMeeting

General Information

MEETING INFORMATION

The American Nuclear Society is excited to invite you to join us in the valley of the sun, Phoenix, AZ from June 7-11 for the 2020 ANS Annual Meeting, which will be held at the Arizona Grand Resort & Spa.

In addition to an impressive list of government and industry leaders, we are also planning several outstanding hot-topic technical sessions and popular plenary speakers which will attract professionals from across the nation and internationally.

REGISTRATION

Location:

Name badges must be worn during all technical sessions and events. Some events require a ticket, and may entail an additional cost.

REGISTRATION HOURS

Sunday, June 7	7:00 am – 7:00 pm
Monday, June 8	7:00 am – 5:00 pm
Tuesday, June 9	7:00 am – 5:00 pm
Wednesday, June 10	7:00 am – 5:00 pm
Thursday, June 11	7:00 am – 10:00 am

NOTICE TO SPEAKERS

All speakers and session chairs must check in at the ANS Registration Desk.

ANS LOUNGE

Location:

Sunday-Wednesday: 7:30 am-5:00 pm
Thursday: 7:30 am-12:00 pm

ANS STUDENT OFFICE

Location:

Sunday-Wednesday: 8:00 am-5:00 pm
Thursday: 8:00 am-12:00 pm

ATTENDEE MEAL FUNCTIONS

Continental Breakfast & Breaks

Continental Breakfast, and morning and afternoon beverages and snacks will be provided to all registered meeting attendees, Monday-Thursday.

ANS President's Opening Reception

This reception is a ticketed event. (2) Drink tickets are included with a full meeting registration. Additional tickets are available for purchase at the following cost: \$75 (Adult)/\$25 (under 21).

General Information

HOTEL ACCOMMODATIONS

Arizona Grand Resort & Spa

8000 S. Arizona Grand Parkway Phoenix, Arizona 85044

Hotel Phone Number:

Room block pricing starts as low as \$179 (plus 12.57 % tax) a night. Call 877 800 4888 to speak directly with a Arizona Grand representative. Please advise you are with ANS or ANS Annual Meeting and you will be extended the prevailing rate. For additional questions, please contact the ANS meetings department at meetings@ans.org. Check-in: 4 pm Check-out: 11 am

Reservation Link:

To receive the group rate, your reservation may be booked through the ANS Official Housing Link: visit ansannual.org/hotelground/ and click on **“Reserve Your Room Here!”** On the same page there is also a government rate link available by clicking on **“For a Government rate, Reserve Your Room Now!”**

RESORT FEE – There is a discounted \$20 Resort fee per room, per night (Booking outside the block will result in \$50 resort fee). Resort fee includes:

- Standard high-speed wireless Internet access In Suite
- Oasis Water Park (6) Wristbands
- Athletic Club admittance (must be at least 16 years old to utilize facility)
- Valet and overnight parking
- In-suite coffee provided daily
- USA Today newspaper upon request
- Shuttle service to Arizona Mills Mall
- Unlimited credit card, toll-free, local and collect phone calls

MESSAGE TO ATTENDEES

ANS has made every effort to secure the best possible nightly room rate for you at the Arizona Grand Resort & Spa. That rate results from a negotiated overall package of event needs including but not limited to: sleeping rooms, meeting room space and other requirements.

Please help ANS keep the costs of this event as low as possible by booking your housing needs at the host hotel and through the reservation process created by ANS. Reserving your rooms elsewhere means you are booking outside the contracted room block, jeopardizing ANS's ability to meet its contracted obligations. Unfortunately if this happens, event costs will continue to increase if ANS falls short of its minimum room block guarantee. ANS appreciates your support and understanding of this important issue. Thank you!

TRAVEL INFORMATION

Airport: Phoenix Sky Harbor International Airport (PHX) is located 7 miles from the hotel

Overnight parking is included in the resort fee.

There are several ways to navigate the city, including **public transportation** and **transportation services** such as taxis, rental cars, charter services and ride-hailing services such as Uber, Lyft, and zTrip.

The **Valley Metro Rail** runs from central Phoenix, through downtown, to Tempe and Mesa in the east. Stations are close by and run right by some of the area's top attractions, such as the Heard Museum, Phoenix Art Museum, 8 Arizona Science Center, Chase Field, Talking Stick Resort Arena, Arizona State University and more.

General Information

OTHER THINGS TO ATTEND

Information Session on Nuclear Engineering PE Exam Module Program

Tuesday: 10:00 am-12:00 pm

This session will introduce ANS's new nuclear PE exam module program. The program is for individuals who have passed the Fundamentals of Engineering (FE) Exam (formerly the EIT exam) and who are preparing for the Principles and Practice of Engineering Exam (PE exam) in Nuclear Engineering. One of the developers of the module program will host the session. The module program consists of more than 50 brief online modules spanning the exam's four specification areas (nuclear power systems, nuclear fuel cycle, interaction of radiation with matter, and nuclear criticality/kinetics/neutronics). Examples of the modules will be presented during the session, along with an overview of the program. Questions from the audience will be answered. Exam takers will be instructed how to purchase some or all of the modules (when available) to use as a self-paced refresher course to help pass the nuclear PE exam in October.

First-Time Attendee Orientation

Sunday: 12:30-1:30 pm

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.

Student Program Q&A Meeting

Sunday: 4:00-5:00 pm

All students participating in the Student Program are encouraged to attend this brief informative meeting. Learn the basic operation of the Program and get your questions answered.

Attention Runners: ANS Fun Run

Tuesday: 6:00 am

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 running 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.

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 complete Respectful Behavior Policy can be found at www.ans.org/about/rbp.

Consent to Use Photographs and Videos: All attendance of registered participants, attendees, exhibitors, sponsors and guests ("you") at American Nuclear Society ("ANS") meetings, courses, conventions, conferences, or related activities ("Events") constitutes an agreement between you and ANS regarding the use and distribution of your image, including but not limited to your name, voice and likeness ("Image"). By attending the ANS Events, you acknowledge and agree that photographs, videotaping, live feed video and audio, and/or audio recordings may be taken of you and you grant ANS the right to use, in perpetuity, your Image in any electronic or print distribution, or by other means hereinafter created, both now and in the future, for media, art, entertainment, promotional, marketing, advertising, trade, internal use, educational purposes or any other lawful purpose.

General Information

ANS CODE OF ETHICS

Preamble

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.

Fundamental Principle

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.

ANS members shall subscribe to the following practices of professional conduct:

Principles of Professional Conduct

1. We hold paramount the safety, health, and welfare of the public and fellow workers, work to protect the environment, and strive to comply with the principles of sustainable development in the performance of our professional duties.
2. We will formally advise our employers, clients, or any appropriate authority and, if warranted, consider further disclosure, if and when we perceive that pursuit of our professional duties might have adverse consequences for the present or future public and fellow worker health and safety or the environment.
3. We act in accordance with all applicable laws and these Practices, lend support to others who strive to do likewise, and report violations to appropriate authorities.
4. We perform only those services that we are qualified by training or experience to perform, and provide full disclosure of our qualifications.
5. We present all data and claims, with their bases, truthfully, and are honest and truthful in all aspects of our professional activities. We issue public statements and make presentations on professional matters in an objective and truthful manner.
6. We continue our professional development and maintain an ethical commitment throughout our careers, encourage similar actions by our colleagues, and provide opportunities for the professional and ethical training of those persons under our supervision.
7. We act in a professional and ethical manner towards each employer or client and act as faithful agents or trustees, disclosing nothing of a proprietary nature concerning the business affairs or technical processes of any present or former client or employer without specific consent, unless necessary to abide by other provisions of this Code or applicable laws.
8. We disclose to affected parties, known or potential conflicts of interest or other circumstances, which might influence, or appear to influence, our judgment or impair the fairness or quality of our performance.
9. We treat all persons fairly.
10. We build our professional reputation on the merit of our services, do not compete unfairly with others, and avoid injuring others, their property, reputation, or employment.
11. We reject bribery and coercion in all their forms.
12. We accept responsibility for our actions; are open to and acknowledge criticism of our work; offer honest criticism of the work of others; properly credit the contributions of others; and do not accept credit for work not our own.

Plenary, Special Sessions and Events

SUNDAY, JUNE 7

ANS President's Opening Reception

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: \$75 (Adult)/\$25 (under 21).

ARMI Workshop

Session 1: 9:00 am-12:00 pm • Session 2: 2:00-5:00 pm

TerraPower will be providing two interactive workshops describing and demonstrating a newly-released open source nuclear engineering analysis automation tool. This software system, called ARMI, creates a digital “reactor at your fingertips”, enabling new levels of productivity, detail, and quality for engineers studying or evaluating nuclear reactors.

TerraPower has used ARMI with their internal set of physics plug-ins for over a decade to automate the entire analysis chain of various fast reactor core analyses. They can now have a supercomputer adjust the cladding thickness in a fuel pin in a statistical distribution and have an entire equilibrium fuel cycle analysis with loosely (or tightly) coupled thermal hydraulics and fuel performance be performed. Levelized cost of electricity and transient performance in a series of design-basis accidents are evaluated and functionalized. This enables robust and deep multi-objective optimization considering the entire system with a very small and efficient engineering team. The overall system at TerraPower integrates third party codes (like ANL's fast reactor suite) with internal physics tools (e.g. for depletion, equilibrium fuel cycle, flux reconstruction, subchannel T/H, core mechanical, fuel performance, etc.)

TerraPower decided to open-source the framework behind its storied automation capabilities as a way to increase collaboration and efficiency in the nuclear industry. We believe that by opening up these tens of thousands of lines of nuclear-specific data model, automation, data persistence, optimization, and utility code, we can push the “commodity” parts of the envelope together.

We hope that the community will begin to create plug-ins connecting ARMI to the wide and rich variety of physics kernels in use today. To start, we will open-source a few of our own and offer others with proprietary licenses. We believe that the open-source model of data management will foster a continuously improving ecosystem of interoperable reactor analysis software. Once we build a “critical mass”, the value of connecting your specialized tool to ARMI will be self-reinforcing:

Your code will have automatic loose and/or tight coupling capabilities with all other ARMI-integrated plugins

Your code will be immediately runnable with all community (or proprietary) ARMI input decks (e.g. of common benchmark problems), so we can reduce the amount of benchmark re-work done as a community

Your code will work with any established ARMI methodology/workflow (good for head-to-head comparisons)

You will never be locked into any proprietary software automation ecosystem because ARMI is licensed under a permissive Apache open-source license.

Since TerraPower invested in the system for 10 years straight, its capabilities are tried and true in advanced reactor design/engineering scenarios. TerraPower has built ARMI models of FFTF, EBR-II, JOYO, TWR designs, many ZPR and ZPPR configurations (Cartesian geometry), the VTR, and the TerraPower Molten Salt Reactor (MCFR). They have taken minor steps towards representing thermal reactors in ARMI and ARMI does include a very simple C5G7 LWR benchmark sample input deck, but we hope the community will help extend into this scope. TerraPower's investment in ARMI has certainly been primarily prioritized based on the evaluation of sodium-cooled fast reactors, but the Framework is intended to be generic.

Beyond the core, the ARMI vision includes models of the plant. This would enable the automation of plant system analysis, opening up relevance to broader scope design as well as for increasing engineering efficiency in the operating fleet.

This workshop will introduce the concept and design of ARMI, share some success stories about how it can be useful, and then will interactively go through the installation of the open-source ARMI framework (downloaded from GitHub) and some interactive first tutorial. To participate, you should bring along a Windows, Mac, or Linux laptop with Python 3.6 or greater on it, and with internet access. We will build a virtual environment for the demo and go from there. Alternatively you can go through the installation instructions in advance to get a head start, and let us know if you have troubles during the workshop.

The code is available today at github.com/terrapower/armi

Read more about its use at TerraPower in the 2017 open-access article: Touran, Nicholas W., et al. “Computational tools for the integrated design of advanced nuclear reactors.” *Engineering* 3.4 (2017): 518-526.

Plenary, Special Sessions and Events

MONDAY, JUNE 8

Opening Plenary

8:00-10:30 am

Details to come

OPD Honors & Awards Dinner

Time: 6:00-9:00 pm; **Location:** Rustler's Rooste

Join the Operations and Power Division in celebrating the accomplishments of their colleagues and a successful year as a division. This event is not included in your registration fee. The ticket price is \$85. Tickets may be purchased online or at the Registration Desk, space is limited.

TUESDAY, JUNE 9

ANS President's Special Session: The Intersection of Nuclear and National Security

8:00-9:30 am

Chair: Marilyn Kray (*President, ANS*)

The success and health of national security depend on all aspects of the nuclear community; private industry, academia, government, and national laboratories. However, progress in the commercialization of nuclear technology has slowed and with it the prominence of the United States as a leader in nuclear security and technology. Growing our commercial fleet is necessary to maintain our leadership in nuclear technology. A strong commercial nuclear sector is crucial to ensure the appropriate education of experts in nonproliferation and nuclear security. Laboratories and universities develop new technology pivotal for the expansion of the commercial fleet.

This session will focus on the past, present, and future of the intersection of national security and nuclear. It will examine the history of nuclear to understand how engineering, construction, and licensing were different and much faster in the past, and how that led the industry to where it is today. The relationship between military and civilian uses of nuclear will also be discussed, from Atoms for Peace to the possible use of microreactors in military applications. Ultimately, this will lead to the topic of the US' leadership in the nuclear industry on a global scale as it stands today and how to regain that leadership in the future.

WEDNESDAY, JUNE 10

General Chair's Special Session

8:00-9:30 am

Moderated: TBA

TBD

ANS Annual Business Meeting

5:45-7:00 pm

ANS encourages all members to attend the Annual Business Meeting. During the Business Meeting, members will receive reports from the President and other Society leaders, and ask questions and make comments on Society issues.

Plenary, Special Sessions and Events

THURSDAY, JUNE 11

Technical Tour: Palo Verde

Price: \$65 per attendee Time: 7:30 am – 3:00 pm

Palo Verde is located on a 4,250-acre site 55 miles west of downtown Phoenix. The station is managed by APS, which has the largest share of ownership amongst the seven utilities that own Palo Verde.

Palo Verde safely and reliably provides electricity for approximately 4 million people in Arizona, California, New Mexico and Texas. Located in an area of low seismic activity, Palo Verde is designed to safely withstand the maximum credible earthquake for the site's geographic location.

The robust containment dome structure is comprised of reinforced concrete/steel material that is pre-stressed and post-tensioned. It averages 4.5 feet thick, with a quarter-inch steel liner that gives it the equivalent strength of 35-foot thick non-reinforced concrete structure. The base of the concrete containment floor is 10-feet thick.

Palo Verde is the only nuclear plant in the United States that does not sit on a large body of water. Instead, it recycles more than 20-billion gallons of municipal effluent each year to meet its cooling needs. The treated water is piped to two storage reservoirs with a combined capacity of approximately one billion gallons. The reservoirs provide about 14 days storage of makeup water for the three nuclear units operating at full capacity during peak conditions in hot, summertime weather.

