19TH

INTERNATIONAL CONFERENCE ON

Environmental Degradation of Materials in Nuclear Power Systems – Water Reactors

ANS Meetings

TMS
The Minerals, Metals & Materials Society

NACE INTERNATIONAL

CANADIAN NUCLEAR SOCIETY
SOCIÉTÉ NUCLÉAIRE CANADIENNE

Official Program

August 18-22, 2019
Seaport Hotel and World Trade Center
Boston, MA

ANS Meetings

Our most sincere thanks to our sponsors for their support of the 19th International Conference on Environmental Degradation of Materials in Nuclear Power Systems - Water Reactors

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GENERAL MEETING INFORMATION

PLENARY, SPECIAL SESSIONS & EVENTS

TECHNICAL & POSTER SESSIONS

ADDITIONAL

Meeting Officials

19th International Conference on Environmental Degradation of Materials in Nuclear Power Systems–Water Reactors

GENERAL CHAIR
John H. Jackson
Idaho National Laboratory

PROGRAM CHAIR
Denise J. Paraventi
Naval Nuclear Laboratory

ASSISTANT TECHNICAL PROGRAM CHAIR
Stuart L. Medway
Wood Nuclear

Daily Schedule

Sunday, August 18

5:00-7:00 pm	Registration	Plaza Lobby
6:00-8:00 pm	Opening Reception	Lighthouse Ballroom

Monday, August 19

7:00 am-4:00 pm	Registration	Plaza Lobby
7:00 am-4:00 pm	Exhibits	Seaport Foyer
8:00-10:00 am	Opening Plenary: Regulatory Perspectives on Challenges Stemming from Modernization of Nuclear Energy	Plaza Ballroom
10:00-10:20 am	Morning Break **Sponsored by** Exelon Generation	Seaport Foyer
10:20-11:50 am	Technical Sessions	
	• Additive Manufacturing	Seaport A
	• Welds and Weld Metals—I	Seaport BC
	• BWR SCC and Water Chemistry—I	Flagship
12:00-1:20 pm	Lunch (on Own)	
1:20-3:25 pm	Technical Sessions	
	• Zirconium and Fuel Cladding—I	Seaport A
	• Weld and Weld Metals—II	Seaport BC
	• PWR Nickel SCC—Alloy 690—I	Seaport BC
	• BWR SCC and Water Chemistry—II	Flagship
3:25-3:45 pm	Afternoon Break **Sponsored by** Dominion Engineering, Inc.	Seaport Foyer
3:45-5:25 pm	Technical Sessions	
	• Zirconium and Fuel Cladding—II	Seaport A
	• PWR Ni Alloy SCC—Alloy 690—II	Seaport BC
	• Stainless Steel Aging and CASS	Flagship

Tuesday, August 20

7:00 am-10:30 am	Registration	Plaza Lobby
7:00-10:30 am	Exhibits	Seaport Foyer
8:20-10:00 am	Technical Sessions	
	• Accident Tolerant Fuel—I	Seaport A
	• PWR Nickel SCC—Initiation—I	Seaport BC
	• Plant Operating Experience—I	Flagship
10:00-10:20 am	Morning Break **Sponsored by** GE Research	Seaport Foyer
10:20-11:35 am	Technical Sessions	
	• Accident Tolerant Fuel—II	Seaport A
	• PWR Nickel SCC—Initiation—II	Seaport BC
	• Plant Operating Experience—II	Flagship

Daily Schedule

Wednesday, August 21

7:00 am-4:00 pm	Registration	Plaza Lobby
7:00 am-4:00 pm	Exhibits	Seaport Foyer
8:20-10:00 am	Technical Sessions	
	• Irradiation Damage—Stainless Steels—I	Seaport A
	• PWR Nickel Alloys—Mechanistic Understanding—I	Seaport BC
	• Concrete—I	Flagship
10:00-10:20 am	Morning Break **Sponsored by** Canadian Nuclear Laboratories / Laboratoires Nucléaires Canadiens	Seaport Foyer
10:20 am-12:00 pm	Technical Sessions	
	• Irradiation Damage—Stainless Steels—II	Seaport A
	• PWR Nickel SCC—Mechanistic Understanding—II	Seaport BC
	• Concrete—II	Flagship
12:00-1:20 pm	Lunch (on Own)	
1:20-3:25 pm	Technical Sessions	
	• Irradiation Damage—Nickel Alloys	Seaport A
	• PWR Oxides and Deposits—I	Seaport BC
	• Cables—I	Flagship
3:25-3:45 pm	Afternoon Break	Seaport Foyer
3:45-5:00 pm	Technical Sessions	
	• PWR Oxides and Deposits—II	Seaport BC
	• Cables—II	Flagship
5:30-7:00 pm	Poster Session	Plaza Ballroom C
7:00-9:00 pm	Banquet	Plaza Ballroom AB