Wear Proper Attire and Safety Shoes with composite or steel toes, safety glasses with side shields, gloves on person, and hard hats are required in the plant and when traversing certain areas outside the plant, such as the cooling towers. We recommend composite toes for safety shoes, because steel toes will alarm the metal detectors in our Security Main Access Facility. Otherwise, steel toe footwear is acceptable. We will supply you with non-prescription standard or over-glasses safety eyewear, hard hat and other safety items as needed, such as hearing protection, sunscreen and gloves, which are required to be worn when handling materials. Wear comfortable cotton clothing appropriate for the season and desert environment. Synthetic fabrics are not recommended in radiologically controlled areas as they may attract radon gas. Please notify our staff if you have been treated with radioactive medication in the past ninety (90) days or will receive treatment prior to the trip.

Technical Sessions by Division

SPECIAL SESSIONS

*Opening Plenary Mon. am (8:00-10:30 am)

*ANS President's Special Session: The Intersection of Nuclear and National Security Tues. am (8:00-10:00 am)

*General Chair's Special Session, Wed. am (8:00-9:00 am)

AEROSPACE NUCLEAR SCIENCE AND TECHNOLOGY (ANSTD)

ANS Position Statement on the Use of Low Enriched Uranium in Space—Panel, Thu am

DECOMMISSIONING AND ENVIRONMENTAL SCIENCES (DESD)

Nuclear Energy's Role in Climate Change Policy—Panel, Mon pm

Work Force Development—Panel, Tue am

General Topics in Decommissioning, Wed am

Uranium Mine Reclamation—Panel, Wed pm

EDUCATION, TRAINING, AND WORKFORCE DEVELOPMENT (ETWDD)

Training, Human Performance, and Workforce Development, Mon pm

Cutting Edge Techniques in Education, Training and Distance Education, Tue pm

Focus on Communications—I—Panel, Tue pm

Focus on Communications—II—Panel, Tue pm

FUEL CYCLE AND WASTE MANAGEMENT (FCWMD)

Waste Management and Fuel Cycle Innovation Challenges for Advanced Nuclear Reactors—Gen IV (Including International Perspectives)—Panel, Mon pm

Characterization, Storage, and Transportation of Used Nuclear Fuel, Mon pm

Fuel Storage and Transportation for the Next Generation of Reactors—Panel, Tue pm

Impacts of the Change in the Definition of High-Level Waste—Panel, Tue pm

Chemical Treatment of Radioactive Waste, Wed am

Fuel Cycle and Waste Management: General, Wed pm

HUMAN FACTORS, INSTRUMENTATION, AND CONTROLS (HFICD)

Topics in Advanced Instrumentation, Mon am

Cyber Security for Nuclear Power Installations—I, Tue pm

Cyber Security for Nuclear Power Installations—II, Tue pm

General Topics in Instrumentation and Controls and Human Factors, Wed am

Online Monitoring and Prognostics, Wed pm

Digital Instrumentation and Control, Wed pm

ISOTOPES AND RADIATION (IRD)

Isotopes and Radiation: General, Tue am

MATERIALS SCIENCE AND TECHNOLOGY (MSTD)

Accident Tolerant Fuels, Mon pm

Fuels and Materials for Molten Salt Reactors, Mon pm

Nuclear Science User Facilities and Fuels and Materials for Molten Salt Reactors, Mon pm

In-Pile Testing of Nuclear Fuels and Materials, Tue am

Advanced Manufacturing/Additive Manufacturing—I, Tue pm

Advanced Manufacturing/Additive Manufacturing—II, Tue pm

Sensors and In-Pile Instrumentation, Wed am

Accelerated Materials Discovery, Wed pm

Aging of Materials, Wed pm

Nuclear Fuels—I, Wed pm

Nuclear Fuels—II, Thu am

Nuclear Fuels—III, Thu am

MATHEMATICS AND COMPUTATION (MCD)

Current Issues in Computational Methods—Roundtable, Mon pm

Transport Methods, Tue am

Monte Carlo and Multiphysics, Tue pm

Radiation Transport Software, Tue pm

Acceleration Methods, Wed am

Sensitivity, Uncertainty, and Machine Learning, Wed pm

NUCLEAR CRITICALITY SAFETY (NCSD)

Data, Analysis, and Operations in Nuclear Criticality Safety—I, Mon pm

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

Data, Analysis, and Operations in Nuclear Criticality Safety—III, Thu am

Review of Recent CSSG Activities—Panel, Mon pm

Sharing of Good Industry Practices and/or Lessons Learned in Nuclear Criticality Safety—Panel, Tue am

Balancing Competition and National Needs in the Medical Isotopes Market—Panel, Wed am

New Developments in Shipping Packages Related to Criticality Safety—Panel, Wed pm

ANS-8 Standards Forum, Wed pm

Technical Sessions by Division

NUCLEAR INSTALLATIONS SAFETY (NISD)

Nuclear Installations Safety: General—I, Mon pm
Nuclear Installations Safety: General—II, Tue am
Current Topics in Probabilistic Risk Analysis, Mon pm
Meeting the Challenges in Non-LWR PRA Standard Development—Panel, Wed am
Managing Hydrogen Systems in Nuclear Facilities: Lessons Learned from the DOE Complex and Industry—Panel, Wed pm

NUCLEAR NONPROLIFERATION POLICY (NNPD)

Prospects for Blockchain Technology in International Security/Safeguards—Panel, Mon pm
Lessons Learned from NNSA Consortias—Panel, Wed pm

OPERATIONS AND POWER (OPD)

Operations and Power: General, Wed pm
Energy Storage Systems and Integration with NPPs—I, Wed am
Energy Storage Systems and Integration with NPPs—II, Wed pm
Critical Heat Flux Experiments—Accident Tolerant Fuels—Panel Tue pm

RADIATION PROTECTION AND SHIELDING (RPSD)

Radiation Protection and Shielding: General, Tue am
Computational Methods for Radiation Protection and Shielding, Tue pm
From CAD to Transport for Radiation Protection and Shielding Calculations, Tue pm

REACTOR PHYSICS (RPD)

Reactor Physics of Advanced Reactors, Wed am
Reactor Physics of Micro Reactors for Terrestrial and Space Applications—I, Tue pm
Reactor Physics of Micro Reactors for Terrestrial and Space Applications—II, Wed pm
Reactor Physics Design, Validation, and Operational Experience, Wed am
Reactor Analysis Methods—I, Tue pm
Reactor Analysis Methods—II, Wed pm
Reactor Analysis Methods—III, Thu am
Reactor Physics: General, Mon pm
Transformational Challenge Reactor—I, Mon pm
Transformational Challenge Reactor—II—Panel, Tue am

ROBOTICS AND REMOTE SYSTEMS (RRS)

Robotics and Remote Systems: General, Thu am

THERMAL HYDRAULICS (THD)

Thermal Hydraulics Activities for the Versatile Test Reactor, Tue pm
Experimental Thermal Hydraulics—I, Mon pm
Experimental Thermal Hydraulics—II, Thu am
Computational Thermal Hydraulics—I, Tue am
Computational Thermal Hydraulics—II, Wed pm
General Thermal Hydraulics, Mon pm
Two-Phase Flow and Heat Transfer Fundamentals, Mon pm
Thermal Hydraulics of Nuclear Micro-Reactors and MSR, Wed pm
Thermal Hydraulics Challenges and Research Opportunities in Licensing Advanced Reactor Designs—Panel, Tue pm
Thermal Performance for Integrated Energy Systems: Design, Development, and Deployment—Panel, Tue pm
Challenges and Opportunities in Thermal Hydraulics of High Temperature Gas Cooled Reactors—Panel, Wed am

YOUNG MEMBERS GROUP (YMG)

Leadership Styles & Management Techniques—Panel, Mon pm
Communicating Safety & Risk to the Public—Panel, Tue am
Pitch Your Job—Panel, Tue pm
Innovating Nuclear Through an Entrepreneurial Student Prize Competition—Panel, Tue pm
Resume/CV Workshop—Panel, Wed pm
Carbon pricing and Clean Energy Standards 101—Panel, Wed pm

MONDAY, JUNE 8

TECHNICAL SESSIONS - 1:00 PM

Nuclear Installations Safety: General—I

Sponsored by NISD. Session Organizer: Zachary Jankovsky (SNL)

Summary of the Reduction of Severe Accident Uncertainties (ROSAU) Project, Jeremy R. Licht, Mitchell T. Farmer, Stephen W. Lomperski, Nathan C. Bremer (ANL), Sudhamay Basu (U.S. NRC)

Development of Integrated Mechanistic Source Term Assessment Software for Liquid Metal Reactors, Matthew D. Bucknor, Acacia J. Brunett, James L. Jerden, David Grabaskas, Daniel O'Grady, Adam J. Dix (ANL)

Methodology for Selecting Advanced Reactor Licensing Pathways, Robert Patrick White (MIT)

Evaluation of Flow Boiling Transient Critical Heat Flux Experiment and Simulation, Soon Kyu Lee, Nicholas R. Brown (U.T., Knoxville)

Safety Design Approach for a Versatile Micro Reactor Safety Demonstration Facility, Jason P. Andrus (INL), Troy P. Reiss (Battelle)

Training, Human Performance and Workforce Development

Sponsored by ETWDD. Session Organizer: Lisa M. Marshall (NCSU)

Nuclear Science Training for Secondary School Teachers at Argonne National Laboratory–2019, David S. Grabaskas, Sunaree Hamilton (ANL), Gerald Reyes (IAEA), Micah Pacheco (Department of Education, Philippines), Habibah Adnan (Malaysian Nuclear Agency), John Domyancich, DeeDee Rudisel, Natalie Zender (ANL)

Partnering to Grow a Robust Nuclear Workforce and Business Supply Chain, Amy Lientz, Tom Kealey (Idaho Director of Commerce), Rick Aman (Community College of Eastern Idaho), Mayor Rebecca Casper (City of Idaho Falls)

Digital Assistant Tool for Long Term Operation of Aging Assets, Micah Tinklepaugh, Emma Wong (EPRI)

Innovative Way to Save Tens of Millions of Dollars and Improve Plant Performance, Gary R. Cavanaugh (Marathon Consulting Group)

Nuclear Energy's Role in Climate Change Policy

Sponsored by DESD; Cosponsored by OPD. Session Organizer: Leah Parks (NRC)

Nuclear energy has a crucial role to play in addressing the global need to reduce emissions. Emission-reduction policies should neither favor nor limit any one energy source over another. Instead, such policies should evaluate energy sources based upon their ability to contribute reliably to meeting emission-reduction targets. This panel will cover initiatives at the international, federal, state and local level that allow nuclear to play a role addressing climate change. International examples include ANS's participation with the Nuclear for Climate Initiative² and the Declaration from Nuclear Societies³ which calls for the Clean Energy Ministerial to ensure that nuclear is part of the clean energy portfolio. Also, several states have taken action that recognize the role of nuclear energy in their future clean energy portfolio. The panel will include an interactive discussion on performance-based, technology-neutral policy approaches to encourage innovation and achieve intended emission-reduction targets.

Panelists include

Bill Burchill (ANS President 2008-2009)

John Kelly (ANS President 2018- 2019)

Matt Crozat (Nuclear Energy Institute)

Michael Green (Arizona Public Service)

Technical
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MONDAY, JUNE 8

TECHNICAL SESSIONS - 1:00 PM

Waste Management and Fuel Cycle Innovation Challenges for Advanced Nuclear Reactors—Gen IV (Including International Perspectives)—Panel

Sponsored by FCWMD; Cosponsored by OPD. Session Organizer: Steve Napier (*National Nuclear Laboratory*)

With the move to a clean energy agenda internationally there is an increased focus on advanced reactor technologies that provide flexible power, heat, hydrogen and desalination solutions. With any new reactor system there is an associated fuel cycle that accompanies it. This international panel explores the spent fuel and overall fuel cycle challenges that need to be addressed for these new reactor types to be successfully deployed in a timescale that will meet the market demand. There will be a particular focus on where future fuel cycles and waste management requirements may be significantly different to the current systems, and therefore the need for future research and innovation. It will explore current international research and innovation programs and the areas where international collaboration can contribute and accelerate the programs.

Panelists:

Paul Nevitt (*UK National Nuclear Laboratory*)

Dan Mathers (*UK Nuclear Innovation and Research Office*)

Jack D. Law (*INL*)

Sal Golub (*U.S. DOE*)

Andrew Worrall (*ORNL*)

TBD

Experimental Thermal Hydraulics—

Sponsored by THD. Session Organizer: Jun Wang (*U.W., Madison*)

High fidelity Characterization of the Flow in a 5x5 Rod Bundle with a Customized Spacer Grid, Camila Freitas Matozinhos, Gabriel Caio Queiroz Tomaz, Duy-Thien Nguyen, Yassin A. Hassan (*Texas A&M*)

Experimental Quantification of Form Drag on Rising Bubbles Using PIV, Alexander M. Duenas, Isaiah Wieland, Wade R. Marcum, Qiao Wu (*Oregon State*)

Design of a Pebble Bed Heat Transfer Separate Effects Test, Jacob Uselman, Izabela Gutowska (*Oregon State*), Nicolas Zweibaum (*Kairos Power*), Joshua K. Halsted, Shikha Kumar, Connor Dionne, Brian G. Woods (*Oregon State*)

Experimental and Calculated Research of Coolant Mixing in Dynamic Testing, Dmitry Oleksyuk, Daniya Kireeva (*Kurchatov Institute*)

Investigation of the Influence of the Bundle Geometry Distortion on the Critical Heat Flux, Daniya Kireeva, Dmitry Oleksyuk (*Kurchatov Institute*)

Accident Tolerant Fuels

Sponsored by MSTD Session Organizer: Kenneth J. Geelhood (*PNNL*)

Impact of Fission Product Content on Phase Development in U_3Si_2 Fuel, Kaitlin E. Johnson (*Univ. South Carolina*), Denise L. Adorno (*Westinghouse, Sweden*), Vancho Kocovski, Tashiema L. Ulrich, Joshua T. White (*LANL*), Antoine Claisse (*Westinghouse, Sweden*), Jacob W. McMurray (*ORNL*), Theodore M. Besmann (*Univ. South Carolina*)

An Alternative Synthesis Route to U_3Si_2 , Adrian Gonzales, Elizabeth Sooby Wood (*U.T., San Antonio*), Kent Coulter (*Southwest Research Institute*)

SiC Cladding Tube Thermal Conductivity Measurement Using Phase Change Materials, Jiping Zhang, Arthur Blacklock, Jonas Opperman, Jack Gazza, Robert T. Buckingham (*General Atomics*)

Failure Behavior of Nuclear-Grade FeCrAl Cladding Under Simulated Pellet-Cladding Mechanical Interaction Conditions, Benton Garrison, Rick R. Lowden (*ORNL*), Mahmut Nedim Cinbiz (*INL*), Nicholas R. Brown (*U.T., Knoxville*), Kory Linton (*ORNL*)

Accident Tolerance of Zircaloy-2 and FeCrAl Under Simulated Cyclic Dryout Conditions, Ken Kane (*ORNL*), Soon Kyu Lee (*Univ. New Mexico*), Bruce A. Pint (*ORNL*), Nicholas R. Brown (*U.T., Knoxville*)

MONDAY, JUNE 8

TECHNICAL SESSIONS - 1:00 PM

Fuels and Materials for Molten Salt Reactors

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

The Molten Salt Thermodynamic Database (*MSTDB*): A Resource for MSR Design, Development, and Regulation, Theodore M. Besmann (*Univ. South Carolina*)

Corrosion Behavior of Nickel-Based Superalloys in Fluoride Salts for Molten Salt Reactors, Pavel Podany, Peter Slama, Martina Koukolikova (*COMTES FHT a.s.*), Martin Marecek (*Research Centre Rez*)

Thermodynamic Insights into Corrosion in NaCl-LiCl-UCI₃-UCI₄ Molten Salt, Jacob A. Yingling, Theodore M. Besmann, Johnathon Ard, Kaitlin E. Johnson, Matthew Scott Christian (*Univ. South Carolina*), Jake W. McMurray (*ORNL*)

Progress in Thermodynamic Investigations of Molten Fluoride Salts at Ontario Tech. University, Ksenia Lipkina, D. Hallatt, E. Geiger, B. W. N. Fitzpatrick, M. H. A. Piro (*Ontario Tech. Univ.*)

Conceptual Design of the Versatile Experimental Salt Irradiation Loop (VESIL) in the Advanced Test Reactor, Abdalla Abou-Jaoude (*INL*), Sandesh Bhaskar (*NCSU*), Calvin M. Downey (*INL*)

Current Issues in Computational Methods–Roundtable

Sponsored by MCD. Session Organizer: Robert E. Grove (*ORNL*)

This discussion will involve several invited panelists to discuss issues of immediate concern to the mathematics and computation community.

Panelists TBD

Reactor Physics: General

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

From Nuclear Data to Reactor Design, Vladimir Sobes (*U.T., Knoxville*), Luiz Carlos Leal (*IRSN*), Benoit Forget (*MIT*), Barry D. Ganapol (*Univ. Arizona*) Invited

Development of Coupled Monte Carlo Transport-Burnup and CFD Simulations in SuperMC, Louhanrong Yu, Lei Wang, Bin Wu, Shengpeng Yu, Pengcheng Long (*Institute of Nuclear Energy Safety Technology*)

Verification of Predicted Energy Deposition Using CASMO5 Coupled Neutron-Gamma Transport Solutions for Selected VERA Benchmark Problems, Rodolfo M. Ferrer, Joshua Hykes, Charles A. Wemple (*Studsвик Scandpower*)

Control Rod Depletion in MPACT, Aaron James Reynolds (*Oregon State*), Shane G. Stimpson, Aaron Marc Graham (*ORNL*)

University of Tennessee Fast Neutron Source Design History, J. Wesley Hines, John L. Pevey, Ondrej Chvala, Vlad Sobes (*U.T., Knoxville*)

Data, Analysis, and Operations in Nuclear Criticality Safety–I

Sponsored by NCS. Session Organizer: Vladimir Sobes (*U.T., Knoxville*)

Calculated Influence of a Niobium Reflector in Plutonium Systems, Tracy E. Stover (*SRNL*)

NCS Design and Evaluation of New High-Density Storage Containers, Amber J. McCarthy (*Y-12 NSC*)

ANSI/ANS-8.7 Applications for the Storage of Criticality Control Overpacks, Brittany M. Williamson (*Savannah River Nuclear Solutions*)

A Parametric Study of Uranium Sensitivity in an Aqueous Separations Simulation, Tracy E. Stover (*SRNL*), Camden Eugene Blake (*RPI*)

Preparation for Electrolytic Dissolution at H-Canyon, Joshua Butler, Tracy E. Stover (*SRNL*)

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MONDAY, JUNE 8 TECHNICAL SESSIONS - 3:30 PM

Current Topics in Probabilistic Risk Analysis

Sponsored by NISD. Session Organizer: Zachary Jankovsky (SNL)

A Multi-Criteria Benefit Evaluation Methodology Applied to FLEX Strategies in Nuclear Power Plants, Sai Zhang, Zhegang Ma, Hongbin Zhang (INL)

Common-Cause Component Group Modeling Issues in Probabilistic Risk Assessment, Zhegang Ma, Robert Buell, James Knudsen, Sai Zhang (INL)

Potential Improvements in Human Error Probability Seed Optimizer Algorithms, Nathan R. DeKett (ENERCON)

Projecting Top Event Frequencies Using a Pareto Distribution Model, Nathan R. DeKett (Enercon)

Topics in Advanced Instrumentation

Sponsored by HFICD. Session Organizer: Jamie Baalis Coble (U.T., Knoxville)

Sensor Technology Gaps for Nuclear Environments, Dan Floyd (U.T., Knoxville), N. Dianne B. Ezell (ORNL)

A Wireless Resonance Inductive-Capacitive Sensor System for Nuclear Reactor, Yuan Gao, Jerry Potts, Heng Ban (Univ. Pittsburgh), Daniel Michael Wachs (INL)

Electromagnetic Coupling for Wireless Signal Transmission in Nuclear Reactors, Jerry Potts, Yuan Gao, Heng Ban (Univ. Pittsburgh), Daniel Michael Wachs (INL)

Embedding Sensors in Metal and Ceramic Structures, Christian M. Petrie (ORNL)

General Thermal Hydraulics

Sponsored by THD. Session Organizer: Jun Fang (ANL)

Improvement of Advanced Nuclear Reactor Safety Analysis Codes Using CFD, Rohan Milind Biwalkar, Sola Talabi (Pittsburgh Technical), Kenneth Redus (Redus and Associates)

CFD Modeling of Hot-Channel for Potential High-Power Configuration of Missouri S&T Reactor, Thaqal Alhuzaymi, Ayodeji B. Alajo, Joshua Schlegel (Missouri S&T)

Study on Selecting Conservative Axial Power Shape for DNBR Design Limit, Shane Park (KEPCO)

Thermal Performance Test and COMSOL Analysis of Wavy Channel 800HT PCHE in Helium Experimental Loop, Chan Soo Kim, Eung Seon Kim, Min Hwan Kim (KAERI), Jae Sool Shim, Dong Hyun An (YOUNG NAM Univ.)

Theoretical Exploration of Heat Transfer Characteristics of Liquid Metals, Yaou Shen, Shinian Peng, Mingyu Yan, Yu Zhang, Jian Deng (Nuclear Power Institute of China)

Characterization, Storage, and Transportation of Used Nuclear Fuel

Sponsored by FCWMD. Session Organizer: Sven O. Bader (Orano)

Analysis of Potential Standardized Canister Deployments at Commercial U.S. Nuclear Reactor Sites, Robert Anthony Joseph, Riley M. Cumberland, Robert L. Howard (ORNL)

Rapid Analytic Determination of Dry Cask Storage Canister Internal Temperatures, Evan T. Palmer, Iza Lantgios, Matthew Michael Barry (Univ. Pittsburgh)

Development of a CFD Model for the Drying of Aluminum-Clad Spent Fuel, Nathaniel Cooper, Jamil A. Khan, Tanvir Farouk, Yi Wang (Univ. South Carolina), Rebecca E. Smith (INL), Travis W. Knight (Univ. South Carolina)

Inverse Depletion of Used Nuclear Fuel: A Bayesian Approach, Bassam A. Khuwaileh, Fatima Ibrahim AlHamadi, Mohammad Al-Shabi, Walid A. Metwally (Univ. Sharjah)

MONDAY, JUNE 8

TECHNICAL SESSIONS - 3:30 PM

Two-Phase Flow and Heat Transfer Fundamentals

Sponsored by THD. Session Organizer: Matthew D. Zimmer (NCSU)

CFD Analysis of PRHR-Heat Exchanger Using Euler Multiphase Model, Soumitra Mangesh Vadnerkar, Xue Yang (*Texas A&M, Kingsville*)

Effects of Liquid Viscosity on Interfacial Friction Factor of Swirling Annular Flow, Atsuya Imaizumi, Yoshihiro Yahara, Kosuke Hayashi, Akio Tomiyama (*Kobe Univ.*)

Artificial Intelligence-Based Phase-Change Regime Classification of Acoustic Emission Detection in Pool Boiling, Doyeong Lim, In Cheol Bang (*UNIST*)

Experimental Study of Natural Circulation Boiling Heat Transfer in Vertical Single Tube for PCCS, Dong-Wook Jerng (*Chung-Ang Univ.*), Sun Taek Lim (*Incheon National Univ.*)

Prospects for Blockchain Technology in International Security/Safeguards

Sponsored by NNPD. Session Organizer: Luc G. G. Van Den Durpel (*Nuclear-21*)

Distributed/Shared Ledger Technology (*D/SLT*), more widely referred to as 'Blockchain', has gained a lot of visibility since the last few years, not at least, in the financial world. Being projected as potential game-changing the way various transactions can be handled in sectors such as banking, trade and supply chains, smart manufacturing and energy systems, the effective applicability in international security and safeguards remains topic for discussion.

Various organizations are evaluating the role D/SLT may represent for international safeguards indicating a spectrum of potential benefits to the safeguards system. Though, D/SLT might not be unique in providing such benefits as modern information technology may be even a more effective and trusted approach to cope with future international safeguards objectives.

This panel session aims at:

Informing ANS-members on the principles of D/SLT and the applicability in international safeguards;

Highlight the benefits and possible challenges towards such application;

Sketch the prospects and next steps for such innovative technologies to further the effectiveness and transparency of safeguards;

To inform on various activities worldwide on this domain.

Panelists TBD

Nuclear Science User Facilities and Fuels and Materials for Molten Salt Reactors

Sponsored by MSTD. Session Organizer: J. Rory Kennedy (*INL*)

The Effect of Coordination Numbers in Molten Salt Thermodynamic Models, Matthew Scott Christian, Johnathon Ard, Theodore M. Besmann (*Univ. South Carolina*)

Sound Propagation Characteristic of Phononic Crystals Pipeline with Periodic Vibration Isolation Mass, Qingna Zeng, Donghui Wang, Fenggang Zang, Yixiong Zhang, Xiaozhou Jiang (*Nuclear Power Institute of China*)

NSUF RAD-AFM: Nanoscale Material Property Measurements of Radioactive Materials, Shawn Riechers (*PNNL*), Andrew M. Casella (*Battelle*), David J. Senor (*PNNL*), Pradeep Ramuhalli (*ORNL*)

Gamma Prime Precipitate Formation in Irradiated Alloys 800H and 800H-TMP, Weicheng Zhong, Lizhen Tan (*ORNL*), Yaqiao Wu (*Boise State*)

Leadership Styles & Management Techniques–Panel

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions*)

More information to come.

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MONDAY, JUNE 8 TECHNICAL SESSIONS - 3:30 PM

Transformational Challenge Reactors–Panel

Sponsored by RPD. Session Organizer: Benjamin R. Betzler (*ORNL*)

This session will provide an introduction to the Department of Energy Office of Nuclear Energy Transformational Challenge Reactor (*TCR*) Demonstration program, which aims to change the deployment timelines and costs of new nuclear power generation. To accomplish this, the TCR program will leverage advances in numerous scientific areas---materials, manufacturing, sensors and control systems, data analytics, and high-fidelity modeling and simulation---to accelerate design, manufacturing, qualification, and deployment of advanced nuclear energy systems. Speakers from the U.S. DOE, national laboratories, and nuclear industry will discuss their perspectives on the program, it's progress to date, and how it enables improvements in the existing plants and deployment for the advanced reactor community.

Panelists TBD

Review of Recent CSSG Activities–Panel

Sponsored by NCSD. Session Organizer: David K. Hayes (*LANL*)

The Criticality Safety Support Group (CSSG) was formed in response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 97-2, Continuation of Criticality Safety at Defense Nuclear Facilities in the Department of Energy (DOE) Complex. The CSSG functions as the technical support group to the DOE Nuclear Criticality Safety Program (NCSP) Manager, providing operational and technical expertise pertinent to the criticality safety needs of DOE missions. This expertise is relevant to integral experiments, nuclear data, analytical methods, training, and organizational structures supporting the development and execution of the NCSP.

While most CSSG Taskings and Responses are openly available, they are not often discussed in an open forum. This session will include an open discussion of recent CSSG activities to help the nuclear criticality safety community better understand the CSSG and current criticality safety issues around the DOE Complex.

Panelists:

David Erickson (*CSSG Chair*)
David Hayes (*CSSG Deputy Chair*)
Mikey Brady Raap
David Heinrichs
Jerry Hicks
Kevin Kimball
Tom McLaughlin
Jim Morman
Fitz Trumble
Robert Wilson

TUESDAY, JUNE 9

TECHNICAL SESSIONS - 10:00 AM

Nuclear Installations Safety: General II

Sponsored by NISD. Session Organizer: Zachary Jankovsky (SNL)

Establishment of Control Room Habitability Analysis Methodology Postulated the Event of Pressurized Tank/System of Hazardous Gas Release (2) - Transient Concentration Analysis in Control Room, Anjun Jiao (*Palo Verde Nuclear Generating Station*), David Ricks, Thomas A. Remick, Brian J. Hansen (*Palo Verde Nuclear Operating Station*), Robert Hovland (*Davis-Besse Nuclear Power plant*)

Nonlinear Dynamic Explicit Analysis for 2-over-1 Interaction, Nicholas DeVone Catella, Christine H. Roy (*Simpson Gumpertz & Heger*)

Nuclear Power Plant Evacuation: Gaps, Strategies, and Activity Scheduling, Adam Stein, Paul Fischbeck (*Carnegie Mellon*), Sola Talabi (*Pittsburgh Technical College*), Cristian Marciulescu (*Electrical Power Research Institute*)

Considerations for Environmental Impact Assessment for Small Modular Reactors, Gerardo Martinez-Guridi (*IAEA*), Marcelle Phaneuf (*Canadian Nucl Safety Comm*), Hadid Subki, Muzammal Hussain, Frederik Reitsma (*IAEA*)

Understanding ANSI N45.2, "Quality Assurance Program Requirements for Nuclear Power Plants", Carmen DeLong (*Diablo Canyon*) invited

Communicating Safety & Risk to the Public–Panel

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions*)

More information to come.

Work Force Development–Panel

Sponsored by DESD; Cosponsored by ETWDD. Session Organizer: James J. Byrne (*Byrne & Associates*)

The decommissioning of nuclear facilities is an industrial activity that is growing worldwide, creating job opportunities at all educational levels. Over the last decades, many companies have been involved in decommissioning projects that are targeted at delivering an environmentally friendly end-product such as a fully restored green field site that can be released from regulatory control.

This session will address the following questions in relation to education and training in nuclear decommissioning:

- What are the competence needs for the future?
- What are the education and training opportunities?
- How can we stimulate interest and future talent?

Panelists:

J. Wesley Hines (*U.T., Knoxville*)
Leo Lagos (*Florida International Univ.*)
Herb Pollard III (*INL*)
Stuart Walker (*U.S. EPA*)

Isotopes and Radiation: General

Sponsored by IRD. Session Organizer: Igor Jovanovic (*Univ. Michigan*)

Betavoltaic Nuclear Microbattery Based on Graphene/Si Schottky Junction, Xiaoyu Wang, Weiping Liu, Jiachen Zhang, Yuncheng Han, Taosheng Li, Chunjing Li (*Inst. Nucl. Ener. Safety Technol.*)

Correlation of Absolute ^{238}U Bioavailability (^{238}U -ABA) and ^{238}U Bioaccessibility Fraction (^{238}U -BAF) Using IAEA-312 Standard Reference Soil, Nur Shahidah Binti Abdul Rashid, Um Wooyong (*POSTECH*), Khoo Kok Siong, Nur Syamimi Diyana Binti Rodzi (*National Univ. Malaysia*)

Neutronics Analysis for Designing a Low Activation Heated Test Cell, Michael Buratynski, William J. Walters (*Penn State*)

Predicting Background Count Rate of a Mobile Detector Using an Optimal Linear Ensemble of Learning Kernel Machines, Miltiadis Alamaniotis (*U.T., San Antonio*)

EPR Study of Sugar and Artificial Sweeteners, Fatma Abdelrahman (*NCSU*)

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TUESDAY, JUNE 9 TECHNICAL SESSIONS - 10:00 AM

Computational Thermal Hydraulics - I

Sponsored by THD. Session Organizer: Xiaodong Sun (*Univ. Michigan*)

Gas Dispersion Analysis for Glovebox Accident in a Ventilated Process Room, Si Young Lee (*SRNL*)

Modelling Loss of Flow Transients in Gallium Thermal-Hydraulic Facility Using Systems Code SAS4A/ SASSYS-1 and Using CFD, Sundar Namala, Rizwan Uddin (*Univ. Illinois*), Tyler S. Sumner (*ANL*)

CFD Modeling of NBSR Thermal Shield, Manikanta Grandhi, Xue Yang (*Texas A&M, Kingsville*)

RELAP5-3D Evaluation of Near-Term ATF Claddings Under SBO Scenarios, Hongbin Zhang, Cliff B. Davis (*INL*)

Probing Interfacial Momentum Closures in Two-Phase Bubbly Flow with Machine Learning-Aided Methods, Han Bao (*INL*), Jinyong Feng (*MIT*), Hongbin Zhang (*INL*), Nam T. Dinh (*NCSU*)

Radiation Protection and Shielding: General

Sponsored by RPSD. Session Organizer: Irina I. Popova (*ORNL*)

Shielding Analyses for the VENUS Instrument Enclosure, Irina I. Popova, F. X. Gallmeier (*ORNL*)

Assessment of Electrostatic Radiation Shielding Efficacy via Void Area Calculation, Luke A. Stegeman, Rajarshi Pal Chowdhury (*Kansas State*), Matthew Lund (*Univ. Utah*), Dan J. Fry (*Johnson Space Center*), Stojan M. Madzunkov (*Jet Propulsion Laboratory*), Amir A. Bahadori (*Kansas State*)

Topology Optimized Radiation Shields, Edward S. Lum, Ivan Fuller, John Bernardin (*LANL*)

Dose Analysis for a Neutron Source Driven Subcritical Assembly, Cliff Hance Ghiglieri, Jeffrey C. King (*CSM*)

U.S. EPA Superfund Radon Vapor Intrusion Screening Level (RVISL) Calculator, Stuart A. Walker (*U.S. EPA*)

In-Pile Testing of Nuclear Fuels and Materials

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Preliminary Results from In-Pile Transient Boiling Experiments at the TREAT Facility, Colby B. Jensen, Charles P. Folsom, Nicolas Eric Woolstenhulme, Austin D. Fleming (*INL*), Robert J. Armstrong (*U.W., Madison*), Daniel Michael Wachs (*INL*), Richard O. Hernandez, Nicholas R. Brown (*U.T., Knoxville*), Kevin Joe Terrill, Richard N. Christensen (*Univ. Idaho*)

Informing Transient Testing of Fuel Designs for the Transformational Challenge Reactor, Robert Kile (*U.T., Knoxville*), Daniel Schappel, Aaron J. Wysocki, Gokul Vasudevamurthy, Kurt A. Terrani (*ORNL*), Nicholas R. Brown (*U.T., Knoxville*)

Strontium Diffusivity in IG-110 Graphite Using a Time-Release Method, Taylor Mae Weilert (*Univ. Missouri Columbia*)

Establishing Maximal Core Excess Reactivity Envelope for TREAT Test Vehicle Insertion, John D. Bess, Nicolas Eric Woolstenhulme, James R. Parry (*INL*)

HFIR Irradiation Testing Supporting the Transformational Challenge Reactor, Annabelle Le Coq, Kory Linton, Patrick Champlin, Richard H. Howard, Xunxiang Hu, Thak Sang Byun, Kurt A. Terrani (*ORNL*)

TUESDAY, JUNE 9

TECHNICAL SESSIONS - 10:00 AM

Transport Methods

Sponsored by MCD. Session Organizer: Steven P. Hamilton (*ORNL*)

Implicit Methods with Reduced Memory for Time-Dependent Boltzmann Transport Equation, Dmitriy Y. Anistratov (*NCSU*)

Matrix Riccati Equation Method (MREM) of Solution of the Neutron Transfer Equation, Barry D. Ganapol (*Univ. Arizona*)

A Novel Analytical Nodal Method for the S_N Transport Equation, Joshua Rocheleau, Dean Wang (*Ohio State*)

Solving the S_N Transport Equation in Cylindrical Geometry with the Lax-Friedrichs WENO Fast Sweeping Method, Shengcheng Zhou, Zhipeng Li, Tangpei Cheng, Gang Li, Li Deng (*CAEP*)

Transformational Challenge Reactor

Sponsored by RPD. Session Organizer: Benjamin R. Betzler (*ORNL*)

Design Down Selection for the Transformational Challenge Reactor, Benjamin R. Betzler, Brian J. Ade, Aaron J. Wysocki, Phillip C. Chesser, Michael Scott Greenwood, Peter L. Wang, Nathan D. See, Xunxiang Hu, Kurt A. Terrani (*ORNL*)

Power Level Down Selection for the Transformational Challenge Reactor, Benjamin R. Betzler, Brian J. Ade, Aaron J. Wysocki, Prashant K. Jain, Michael Scott Greenwood, Jordan D. Rader, Jesse J. W. Heineman (*ORNL*), Robert Kile, Nicholas R. Brown (*U.T., Knoxville*), Kurt A. Terrani (*ORNL*)

Control Element Design for the Transformational Challenge Reactor (TCR), Joseph R. Burns, Benjamin R. Betzler, Brian J. Ade (*ORNL*), Florent Heidet, Aurelien X. Bergeron (*ANL*)

Transformational Challenge Reactor Moderator Material Selection to Achieve Fuel Minimization, Aurelien X. Bergeron, Florent Heidet (*ANL*), Benjamin R. Betzler, Brian J. Ade (*ORNL*), Prasad Vegendla, Subhasish Mohanty (*ANL*)

Thermal Neutron Scattering Measurements of YHx for the Transformational Challenge Reactor, Christopher W. Chapman, Xunxiang Hu, Jesse Brown, Goran Arbanas, Alexander Kolesnikov, Yongqiang Cheng, Luke Daemen (*ORNL*)

Sharing of Good Industry Practices and/or Lessons Learned in Nuclear Criticality Safety-Panel

Sponsored by NCSD. Session Organizer: Deborah Ann Hill (*National Nuclear Lab*)

Fundamental to the successful operation of any nuclear site is a first class safety culture which strives to continually improve in response to good industry practices and operating experience feedback. Speakers will provide examples of either specific good practices and/or lessons learned at their site, following which an audience discussion will be initiated on alternative good practices and experiences in these areas.

Panelists TBD

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TUESDAY, JUNE 9

TECHNICAL SESSIONS - 1:30 PM

Cyber Security for Nuclear Power Installations—I

Sponsored by HFICD; Cosponsored by NNPD. Session Organizer: Jamie Baalis Coble (*U.T., Knoxville*)

The Nuclear Digital I&C System Supply Chain Cyber-Attack Surface, Shannon L. Eggers (*INL*)

Development of a Framework for NPP Process-Aware Cyber Attack Detection and Diagnosis Methodology, Chanyoung Lee, Poong Hyun Seong (*KAIST*)

Development of Initiating Cyber Threat Scenarios and the Probabilities Based on Operating Experience Analysis, Sang Min Han, Poong Hyun Seong (*KAIST*)

Advantages of a Game-Theoretic Approach for Nuclear Cybersecurity, Lee T. Maccarone, Daniel G. Cole (*Univ. Pittsburgh*)

Cutting Edge Techniques in Education, Training, and Distance Education

Sponsored by ETWDD. Session Organizer: Lisa M. Marshall (*NCSU*)

PLuS Alliance Nuclear Engineering Online Course Exchange Program, Keith E. Holbert (*Arizona State Univ.*), John Fletcher, Patrick A. Burr, Edward G. Obbard (*Univ. New South Wales*)

Neutronic and Thermal Hydraulic Calculations for Subcritical Fissile Solution System Analysis, Seung Jun Kim, Andrew William Larsen, Kelley Marie Verner, Joetta M. Goda, Alexander Joseph Wass (*LANL*)

Flawless 'Welds' in Less Than 60 Seconds Between Similar and Dissimilar Materials, Paul Cheng (*FuseRing.com*), Adrian Gerlich (*Univ. Waterloo*)

Considerations for Bringing New Suppliers into the Nuclear Supply Chain, Elina Teplinsky, Anne Leidich (*Pillsbury Winthrop Shaw Pittman*)

Thermal Hydraulics Activities for the Versatile Test Reactor

Sponsored by THD; Cosponsored by RPD. Session Organizer: Yassin A. Hassan (*Texas A&M*)

Evaluation of Pressure Drop Correlations for the Wire-Wrapped Rod Bundles, Su-Jong Yoon (*INL*), Florent Heidet (*ANL*)

Verification of Transient Simulations Using the SAS4A/SASSYS-1 Coupled Channel Interface, Daniel O'Grady, Acacia J. Brunett, Thanh Q. Hua, Guojun Hu, Rui Hu, Thomas H. Fanning, Guanheng Zhang (*ANL*)

TRACE Modeling of Closed-Loop, Lead-Cooled Cartridges for Use in the Versatile Test Reactor, ThienAn Duc Nguyen (*Univ. Florida*), S. Jun Kim, Russell C. Johns (*LANL*), Justin K. Watson (*Univ. Florida*), Cetin Unal, Andrew Larsen (*LANL*)

Sodium-Cooled Reactor Fuel Assembly Hydraulic Holddown, Earl E. Feldman (*ANL*)

Fuel Storage and Transportation for the Next Generation of Reactors—Panel

Sponsored by FCWMD. Session Organizer: Sven O. Bader (*Orano Federal Services*)

With the heightened interest in the next generation of reactors, which there currently are a large variety of spanning from micro-reactors to SMRs to existing LWRs to the large NGNP, the storage and transportation of their used/spent fuels will be discussed/identified by an expert panel. This panel will examine lessons learned from similar activities associated with the existing SNF and HLW and how these lessons should be considered by the next generation of reactor offerors and what unique issues, if any, the fuels from these reactors may pose to these fundamental activities.

Panelists TBD

TUESDAY, JUNE 9

TECHNICAL SESSIONS - 1:30 PM

Thermal Performance for Integrated Energy Systems: Design, Development and Deployment—Panel

Sponsored by THD. Session Organizer: Piyush Sabharwall (*INL*)

Economic, environmental, and political pressures are consistent powers of change. Over the past several decades, nuclear has remained the principle force for reliable, cost-effective electricity and clean, carbon-free energy. However, it is no secret that sufficient change in the energy market has accumulated, leading to a tipping point for nuclear power within the United States. As in all other markets, nuclear must adapt to survive and remain a critical cog in America's energy portfolio. Integrated energy systems, expanding the nuclear energy market beyond electricity to thermal heat applications and flexible operation, may be the key to nuclear's existence in the 21st century and beyond. In this session, various panelists will highlight the ongoing research for development and deployment of such systems and provide examples from use cases that are currently being analyzed for further discussion on technical merits and foreseen challenges.

Panelists TBD

Computational Methods for Radiation Protection and Shielding

Sponsored by RPSD. Session Organizer: Michael Lorne Fensin (*LANL*)

Investigation into the Breakdown of Assumptions for 1D Radiation Transport in Air, Lucas M. Rolison, Michael Lorne Fensin, Karen Corzine Kelley, Steve S. McCready (*LANL*)

First Steps in Scaling Adjoint Response to Areal Density for 1-D Neutron Transport in Air, Michael Lorne Fensin (*LANL*)

International Platforms to Perform Atmospheric Dispersion Models for Dose Projection, Sanjoy Mukhopadhyay (*IAEA*)

VRdose and COSSAN Coupling for Uncertainty Quantification of Deterministic Radiation Transport Calculations, Lucy Elizabeth Murray (*Univ. Liverpool*), Bruno Rudi Merk (*Univ. Liverpool/NNL*), Qasim Kapasi (*NNL*)

Advanced Manufacturing/Additive Manufacturing—I

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Proton Radiation Effects on the Mechanical and Chemical Characteristics of 3D Printed ABS: Preliminary Results, Arielle J. Miller (*DNFSB*), Grant Warner, Dharmaraj Raghavan (*Howard University*)

Room-Temperature Electrodeposition of Aluminum Coating from 1-Ethyl-3-Methylimidazolium Tetrachloroaluminate Based Ionic Liquid Bath, Junhua Jiang, Congjian Wang (*INL*)

Creep Resistance of Additively Manufactured 316 Stainless Steel, Meimei Li, Xuan Zhang, Wei-Ying Chen, Florent Heidet (*ANL*), T. S. Byun, Kurt A. Terrani (*ORNL*)

Testing and Evaluation of Additively Manufactured TCR Core Materials, Thak Sang Byun, Maxim Gushev, Benton Garrison (*ORNL*), Meimei Li, Xuan Zhang (*ANL*), Kurt A. Terrani (*ORNL*)

Monte Carlo and Multiphysics

Sponsored by MCD. Session Organizer: Steven P. Hamilton (*ORNL*)

Improving Convergence via Removal of Scattering Ratio Threshold in Discrete Diffusion Monte Carlo, Alexis Maldonado (*Texas A&M*), Mathew A. Cleveland, Kelly G. Thompson (*LANL*)

Analysis of Mixed Cell Treatments for Multimaterial Nonlinear Radiation Diffusion, Pedram Ghassemi, Samuel P. Schofield (*LLNL*)

A Flexible Multi-Physics Coupling Scheme Between OpenMC and OpenFOAM, Lance Bullerwell, Jason Hou (*NCSU*)

A Pin-by-Pin Multi-Physics Code for PWR REA Simulation and Time Local Error Analysis, Alexey Cherezov, Deokjung Lee, Hanjoo Kim, Jinsu Park (*UNIST*)

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TUESDAY, JUNE 9
TECHNICAL SESSIONS - 1:30 PM

Reactor Analysis Methods—I

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

Advances in MCNP for Reactor Calculations, Robert Blake Wilkerson, Gregg W. McKinney, Colin Josey, M. E. Blood, J. D. Galloway, J. C. Armstrong, Holly R. Trellue (*LANL*)

Single Channel Design Based on Artificial Intelligence for Molten Salt Reactors, Mehmet Turkmen, Kathryn D. Huff (*Univ. Illinois*)

Development of FRENDY Nuclear Data Processing Code: Generation Capability of Multi-Group Cross Sections from ACE File, Akio Yamamoto, Tomohiro Endo (*Nagoya Univ.*), Kenichi Tada (*JAEA*)

Improving Resonance Integral Table Based Cross Section Methods Using Lasso Regression, Yuxuan Liu, Brendan M. Kochunas (*Univ. Michigan*)

Pitch Your Job—Panel

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions*)

More information to come.

TECHNICAL SESSIONS - 3:35 PM

Cyber Security for Nuclear Power Installations—II

Sponsored by HFICD; Cosponsored by NNPD. Session Organizer: Jamie Baalis Coble (*U.T., Knoxville*)

Nuclear Instrumentation and Control Simulation (NICSim) Platform for Investigating Cybersecurity Risks, Mohamed S. El-Genk, Timothy M. Schriener (*Univ. New Mexico*)

Programmable Logic Controller of a Pressurized Water Reactor Core Protection Calculator, Mohamed S. El-Genk, Andrew S. Hahn, Timothy M. Schriener (*Univ. New Mexico*)

Pressurizer Model and PLCs for Investigation of Cybersecurity of PWR Plants, Mohamed S. El-Genk, Ragai Altamimi, Timothy M. Schriener (*Univ. New Mexico*)

Steam Generator Model and Controller for Cybersecurity Analyses of Digital I&C Systems in PWR Plants, Mohamed S. El-Genk, Timothy M. Schriener (*Univ. New Mexico*)

Focus on Communications—I—Panel

Sponsored by ETWDD; Cosponsored by YMG. Session Organizer: Mimi H. Limbach (*Potomac Communications*)

More information to come.

Focus on Communications—II—Panel

Sponsored by ETWDD; Cosponsored by YMG. Session Organizer: Mimi H. Limbach (*Potomac Communications*)

More information to come.

Critical Heat Flux Experiments-Accident Tolerant Fuels—Panel

Sponsored by OPD. Session Organizer: Piyush Sabharwall (*INL*)

More information to come.

TUESDAY, JUNE 9

TECHNICAL SESSIONS - 3:35 PM

Impacts of the Change in the Definition of High-Level Waste—Panel

Sponsored by FCWMD. Session Organizer: Sven O. Bader (*Orano Federal Services*)

In October of 2018, a “Request for Public Comment on the U.S. Department of Energy Interpretation of High-Level Radioactive Waste” was issued, which provided DOE’s interpretation of the definition of the statutory term “high-level radioactive waste” (HLW). This interpretation essentially notes not all wastes from the reprocessing of spent nuclear fuel are HLW, and some may be classified as not HLW and may be disposed of in accordance with their radiological characteristics. The objective of this panel is to examine the direct implications (benefits and concerns) of this interpretation and the indirect implications of making such “practical” interpretations for the nuclear industry.

Panelists TBD

Thermal Hydraulics Challenges and Research Opportunities in Licensing Advanced Reactor Designs—Panel

Sponsored by THD. Session Organizer: Steven A. Arndt (*NRC*)

This panel will discuss key issues associated with licensing advance reactors and how uncertain in thermal hydraulics modeling of these new designs presents licensing challenges and research opportunities. Regulators through out the world are moving to a more performance base licensing process for advance reactors, but even with this change the details of how these reactors will work and how they will respond to transients and accidents needs to be modeled and these models will need to be validated. The panel with discuss the key challenge this presents.

Panelists:

Steven Arndt (*U.S. NRC*) (*tentative*)

Chul-Hwa SONG (*KAERI*) (*tentative*)

Additional speakers have been invited

From CAD to Transport for Radiation Protection and Shielding Calculations—I

Sponsored by RPSD. Session Organizer: Michael Lorne Fensin (*LANL*)

McCAD v1.0L An Improved CAD to MCNP Interface Library, Moataz S. Harb (*U.W., Madison*), Christian Wegmann, Ulrich Fischer (*KIT*)

McCad Plugin Developments for the SpaceClaim Software, Yuefeng Qiu, Ulrich Fischer (*KIT*)

Validation of Radiation Transport Methods for Ball Grid Array Inspection Systems, Michael Pfeifer, Nathanael Simerl, Ryan J. Strahler, Jack T. Casburn, Miranda L. Dodson (*Kansas State*), John Porter (*Honeywell*), Walter J. McNeil, Amir A. Bahadori (*Kansas State*)

From CAD to Nuclear Data S/U for Shielding Applications, Bor Kos, Robert E. Grove (*ORNL*), Ivan Alexander Kodeli (*Jozef Stefan Inst.*)

Radiation Transport with Moving Geometries and Sources Using DAGMC, Chelsea A. D'Angelo (*LANL*), Paul P. Wilson (*U.W., Madison*)

Experience with Automatic CAD to MCNP Model Conversion at ORNL's SNS, Igor Remec, Wei Lu (*ORNL*)

Advanced Manufacturing/Additive Manufacturing—II

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

In situ Mechanical Testing of AM 316L Steel -TCR Core Material, Maxim Gushev, Thak Sang Byun, Ryan R. Dehoff, Kurt A. Terrani (*ORNL*)

Evaluation of Heat Treatments for Additively Manufactured 316L, Joseph James Simpson (*ORNL*)

Modeling Time-Dependent Surrogates of Additive-Manufactured Nuclear Fuels Processes, Congjian Wang, Wen Jiang, Yipeng Gao (*INL*)

In-situ High-energy X-ray Study of Deformation Mechanisms in Additively Manufactured 316 Stainless Steel, Xuan Zhang, Meimei Li, Jun-Sang Park, Peter Kenesei, Jonathan Almer (*ANL*)

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TUESDAY, JUNE 9
TECHNICAL SESSIONS - 3:35 PM

Radiation Transport Software

Sponsored by MCD. Session Organizer: Steven P. Hamilton (*ORNL*)

DAG-OpenMC: CAD-Based Geometry in OpenMC, Patrick C. Shriwise (*ANL*), Xiaokang Zhang (*ASIPP*), Andrew Davis (*UKAEA*)

Extending MPACT to 2D Hexagonal Geometry, Kevin John Connolly, Aaron Marc Graham (*ORNL*)

Application of MATLAB PDE Toolbox for the IAEA-3D PWR Benchmark, Abiodun David Ajitotutu (*Texas A&M, Kingsville*)

Reactor Physics of Micro Reactors for Terrestrial and Space Applications—I

Sponsored by RPD; Cosponsored by ANSTD, OPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

Neutronics Analysis of Cold Critical KRUSTY Experiments Using MCNP and Serpent, Kristin N. Smith (*Texas A&M*), Jesson D. Hutchinson, Theresa E. Cutler, Rene G. Sanchez (*LANL*), Pavel V. Tsvetkov (*Texas A&M*)

Preliminary Study of Model Predictive Control for Load Follow Operation of Holos Reactor, Sooyoung Choi (*Univ. Michigan*), Shai Kinast (*NRCN*), Volkan Seker (*Univ. Michigan*), Claudio Filippone (*HolosGen*), Brendan M. Kochunas (*Univ. Michigan*)

LFR Core Design Concepts for Ice-Breaker, Seong-Jun Yoon, Myung Hyun Kim (*Kyung Hee Univ.*)

Linear Stability Analysis of HTR-like Micro-reactors, Doron Sivan (*Ben Gurion Univ.*), Shai Kinast (*Nuclear Research Center Negev*), Sooyoung Choi, Volkan Seker (*Univ. Michigan*), Erez Gilad (*Ben-Gurion Univ.*), Claudio Filippone (*HolosGen*), Brendan M. Kochunas (*Univ. Michigan*)

Innovating Nuclear through an Entrepreneurial Student Prize Competition—Panel

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions*)

More information to come.

WEDNESDAY, JUNE 10

TECHNICAL SESSIONS - 10:00 AM

General Topics in Instrumentation and Controls and Human Factors

Sponsored by HFICD. Session Organizer: Jamie Baalis Coble (*U.T., Knoxville*)

Control and Load Balancing with an IPWR Module to Support Deep Renewables Penetration, Richard J. Bisson, Jamie Baalis Coble (*U.T., Knoxville*)

Load Following Characteristics of Multi-Modular Reactors, Areai Nuerlan, Rizwan Uddin (*Univ. Illinois*), Fuyu Zhao (*Xi'an Jiaotong Univ.*)

Design of Control Systems for use in High Temperature Gas Reactors, Amanda M. Bachmann, Jamie Baalis Coble, Belle R. Upadhyaya (*U.T., Knoxville*)

Delivering the Nuclear Promise Through Human Factors Engineering, Timothy P. Tovar, Ryan Flamand (*NuScale Power*)

General Topics in Decommissioning

Sponsored by DESD. Session Organizer: James J. Byrne (*Byrne & Associates*)

Hydrogen Economy in Champaign-Urbana, IL, Roberto Fairhurst Agosta, Sam Dotson, Kathryn D. Huff (*Univ. Illinois*)

Mercury Remediation Process Optimization for Clayey Soil, Michael S. Smith (*UNC Charlotte*), Sven O. Bader (*Orano*), Thomas Koch (*UNC, Charlotte*), Arthur R. Niemoller (*Orano*)

Decommissioning of the Nuclear Power Demonstration Plant, Rolphton, Canada, Geoffrey W. R. Edwards, Frederick P. Adams (*CNL*)

Material Requirements for a Green New Deal, Barry L. Butterfield (*retired*), Daniel B. Bullen (*DNFSB*)

Energy Storage Systems and Integration with NPPs—I

Sponsored by OPD. Session Organizer: William Neal Mann (*Univ. Texas, Austin*)

Multi-Gigawatt-Day Low-Cost Crushed-Rock Heat Storage Coupled to Nuclear Reactors for Variable Electricity and Heat, Charles W. Forsberg (*MIT*)

Next-Generation Energy Storage Systems for SBO/ELAP Events, Rahul Jay (*City College of New York*)

Engineering a Voltage Buffer to Improve Offsite Power Reliability Independent of Telemetry or Operator Action, Stephen H. Shepherd (*Shepherd Hydricity*)

Chemical Treatment of Radioactive Waste

Sponsored by FCWMD. Session Organizer: Patricia D. Paviet (*PNNL*)

Examples of Technology Applicable to In-Situ Waste Characterization, Jean-Francois Lucchini, Derek Brigham, Beverly A. Crawford (*LANL*)

Digestion of Zircaloy Cladding for UNF Rods using Sulfur Chloride Reagents, Craig Barnes (*U.T., Knoxville*), G. D. (Bill) DelCul (*ORNL*), Breanna King Vestal (*U.T., Knoxville*)

Photodecomposition of Organoiodides to Molecular Iodine as Pretreatment for Adsorption, John Paul Stanford, Tejaswini Ravindra Vaidya, Vivek P. Utgikar, Krishnan Raja (*Univ. Idaho*), Piyush Sabharwall (*INL*)

Fenton-Like Process for Treatment of IRN-150 Resin with Simulated ^{14}C , Junsung Jeon, Wooyong Um, Muhammad Aamir Hafeez (*POSTECH*)

Removal of Sr^{2+} in Aqueous Solution Using MOF-1@MnO_2 Composites, Sang June Choi, Jung-Weon Choi (*Kyungpook National Univ.*)

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WEDNESDAY, JUNE 10
TECHNICAL SESSIONS - 10:00 AM

Challenges and Opportunities in Thermal Hydraulics of High Temperature Gas Cooled Reactors—Panel

Sponsored by THD. Session Organizer: Brian G. Woods (*Oregon State*)

Advanced high temperature gas cooled reactors typically rely on high pressure gas flows for heat removal during normal operations and a mix of natural convection, radiation and conduction for heat removal under postulated accident conditions. The combination of high heat capacity structures, relatively low power density, high Prandtl number low-density coolant, and multiple heat removal mechanisms offers significant advantages in terms of passive safety. However, this combination also requires the careful development, verification, and validation of experimental facilities, models and analysis tools that must accurately describe a wide range of flow conditions and heat transfer phenomena. This session provides an opportunity to review current efforts in modeling, simulation or experiments and identify current challenges and opportunities associated with the thermal hydraulics of these systems.

Panelists TBD

Meeting the Challenges in Non-LWR PRA Standard Development—Panel

Sponsored by NISD. Session Organizer: Matthew R. Denman (*Kairos Power*)

The licensing modernization process (LMP) provides a risk-informed framework to enable the efficient licensing of non-light water reactors. This panel will provide insights from the LMP authors, reactor designers, and the nuclear regulatory commission regarding how well the LMP is working and the future landscape of reactor licensing.

Panelists:

Dave Grabaskas (*ANL*)
Jordan Hagaman (*Kairos*)
Matthew Denman (*Kairos*)
Karl Fleming (*KNF Consulting Services*)

Sensors and In-Pile Instrumentation

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Optical Transmission of α -SiO₂ and α -Al₂O₃ Following High-Dose Neutron Irradiation, Christian M. Petrie (*ORNL*), Anthony Birri, Thomas E. Blue (*Ohio State*)

High Temperature Silicon-Carbide Furnace for Near Core Irradiation Experiments, Matthew P. Van Zile (*Ohio State*)

Designing an Impedance-Based Technique for Studying Corrosion on Cladding Materials, Ling Ding, Hongqiang Hu (*INL*), Michael F. Hurley (*Boise State*)

Compensation Scheme for Radiation-Induced Attenuation in Optical Fibers Interrogated Using Low-Coherence Interferometry, Daniel C. Sweeney, Christian M. Petrie, Adrian M. Schrell (*ORNL*)

In-Pile Loss of Coolant Accident Testing at TREAT, Nicolas Eric Woolstenhulme, Colby B. Jensen, Charles P. Folsom (*INL*), Robert J. Armstrong (*U.W., Madison*), David W. Kamerman, Daniel Michael Wachs (*INL*)

Acceleration Methods

Sponsored by MCD. Session Organizer: Steven P. Hamilton (*ORNL*)

Assessing the Effectiveness of Acceleration Methods for Deterministic Neutron Transport Solvers, Joshua S. Rehak, Rachel N. Slaybaugh (*U.C., Berkeley*)

Stability Analysis of CMFD Acceleration and Linear Prolongation for Weighted Linear Difference Schemes, Rodolfo M. Ferrer (*Studsvik Scandpower*)

A Hybrid Neutronics Method with Diffusion Synthetic Acceleration for k-eigenvalue Problem, Jiahao Chen, Jason Hou (*NCSU*)

Hybrid Parallel Computing of Solving 3D Multi-Group Neutron Diffusion Equation via Multi-Leel CMFD Acceleration, Shunjiang Tao, Yunlin Xu (*Purdue Univ*)

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WEDNESDAY, JUNE 10

TECHNICAL SESSIONS - 10:00 AM

Reactor Physics of Advanced Reactors

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

A Gas-Cooled Water Moderated Thermo-Electric Reactor Concept, Anatoly Blinovskiy (*Westside Environmental Technol.*)

Modelling of the HTR-PM Pebble-Bed Reactor Using OpenMC, Jiankai Yu (*MIT*), Qiudong Wang, Ding She (*Tsinghua Univ.*), Benoit Forget (*MIT*)

Multi-Physics Coupling of PROTEUS-NODAL and SAM for MSR Simulation Under MOOSE Framework, Gang Yang, Mustafa Jaradat, Hansol Park, Won Sik Yang (*Univ. Michigan*), Changho Lee (*ANL*)

Application of Disk-type Burnable Absorber in the Soluble-Boron-Free ATOM Core, Ha Xuan Nguyen, Seongdong Jang, Yonghee Kim (*KAIST*)

Dynamic Analysis of Molten Salt Reactor with Coupled Point Kinetics and Thermal-Hydraulics Model, Yeong Shin Jeong, Koroush Shirvan (*MIT*)

Balancing Competition and National Needs in the Medical Isotopes Market—Panel

Sponsored by NCS. Session Organizer: Joseph A. Christensen (*SHINE Medical Technologies*)

This session addresses the growing field of medical isotope production and the implications for criticality safety. The field involves a number of emerging techniques and technologies which produce criticality safety challenges, INCLUDING handling high-assay low-enriched uranium in known or new chemical compositions. These challenges create opportunities for advancements in criticality safety techniques and demonstrate a continuing need for nuclear data. This panel is designed to highlight challenges, advancements, and current or future needs in the field of criticality safety for medical isotope production facilities.

Panelists TBD

TECHNICAL SESSIONS - 1:30 PM

Online Monitoring and Prognostics

Sponsored by HFICD. Session Organizer: Jamie Baalis Coble (*U.T., Knoxville*)

Using Auxiliary Particle Filter to Estimate Remaining Useful Life, Hang Xiao, Jamie Baalis Coble, J. Wesley Hines (*U.T., Knoxville*)

Drywell Cooling Fan Anomaly Detection Using Machine Learning Methods, Ahmad Al Rashdan, Michael Griffel, Donna P. Guillen, Roger Boza (*INL*)

Progress Toward Molten Salt Reactor Heat Exchanger On-Line Monitoring, S. W. Glass, M. S. Good, E. L. Forsi, R. O. Montgomery (*PNNL*)

Resume/CV Workshop

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions*)

More information to come.

Energy Storage Systems and Integration with NPPs—II

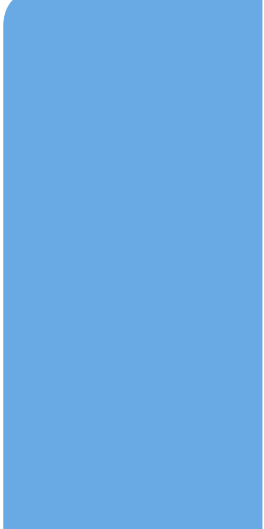
Sponsored by OPD. Session Organizer: William Neal Mann (*U.T., Austin*)

Base-Load Light-Water Reactors with Variable Electricity Using Crushed-Rock Heat Storage and Steam Peaking Plant with High-Efficiency Steam Injectors, Charles W. Forsberg (*MIT*), Tadashi Narabayashi (*Tokyo Inst Technol*)

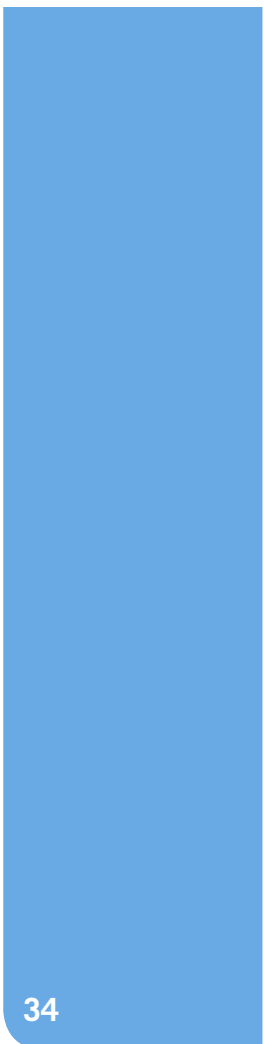
System Efficiency and Dynamic Study of $\text{Ca(OH)}_2/\text{CaO}$ Chemical Heat Pump, Aman Gupta, Vivek P. Utgikar (*Univ. Idaho*), Paul Duncan Armatis, Brian Matthew Fronk (*Oregon State*), Piyush Sabharwall (*INL*)

Separating Nuclear Reactors from the Power Block with Heat Storage: A New Power Plant Design Option—Workshop Summary, Charles W. Forsberg (*MIT*), Piyush Sabharwall (*INL*), Andrew G. Sowder (*EPRI*)

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WEDNESDAY, JUNE 10
TECHNICAL SESSIONS - 1:30 PM

Lessons Learned from NNSA Consortias–Panel

Sponsored by NNPD. Session Organizer: Stefani Buster (*NCSU*)

Over the past decade, the National Nuclear Security Administration (*NNSA*) has employed the consortium model to manage the academic portfolio that helps advance its nuclear science and security goals. A collaboration between the US Department of Energy, universities, and national laboratories, the consortia serve to develop talent and capabilities that will aid the US in meeting its nonproliferation challenges both present and future. This panel proposes to bring together representatives from the NNSA, universities, and the national laboratories to share highlights and discuss their experiences under the consortium model.

Panelists TBD

Thermal Hydraulics of Nuclear Micro-Reactors and MSR

Sponsored by THD. Session Organizer: Caleb S. Brooks (*Univ. Illinois*)

Microreactor Safety Analysis: Requirements, Considerations and Potential Impact, Rohan Milind Biwalkar, Sola Talabi (*Pittsburgh Technical*), Kenneth Redus (*Redus and Associates*)

Assessment of the Thermal-Structural Characteristics of Core Components in a Preconceptual Design of the Transformational Challenge Reactor, Casey J. Jesse, James W. Sterbentz (*INL*), Benjamin R. Betzler (*ORNL*)

Design of a Flat Channel Experiment to Study Molten Salt Thermal Radiation Heat Transfer, Pablo R. Rubiolo (*Grenoble Institute of Technology*), Julien Giraud, Veronique Ghetta, Mauricio Tano, Juan Blanco, Francisco Kovacevich (*LPSC, Université Grenoble-Alpes*)

Managing Hydrogen Systems in Nuclear Facilities: Lessons Learned from the DOE Complex and Industry–Panel

Sponsored by NISD. Session Organizer: Kevin R. O’Kula (*Amentum Technical Services*)

In 2019, the U.S. Department of Energy (DOE) announced three first-of-a-kind projects designed to improve the long-term economic competitiveness of the nuclear power industry. Three commercial electric utilities and Idaho National Laboratory were chosen to adapt existing nuclear power plants to demonstrate hydrogen production. While the successful demonstration of the technology has significant beneficial implications for primary energy, transport and storage sectors in the U.S., there are safety issues that must be addressed. This panel will discuss past and contemporary DOE and industry experience and the insights gained regarding hydrogen in nuclear and non-nuclear facilities, and supporting systems/structures/components. The panel member composition is designed represent a wide spectrum of experience and expertise in understanding and addressing the technical issues, and managing safety challenges posed by hydrogen.

Panelists

Nick Barilo (*Center for Hydrogen Safety, Pacific Northwest National Laboratory*)

Dr. David H. Cook (*High Flux Isotope Reactor, Oak Ridge National Laboratory*)

Dr. Joseph E. Shepherd (*Caltech*)

Additional panelists to be named

Accelerated Materials Discovery

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

A Molecular Dynamics Study of Cr-Rich Precipitates in Model Fe-Cr-Al Alloys Under Cascade Damaged Conditions, Xichuan Liao, Huiqiu Deng, Yangchun Chen (*Hunan Univ.*), Fei Gao (*Univ. Michigan*)

Computational Analysis of Rhenium (I) Complex, Allison McKee, Meheret Tadesse (*Univ. Houston*)

Development of Yttrium Hydride Moderator for the Transformational Challenge Reactor, Xunxiang Hu, Chinthaka M. Silva, Kurt A. Terrani (*ORNL*)

Transient Grating Spectroscopy Rapidly Screening Steels for Swelling Resistance, Nouf M. Almousa, Michael Philip Short (*MIT*)

WEDNESDAY, JUNE 10

TECHNICAL SESSIONS - 1:30 PM

Aging of Materials

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Evaluation Methods of Fatigue in Nuclear Power Design, Donghui Wang, Qingna Zeng (*Nuclear Power Institute of China*)

Development of Cable Aging Acceptance Criteria for Nuclear Facilities, Patrick Ellis, Gary Harmon, Patrick Ward, Codi Ferree, Brent D. Shumaker (*AMS*)

Application of Condition Monitoring Technologies for Aging Electrical Cables, Trevor Aaron Toll, Bryan McConkey, Patrick Ellis, Elijah Connatser, Brent D. Shumaker (*AMS*)

Reactor Physics of Micro Reactors for Terrestrial and Space Applications—II

Sponsored by RPD; Cosponsored by ANSTD, OPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

Depletion Analysis of a Micro-Reactor Annular Heat Pipe Fuel Element, Alec William Golas, Stephanie Astudillo-Gomez, Subash L. Sharma (*U.M., Lowell*)

Mini-SMR-21 in Once-Through Long-Lived Fuel Cycle Feasibility, Gray S. Chang (*JFoster & Associates*)

A Numerical Tool for Space Nuclear Reactor Design Based on Molten Salt Reactors (*MSRs*), Pablo R. Rubiolo (*Grenoble Institute of Technology*), Mauricio Tano, Juan Blanco, Veronique Ghetta, Julien Giraud, Valentin Richard (*Univ. Grenoble-Alpes*)

Optimal Sizing of a Micro-Reactor for Embedded Grid Systems, Samuel G. Dotson, Kathryn D. Huff (*Univ. Illinois*)

ANS-8 Standards Forum

Sponsored by NSCD. Session Organizer: Douglas G. Bowen (*ORNL*)

Subcommittee ANS-8, Operations with Fissile Material Outside Reactors, meets to discuss various technical and administrative aspects of the approximately 20 national consensus standards under its purview. In addition to status and progress updates by representatives of individual working groups, formal presentations on the technical bases of numerical values such as subcritical limits and experiences with applications of particular standards are solicited. Agenda topics such as new and expanded standards are also encouraged.

TECHNICAL SESSIONS - 3:35 PM

Digital Instrumentation and Control

Sponsored by HFICD. Session Organizer: Jamie Baalis Coble (*U.T., Knoxville*)

Automated Functional Testing for Nuclear Digital Instrumentation and Control Systems, Brent D. Shumaker, Gregory Wayne Morton, Dan E. McCarter, Chris Maddux (*AMS*)

Study on the Test Approach and Development of APR1400 Training Simulator with Virtual DCS, SungKon Kang (*KHNP*), Min Seok Kim, Kyung Min Kim (*Korea Hydro Nuclear Power Co., LTD*)

Development of a NPP VDCS verification platform, Xinyu Wei, JunYan Qing, Peiwei Sun, Qian Ma, Haowei Sun (*Xi'an Jiaotong University*)

Carbon Pricing and Clean Energy Standards 101—Panel

Sponsored by YMG. Session Organizer: Timothy M. Crook (*MCR Performance Solutions, LLC*)

More information to come.

Technical
Sessions:
Wednesday
June
10

WEDNESDAY, JUNE 10
TECHNICAL SESSIONS - 3:35 PM

Operations and Power: General

Sponsored by OPD. Session Organizer: William Neal Mann (*Univ. Texas, Austin*)

Particle Filtering Effect of Charcoal in ACU on the Hanul NPP Unit 1, Jongkuk Lee, Kyoung-Woo Choi, Jung-Jun Lee, Jae-Do Lee (*KINS*)

Stochastic Analysis for Long Term Capital SSC Refurbishment and Replacement, Congjian Wang, Diego Mandelli (*INL*), David Morton (*Northwestern*), Ivilina Popova (*Texas State Univ.*), Stephen M. Hess (*Jensen Hughes*), Shawn W. St. Germain, Curtis L. Smith (*INL*)

Effective Nuclear Plant Waste Heat Utilization by a Cryogenic Cycle, Alex Kravets (*Veritask Energy Systems*), Donald N. Grace (*Vogtle Monitoring Group*)

IAEA Activities to Facilitate Near Term Deployment of SMRs, Frederik Reitsma, M. Hadid Subki, Gerardo Martinez-Guridi (*IAEA*)

Integration of U.S. National and ISO International Standards to Support Advanced Reactors, Donald J. Spellman (*Xcel Engineering*), George Flanagan (*ORNL*), Mike Brisson (*SRNL*)

Fuel Cycle and Waste Management: General

Sponsored by FCWMD. Session Organizer: Stephanie H. Bruffey (*ORNL*)

Assessment of Feasibility of Using Advanced, Non-Conventional Fuels in a Pressure-Tube Heavy Water Reactor (a Gen-III+ Technology) to Destroy Long-Lived Fission Products, Blair P. Bromley, Ashlea V. Colton (*CNL*)

DANESS v9: Dynamic Analysis of Advanced Nuclear Energy Systems, Luc G. G. Van Den Durpel (*Nuclear-21*)

Past, Present, and Future Aspects of CANDU Fuel Development in Korea, Joo Hwan Park (*KAERI*)

SNF Consumption and Disposal Using the Mu*STAR Molten-Salt Accelerator-Driven Subcritical Reactor, Rolland P. Johnson, Mary Anne Cummings, Julio D. Lobo, Thomas J. Roberts, Robert J. Abrams (*Muons*)

Avoiding Kiloton Explosions at WIPP from Radiolytic Gas Production, Charles D. Bowman (*The ADNA Corporation*)

Thorium: Uses, Resources, and Origination, John H. Kutsch (*Terrestrial Energy USA*)

Computational Thermal Hydraulics—II

Sponsored by THD. Session Organizer: Elia Merzari (*Penn State*)

Validation of the 1-D Thermal Stratification Model in Gallium Environment, Cihang Lu, Zeyun Wu (*Virginia Commonwealth*), Brendan C. Ward, Hitesh Bindra (*Kansas State*)

Cooling Channel Optimization in Additively Manufactured Gas-Cooled Reactor Core, Justin Weinmeister, Prashant K. Jain (*ORNL*)

Multi-Scale & Multi-Physics Analysis of PWR Steam Line Break Accident, Jae Ryong Lee, Han Young Yoon, Ik Kyu Park (*KAERI*)

Sodium Fire Models for In- and Ex-Vessel Safety Analysis Code SPECTRA, Mitsuhiro Aoyagi, Akihiro Uchibori, Takashi Takata, Hiroyuki Ohshima (*JAEA*)

Code Validation for SBLOCA Test of PHWR Using MARS-KS, Kyunglok Baek, Seon Oh Yu (*KINS*)

Technical
Sessions:
Wednesday
June
10

WEDNESDAY, JUNE 10

TECHNICAL SESSIONS - 3:35 PM

Uranium Mine Reclamation—Panel

Sponsored by DESD. Session Organizer: James J. Byrne (*Byrne & Associates*)

The Uranium Mill Tailings Remedial Action (UMTRA) Project was created by the United States Department of Energy (DOE) to monitor the cleanup of uranium mill tailings. In 1978 the US Congress passed the Uranium Mill Tailings Radiation Control Act (UMTRCA) which tasked the DOE with the responsibility of stabilizing, disposing, and controlling uranium mill tailings and other contaminated material at uranium mill processing spread across 10 states and at approximately 5,200 associated properties. This session will explore the progress of this effort and explore lessons learned that could be applied to other legacy sites.

Panelists:

Stuart Walker (*U.S. EPA*)

Jodi Waugh (*U.S. DOE*)

Daniel Yazzie (*Navajo Nation Environmental Protection Agency*)

Nuclear Fuels—I

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Structural Materials Investigations for the Westinghouse Lead Fast Reactor, Michael R. Ickes, Paolo Ferroni (*Westinghouse*)

Fabrication and Characterization of High-Zirconium Content Fuel Slugs for Fast Reactor, Jong-Hwan Kim, Ki-Hwan Kim, Seoung-Woo Kuk, Jeong-Yong Park, June-Hyung Kim, Jin-Sik Cheon (*KAERI*)

Re-Fabrication of U-10wt.%Zr Fuel Slugs Containing Rare-Earth Elements Recycling Metallic Fuel Scraps, Ki-Hwan Kim (*KAERI*), Seung-Uk Mun (*Chungnam National Univ.*), Seoung-Woo Kuk, Jeong-Yong Park, Jin-Sik Cheon (*KAERI*)

The Impact of Model Parameters and Local Conditions on the Hydrogen Migration and Redistribution Model in Bison, Seokbin Seo, Edward Matthew Duchnowski, Nicholas R. Brown (*U.T., Knoxville*)

Sensitivity, Uncertainty, and Machine Learning

Sponsored by MCD. Session Organizer: Steven P. Hamilton (*ORNL*)

Bayesian Parameter Estimation of Neutron Multiplicity Counting Equations, Philippe Humbert (*CEA*)

Analysis of Modeling Uncertainty Impacts on Nuclear Data Uncertainty Propagation in Core Simulation, Dongli Huang, Hany S. Abdel-Khalik (*Purdue Univ.*)

Addressing Ambiguities in Constrained Sensitivity Analysis for Reactor Physics Problems, Jeongwon Seo, Hany S. Abdel-Khalik (*Purdue Univ.*), Zoltan Perko (*Delft Univ. Technol.*)

Material Classification Using Non-Optical Imaging, Graph Laplacian and Support Vector Machine Learning, Molly Ross, Hitesh Bindra (*Kansas State*)

Technical
Sessions:
Wednesday
June
10

WEDNESDAY, JUNE 10
TECHNICAL SESSIONS - 3:35 PM

Reactor Analysis Methods—II

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

Analytic Treatment of Intra-Fuel-Rod Temperature Distributions in the GPU-Based Continuous Energy Monte Carlo Code PRAGMA, Namjae Choi, Han Gyu Joo (*Seoul Natl. Univ.*)

Low Power Transient Analysis for Initial Subcritical PWR with External Neutron Source via 3-D Nodal Diffusion Code RAST-K, YuGwon Jo, Ho Cheol Shin (*KHNP CRI*)

The Application of the Backward Differentiation Formula on the Transient Coupling of Three-Dimensional Neutron Kinetics and Thermal Hydraulics, Yun Cai (*National Tsinghua Univ.*), Xingjie Peng, Qing Li, Yingrui Yu, Rui Guo (*Nuclear Power Institute of China*)

Adjoint Driven Ex-Core Response Estimation in PWR with Thermal Feedback, Shane Henderson (*NCSU*), Tara M. Pandya, Shane G. Stimpson (*ORNL*)

Frequency Transform Method for Transient Analysis of Nuclear Reactors, Miriam A. Kreher, Samuel C. Shaner, Benoit Forget, Kord S. Smith (*MIT*)

New Developments in Shipping Packages Related to Criticality Safety—Panel

Sponsored by NCSD. Session Organizer: Marvin H. Barnett (*SRNL*)

Over the last decade(s) there have been many new Type A and Type B shipping packages designs and new allowed fissile contents. Both ANSI/ANS Standards and the Code of Federal Regulations require an evaluation of criticality safety for each combination of shipping package configuration and content. The purpose of this session is to provide a discussion of the unique challenges and requirements for criticality safety during both transport and storage of shipping packages.

Panelists TBD

Technical
Sessions:
Wednesday
June
10

THURSDAY, JUNE 11
TECHNICAL SESSIONS - 8:00 AM

Experimental Thermal Hydraulics—II

Sponsored by THD. Session Organizer: Igor A. Bolotnov (*NCSU*)

Thermal Property Test Study of Pellet to Cladding Interaction in CFR600 Design, Yan Peng (*China Institute of Atomic Energy*)

Design and Verification Testing for Metallic Fuel Relocation Experiments with Pressure Injection in a Pin Bundle Core Structure of a Sodium-Cooled Fast Reactor, Tae Il Kim, Dzmitry Harbaruk, Darius Lisowski, Nathan Bremer, Mitchell Farmer, Christopher Grandy, Yoon Il Chang (*ANL*)

Investigation of Natural Convection in Vertical Parallel Plates Including the Thermal Radiation Effect Under High Wall Temperature Conditions, Koung Moon Kim (*Incheon National Univ.*), Dong-Wook Jerng (*Chung-Ang Univ.*)

Measurements of Pressure Drop in Pipes with Twisted Tape Inserts for Molten Salt Reactor Applications, Cody S. Wiggins, Arturo Cabral, Meryem Murphy, Candler Langston, Lane B. Carasik (*Virginia Commonwealth*)

ANS Position Statement on the Use of Low Enriched Uranium in Space—Panel

Sponsored by ANSTD. Session Organizer: Jeffrey C. King (*CSM*)

More information to come.

Nuclear Fuels—II

Sponsored by MSTD. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Performance Analysis of Silicon Carbide Composite Clad Uranium Carbide Fuel During Reactivity Initiated Accident, Hangbok Choi, John M. Bolin (*General Atomics*)

Microstructural Analysis of the SiC Layer of Tristructural-Isotropic Particles in High-Temperature Steam Atmospheres, Katherine Isabel Montoya, Brian A. Brigham (*U.T., San Antonio*), Tyler J. Gerczak (*ORNL*), Elizabeth Sooby Wood (*U.T., San Antonio*)

Using Machine Learning to Predict the Oxidation of Graphite, Cole Moczygemba, Michael Geyer, Amanda Fernandez, Elizabeth Sooby Wood (*U.T., San Antonio*)

Oxidation Behavior of Silicon Carbide and Graphitic Materials for TRISO Fuel Application, Haiming Wen, Adam Bratten (*Missouri Univ. S&T*)

Robotics and Remote Systems: General

Sponsored by RRS. Session Organizer: Leonel E. Lagos (*Florida International University*)

Application of Motion Primitives to Train Robotic Behaviors for Nuclear Facility D&D, Young Soo Park, Jonathan Bayert, Dongjune Chang (*ANL*), Sungmoon Joo, Jonghwan Lee (*KAERI*)

A Drone-Based Automated Radiation Surveillance System, Abdulrahman M. Riyadhha, Ahmad M. Elshoubaky, Jamil A. Rihani, Mohammad Al-Shabi, Walid A. Metwally, Bassam A. Khuwaileh (*Univ. Sharjah*)

Reactor Analysis Methods—III

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

A Unified Form of Stabilized Finite Element Methods for Solving the First-Order Neutron Transport Equation, Liangzhi Cao, Chao Fang, Hongchun Wu (*Xi'an Jiaotong Univ.*)

Relaxation of Quasi-Static Approach via Polynomial Interpolation in the Predictor Corrector Quasi-Static Method, Taesuk Oh, Yonghee Kim (*KAIST*)

Unstructured Mesh-Grid Multi-Physics Analysis with Monte Carlo iMC Code for Advanced Fuel Elements, Hyeontae Kim, Yonghee Kim (*KAIST*)

Conceptual Safety Design Report for the Versatile Test Reactor, Douglas M. Gerstner (*Battelle Energy Alliance/INL*), Jason P. Andrus (*INL*), Troy P. Reiss (*Battelle Energy Alliance*)

An Approach to the Experimental Validation of the Fission Multiplying Blanket of FFH Systems, Mario Carta (*ENEA*), M. Salvatores, F. Orsitto (*Napoli Univ.*), N. Burgio, V. Fabrizio, L. Falconi, M. Palomba, F. Panza (*ENEA*)

Technical
Sessions:
Thursday
June
11

THURSDAY, JUNE 11
TECHNICAL SESSIONS - 10:15 AM

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

Sponsored by NCS. Session Organizer: Vladimir Sobes (*U.T., Knoxville*)

The Effect of ENDF/B-VIII.0 on Jezebel, Jeffrey A. Favorite (*LANL*)

Impact of Increased Enrichment on Nuclear Analysis Accuracy Due to Cross-Section Uncertainties, Dale B. Lancaster (*NuclearConsultants.com*), Charles T. Rombough (*CTR Technical Services*), Fred H. Smith (*EPRI*)

Application of Bootstrap Method to Estimated Criticality Lower-Limit Multiplication Factor Considering Nuclear Data-Induced Uncertainty, Takuto Hayashi, Tomohiro Endo, Akio Yamamoto (*Nagoya Univ.*)

Implementation of Whisper-Based Validation at the Hanford Tank Farms, Alyssa R. Kersting (*AECOM*)

Design of a Critical Experiment to Validate Yttrium Hydride at Varying Temperatures, Theresa E. Cutler, Travis J. Grove (*LANL*), Kelsey Amundson (*DNFSB*), Holly R. Trellue (*LANL*)

Nuclear Fuels—III

Sponsored by MST. Session Organizer: Kenneth J. Geelhood (*PNNL*)

Analysis of Graphite Matrix Kinetics and Burn-Off Products Under Off-Normal High-Temperature Gas-Cooled Reactors Conditions, Brian Brigham, Katherine I. Montoya (*U.T., San Antonio*), Tyler J. Gerczak (*ORNL*), Elizabeth Sooby Wood (*U.T., San Antonio*)

Computational Screen and Experimental Validation of Lanthanide-Binding Additives in Metallic Fuels, Yi Xie, Chao Jiang, Michael T. Benson (*INL*)

Stress Profile in Coating Layers of TRISO Fuel Particles in Contact with One Another, Daniel Schappel, Kurt A. Terrani (*ORNL*)

Fabrication and Characterization Methodology of Transformational Challenge Reactor Fuel Form, Gokul Vasudevamurthy, Dylan Richardson, Micheal Trammell, Brian Jolly, Andrew Nelson, Grant Helmreich, Austin Schumacher (*ORNL*), Trevor Smuin (*INL*), Kurt Terrani (*ORNL*)

Reactor Physics Design, Validation, and Operational Experience

Sponsored by RPD. Session Organizer: Pavel V. Tsvetkov (*Texas A&M*)

Azimuthal Power Tilts in Quadrant Symmetric Reactors, James C. Brittingham (*Individual*)

Neutronics Benchmark of CEFR Start-up Tests with SuperMC, Yanting Sun, Bo Chang, Bin Li, Qi Yang, Bin Wu (*Institute of Nuclear Energy Safety Technology*)

UUTR Unit Cell Calculations with PENTRAN (S_N) and MCNP6 for Activation Foil Validation Studies, Meng-Jen Wang, Glenn E. Sjoden (*Univ. Utah*)

Neutronic Consideration of TREAT Facility Fuel SiC Recladding, John D. Bess, Nicolas Eric Woolstenhulme (*INL*)

Monte Carlo Transient Analysis of C5G7-TD Benchmark 3D Problems Using McCARD, Sang Hoon Jang, Hyung Jin Shim (*Seoul Natl Univ.*)

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

Sponsored by NCS. Session Organizer: Vladimir Sobes (*U.T., Knoxville*)

Description and Use of SCALE Sampler Parametric Capability for Engineering Analysis and Optimization, William J. Marshall, Travis Mitchell Greene (*ORNL*), Bret David Brickner (*Holtec*), Robert Hall (*ORNL*)

Performing k_{eff} Validation of As-Loaded Criticality Safety Calculations Using UNF-ST&DARDS: Applicable Experiment Selection, William J. Marshall, Justin B. Clarity, Kaushik Banerjee (*ORNL*)

Performing k_{eff} Validation of As-Loaded Criticality Safety Calculations Using UNF-ST&DARDS: Sensitivity Calculations, William J. Marshall, Justin B. Clarity, Kaushik Banerjee (*ORNL*)

Effects of Fabrication Tolerances on Margins to Safety Limits for MITR LEU Conversion, Dakota Allen, Kaichao Sun, Akshay Dave, Lin-Wen Hu (*MIT*), David Jaluvka, Son Hong Pham, Erik H. Wilson (*ANL*)

Criticality Safety Analysis, Shaikha Ahmed AlShamsi (*Nawah Energy*), Walid A. Metwally, Batool M. Madani (*Univ. Sharjah*)

Technical
Sessions:
Thursday
June
11

Committee Meetings

NATIONAL COMMITTEES

Accreditation Policies & Procedures

SUNDAY, 10 AM – 11 AM

ANS Annual Business Meeting

WEDNESDAY, 5:45 PM – 7 PM

Board of Directors

ANS Board of Directors

WEDNESDAY, 4 PM – 5:30 PM

ANS Board of Directors

THURSDAY, 7:30 AM – 4:30 PM

Bylaws & Rules

SUNDAY, 4 PM – 5:30 PM

Finance Meeting

TUESDAY, 1 PM – 5 PM

Honors & Awards

MONDAY, 4 PM – 6 PM

International

SUNDAY, 11:30 AM – 1 PM

Local Sections Committee Workshop

SUNDAY, 9:30 AM – 12 PM

National Program

NPC Screening

SUNDAY, 10 AM – 12 PM

NPC National Meeting Subcommittee

TUESDAY, 11:30 AM – 1 PM

NPC Program

TUESDAY, 5:30 PM – 7:30 PM

NEED

MONDAY, 11 AM – 12 PM

President's Meeting w/Committee Chairs & Division Chairs

SUNDAY, 8 AM – 9:30 AM

Professional Divisions Committee

TUESDAY, 4 PM – 5:30 PM

Professional Engineering Exam

PEEC Item Writers Group

SATURDAY, 5 PM – 10 PM

PEEC Exam Prep Subcommittee

SUNDAY 9 AM – 10 AM

PEEC Committee

SUNDAY, 4 PM – 6 PM

Public Policy

TUESDAY, 2 PM – 3 PM

Publications Steering

Meetings, Proceedings & Transactions

SUNDAY, 9 AM – 10 AM

Book Publishing

SUNDAY, 11 AM – 12:30 PM

Publications Steering Committee

MONDAY, 4:30 PM – 6:30 PM

FS&T Editorial Advisory Committee

SUNDAY, 4:30 PM – 5:30 PM

NATIONAL COMMITTEES

Publications Steering Continued

Technical Journals

SUNDAY, 1 PM – 4 PM

Nuclear Technology Editorial Advisory

SUNDAY, 4:30 PM-5:30 PM

NS&E Editorial Advisory

SUNDAY, 4:30 PM-5:30 PM

Scholarship Policy & Coordination

MONDAY, 12 PM – 1 PM

Student Sections

Executive

MONDAY, 6 PM – 8 PM

SPECIAL COMMITTEES

Special Committee on Congressional Fellow

WEDNESDAY, 3:30 PM – 4:30 PM

OTHER COMMITTEES

Christian Nuclear Fellowship

MONDAY, 7 PM – 9 PM

NEDHO

SUNDAY, 4 PM – 6 PM

DIVISION COMMITTEES

Accelerator Applications

Executive

MONDAY, 11:30 AM – 1:30 PM

Aerospace Nuclear Science & Technology

Executive

SUNDAY, 12 PM – 1 PM

Decommissioning and Environmental Sciences

Program

SUNDAY, 3:30 PM – 4:30 PM

Executive

SUNDAY, 4:30 PM – 5:30 PM

Education, Training & Workforce Development

Program

SUNDAY, 10:30 AM – 12 PM

Alpha Nu Sigma

SUNDAY, 1 PM – 2 PM

Executive

SUNDAY, 2 PM – 4 PM

Fuel Cycle & Waste Management

Program

SUNDAY, 12 PM – 1 PM

Executive

SUNDAY, 1 PM – 2:30 PM

Committee Meetings

DIVISION COMMITTEES

Human Factors, Instrumentation, and Controls

Executive

SUNDAY, 12 PM – 2:30 PM

Isotopes and Radiation

Executive

SUNDAY, 1 PM – 2:30 PM

Mathematics & Computation

Program

SUNDAY, 1 PM – 2 PM

Executive

SUNDAY, 2 PM – 4 PM

Nuclear Criticality Safety

Education

SUNDAY, 1 PM – 2 PM

Program

SUNDAY, 2 PM – 3 PM

Executive

SUNDAY, 3 PM – 4:30 PM

Nuclear Nonproliferation Policy

Program

SUNDAY, 3 PM – 3:30 PM

Executive

SUNDAY, 3:30 PM – 4:30 PM

Operations & Power

Program

SUNDAY, 3 PM – 4 PM

Executive

SUNDAY, 1 PM – 2:30 PM

Reactor Physics

Program

SUNDAY, 2 PM – 4 PM

Executive

SUNDAY, 4 PM – 6 PM

Thermal Hydraulics

Program

SUNDAY, 2:30 PM – 4:30 PM

Executive

SUNDAY, 4:30 PM – 6 PM

Young Members Group

Program

MONDAY, 11 AM – 12 PM

Executive

MONDAY, 12:30 PM – 1:30 PM

Retention Committee

MONDAY, 10:30 AM – 11 AM

STANDARDS COMMITTEES

ANS-3.15, Cybersecurity

SUNDAY, 3 PM – 4 PM

ANS-8.1, Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors

MONDAY, 8 AM – 10 AM

ANS-8.10, Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement

MONDAY, 11:30 AM – 1 PM

ANS-8.17, Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors

TUESDAY, 7:30 AM – 8:30 AM

ANS-8.22, Nuclear Criticality Safety Based on Limiting and Controlling Moderators

MONDAY, 10 AM – 11 AM

ANS-8.28, Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety

TUESDAY, 3 PM – 5 PM

ANS-8.3, Criticality Accident Alarm System

MONDAY, 10 AM – 11:30 AM

ANS-8.7, Nuclear Criticality Safety in the Storage of Fissile Materials

MONDAY, 4 PM – 6 PM

ANS-19, Reactor Physics Subcommittee

MONDAY, 9 AM – 10:30 AM

ANS-19.3, Steady-State Neutronics Methods for Power Reactor Analysis

MONDAY, 8 AM – 9 AM

Fuel, Waste, and Decommissioning Consensus Committee (FWDCC)

MONDAY, 10 AM – 12 PM

Nonreactor Nuclear Facilities Consensus Committee (NRNFCC)

MONDAY, 8 AM – 10 AM

Risk-informed, Performance-based Principles and Policy Committee (RP3C)

MONDAY, 3 PM – 6 PM

Standards Board

TUESDAY, 8:30 AM – 5 PM

Committee/Division/Other Meetings Daily

Saturday, June 6

5:00 pm - 10:00 pm Professional Engineering Exam Committee-Item Writers Group

Sunday, June 7

8:00 am - 9:30 am President's Meeting with Committee & Division Chairs
9:00 am - 10:00 am Publications Steering-Meetings, Proceedings & Transactions Committee
9:00 am - 10:00 am PEEC Exam Prep Subcommittee
9:30 am - 12:00 pm Local Sections Committee Workshop
10:00 am - 12:00 pm National Program Committee-NPC Screening
10:30 am - 12:00 pm Education, Training & Workforce Development Division-Program Committee
10:00 am - 11:00 am Accreditation Policies & Procedures Committee
11:00 am - 12:30 pm Publications Steering Committee-Book Publishing
11:30 am - 1:00 pm International Committee
12:00 pm - 1:00 pm Aerospace Nuclear Science & Technology – Executive Committee
12:00 pm - 1:00 pm Fuel Cycle & Waste Management Division-Program Committee
12:00 pm - 2:30 pm Human Factors, Instrumentation & Controls Division-Executive Committee
1:00 pm - 2:00 pm Education, Training & Workforce Development Division - Alpha Nu Sigma National Honor Society
1:00 pm - 2:00 pm Mathematics & Computation Division-Program Committee
1:00 pm - 2:00 pm Nuclear Criticality Safety Division-Education Meeting
1:00 pm - 2:30 pm Operations & Power Division-Executive Committee
1:00 pm - 2:30 pm Fuel Cycle & Waste Management Division-Executive Committee
1:00 pm - 2:30 pm Isotopes & Radiation Division-Executive Committee
1:00 pm - 4:00 pm Publications Steering Committee-Technical Journals
2:00 pm - 3:00 pm Nuclear Criticality Safety Division-Program Committee
2:00 pm - 4:00 pm Reactor Physics-Program Committee
2:00 pm - 4:00 pm Education Training & Workforce Development Division-Executive Committee
2:00 pm - 4:00 pm Mathematics & Computation Division-Executive Committee
2:30 pm - 4:30 pm Thermal Hydraulics Division-Program Committee
3:00 pm - 3:30 pm Nuclear Nonproliferation Policy Division-Program Committee
3:00 pm - 4:00 pm Operations & Power Division-Program Committee
3:00 pm - 4:00 pm ANS-3.15, Cybersecurity
3:00 pm - 4:30 pm Nuclear Criticality Safety Division-Executive Committee
3:30 pm - 4:30 pm Decommissioning and Environmental Sciences Division-Program Committee
3:30 pm - 4:30 pm Nuclear Nonproliferation Policy Division-Executive Committee
4:00 pm - 5:30 pm Bylaws & Rules Committee
4:00 pm - 6:00 pm Reactor Physics Division-Executive Committee
4:00 pm - 6:00 pm NEDHO
4:00 pm - 6:00 pm Professional Engineering Exam Committee-Committee Meeting
4:30 pm - 5:30 pm Publications Steering Committee-Nuclear Technology Editorial Advisory
4:30 pm - 5:30 pm Decommissioning and Environmental Sciences Division-Executive Committee
4:30 pm - 5:30 pm Publications Steering Committee-FS&T Editorial Advisory Committee
4:30 pm - 5:30 pm Publications Steering Committee-NS&E Editorial Advisory Committee
4:30 pm - 6:00 pm Thermal Hydraulics Division-Executive Committee

Committee/Division/Other Meetings Daily

Monday, June 8

8:00 am – 9:00 am	ANS-19.3, Steady-State Neutronics Methods for Power Reactor Analysis
8:00 am – 10:00 am	ANS-8.1, Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors
8:00 am – 10:00 am	Nonreactor Nuclear Facilities Consensus Committee (NRNFCC)
9:00 am – 10:30 am	ANS-19, Reactor Physics Subcommittee
10:00 am – 11:00 am	ANS-8.22, Nuclear Criticality Safety Based on Limiting and Controlling Moderators
10:00 am – 12:00 pm	Fuel, Waste, and Decommissioning Consensus Committee (FWDCC)
10:00 am – 11:30 am	ANS-8.3, Criticality Accident Alarm System
10:30 am – 11:00 am	Young Member Group – Retention Committee
11:00 am - 12:00 pm	Young Member Group-Program Committee
11:00 am - 12:00 pm	NEED Committee
11:30 am – 1:00 pm	ANS-8.10, Criteria for Nuclear Criticality Safety Controls in Operations with Shielding and Confinement
11:30 am - 1:30 pm	Accelerator Applications Division-Executive Committee
12:00 pm - 1:00 pm	Scholarship Policy & Coordination Committee
12:30 pm - 1:30 pm	Young Member Group-Executive Committee
3:00 pm – 6:00 pm	Risk-informed, Performance-based Principles and Policy Committee (RP3C)
4:00 pm - 6:00 pm	ANS-8.7, Nuclear Criticality Safety in the Storage of Fissile Materials
4:00 pm - 6:00 pm	Honors & Awards Committee
4:30 pm - 6:30 pm	Publications Steering Committee
6:00 pm - 8:00 pm	Student Sections Committee- Executive Committee
7:00 pm - 9:00 pm	Christian Nuclear Fellowship

Tuesday, June 9

7:30 am – 8:30 am	ANS-8.17, Criticality Safety Criteria for the Handling, Storage, and Transportation of LWR Fuel Outside Reactors
8:30 am - 5:00 pm	Standards Board
10:00 am - 12:00 pm	Information Session on Nuclear Engineering PE Exam Module Program
11:30 am - 1:00 pm	National Program Committee-NPC National Meeting Subcommittee
1:00 pm - 5:00 pm	Finance Committee
2:00 pm - 3:00 pm	Public Policy Committee
3:00 pm – 5:00 pm	ANS-8.28, Administrative Practices for the Use of Non-Destructive Assay Measurements for Nuclear Criticality Safety
4:00 pm - 5:30 pm	Professional Divisions Committee
5:30 pm - 7:30 pm	National Program Committee - NPC Program

Wednesday, June 10

3:30 pm – 4:30 pm	Special Committee on Congressional Fellow
4:00 pm - 5:30 pm	Board of Directors Meeting
5:45 pm - 7:00 pm	ANS Annual Business Meeting

Thursday, June 11

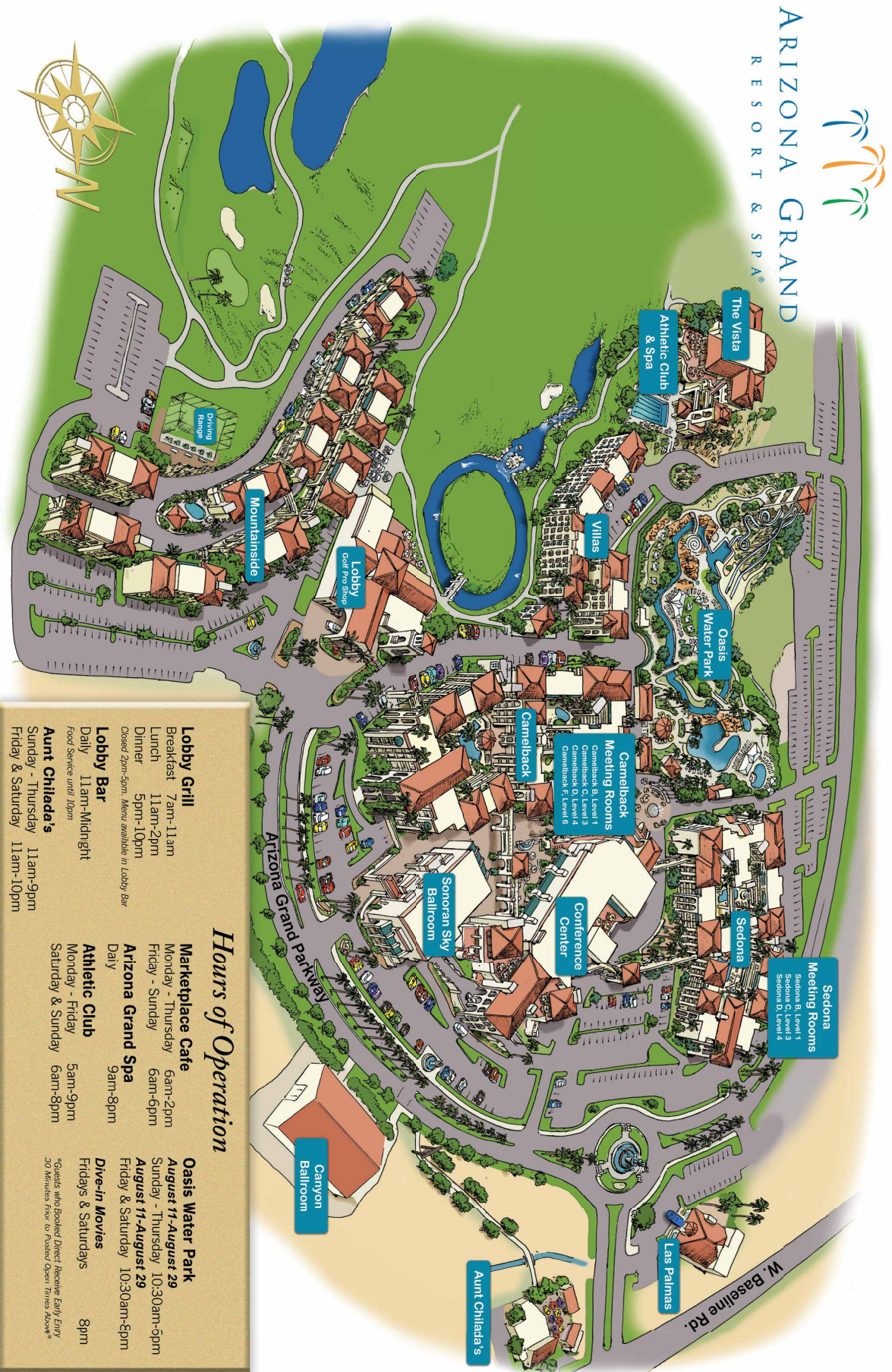
7:30 am - 4:30 pm	ANS Board of Directors Meeting
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Hotel Floorplan



Note: The following spaces are located on the second level of the Conference Center: Upper Lobby, South Mountain Ballroom, Sunset Patio, South Mountain Patio, Palm 2A, 2B, 2C, 2D, Palm Patio 2, Ocotillo A, Ocotillo B and Grand Veranda. The following spaces are located on the third level of the Conference Center: Palm 3A, 3B, 3C 3D and Palm 3 Patio.

Resort Map



Hours of Operation

Lobby Grill	Breakfast 7am-11am Lunch 11am-2pm Dinner 5pm-10pm Closed 2pm-5pm. Menu available in Lobby Bar	Marketplace Cafe	Monday - Thursday 6am-2pm Friday - Sunday 6am-6pm	Oasis Water Park	August 11-August 29 Sunday - Thursday 10:30am-6pm August 11-August 29 Friday & Saturday 10:30am-6pm
Lobby Bar	Daily 11am-Midnight Food Service until 10pm	Arizona Grand Spa	Daily 9am-8pm	Dive-in Movies	Friday & Saturday 8pm
Aunt Chila's	Sunday - Thursday 11am-9pm Friday & Saturday 11am-10pm	Athletic Club	Monday - Friday 5am-9pm Saturday & Sunday 6am-8pm	*Guests who Booked Direct Receive Early Entry 30 Minutes Prior to Pooled Open Times Above*	

See you at future



ANS Annual Meetings



2021 ANNUAL MEETING: JUNE 13-17

Omni / Convention Center, Providence, RI

2022 ANNUAL MEETING: JUNE 12-16

Hilton Anaheim, Anaheim, CA

2023 ANNUAL MEETING: JUNE 11-15

Marriott Indianapolis Downtown, Indianapolis, IN