Thursday, August 22

7:00 am-4:00 pm	Registration	Plaza Lobby
8:20-10:00 am	Technical Sessions	
	• Special Topics—I	Seaport A
	• PWR Stainless Steel Initiation	Seaport BC
	• Advances in Materials Computational Modeling—I	Flagship
10:00-10:20 am	Morning Break	Seaport Foyer
10:20 am-12:00 pm	Technical Sessions	
	• Special Topics—II	Seaport A
	• PWR Stainless Steel SCC and Fatigue Crack Growth—I	Seaport BC
	• Advances in Materials Computational Modeling—II	Flagship
12:00-1:20 pm	Lunch (on Own)	
1:20-3:25 pm	Technical Sessions	
	• PWR Secondary Side—I	Seaport A
	• PWR Stainless Steel SCC and Fatigue Crack Growth—II	Seaport BC
	• Irradiation Assisted SCC (IASCC) Testing—I	Flagship
3:25-3:45 pm	Afternoon Break	Seaport Foyer
3:45-5:25 pm	Technical Sessions	
	• PWR Secondary Side—II	Seaport A
	• Irradiation Assisted SCC (IASCC)—II	Flagship

General Information

MEETING INFORMATION

The 19th International Conference on Environmental Degradation of Materials in Nuclear Power Systems-Water Reactor meeting is to foster an exchange of ideas about such problems and their remedies in water—cooled nuclear power plants of today and of the future. This meeting covers material problems facing nickel base alloys, stainless steels, pressure vessel and piping steels, zirconium alloys, and other alloys in water environments of relevance. Components covered include pressure boundary components, reactor vessels and internals, steam generators, fuel cladding, irradiated components, fuel storage containers, and balance of plant components and systems.

REGISTRATION

Location: Plaza Lobby

Sunday, August 18	5:00 pm – 7:00 pm
Monday, August 19	7:00 am – 4:00 pm
Tuesday, August 20	7:00 am – 10:30 am
Wednesday, August 21	7:00 am – 4:00 pm
Thursday, August 22	7:00 am – 4:00 pm

EXPO HOURS & LOCATION

Join us and visit with our exhibitors in the Technology Expo! Learn about new technology, products and services that are being offered.

Location: Seaport Foyer

Monday, August 19	7:00 am – 4:00 pm
Tuesday, August 20	7:00 am – 10:30 am
Wednesday, August 21	7:00 am – 4:00 pm

EXHIBITORS

Gateway for Accelerated Innovation in Nuclear

Nuclear Science User Facilities

Light Reactor Sustainability (LWRS) Program

ATTENDEE MEAL FUNCTIONS

Breaks will be provided to all registered meeting attendees, Monday-Thursday in the Seaport Foyer.

Opening Reception: This reception is a ticketed event. Heavy hors d'oeuvre and beverage tickets are included with a full meeting registration. Additional tickets are available for purchase.

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 designated contact for reports at the 19th International Conference on Environmental Degradation of Materials in Nuclear Power Systems–Water Reactors is ANS Executive Director Bob Fine. He can be reached during regular business hours at 708-579-8200. At other times, he can be reached at 708-476-7096. He can also be reached by email at rfine@ans.org.

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

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 & Events

SUNDAY, AUGUST 18

Opening Reception
Location: Lighthouse Ballroom **Time:** 6:00-8:00 pm

One ticket to the Opening Reception is included in the full meeting registration fee. Additional tickets can be purchased at the ANS Registration desk.

MONDAY, AUGUST 19

Opening Plenary: Regulatory Perspectives on Challenges Stemming from Modernization of Nuclear Energy
Location: Plaza Ballroom **Time:** 8:00-10:00 am

"Advanced Nuclear" has experienced a recent surge of interest. This includes but is not limited to advances in modularization, alternative reactor designs, and engineered materials and systems. With the recent increase in interest, a renewed emphasis on a holistic approach to implementation of technological advances is merited. It is critical that modern practitioners of materials research have a broad perspective on not only innovative advances themselves, but also how implementation of these advances can affect licensing and regulation. A three-person, moderated panel consisting of high-level representatives from the United States, the United Kingdom, and Canada will discuss the unique regulatory challenges that arise from advancements in technologies, including advanced materials and processing techniques, that are integral to nuclear reactor primary and secondary systems.

Moderator: Rita Baranwal *(U.S. DOE)*

Speakers: Raj Iyengar *(U.S. NRC)*
Mark Foy (*U.K. Office of Nuclear Regulation)*
Ramzi Jammal *(Canadian Nuclear Safety Commission)*

WEDNESDAY, AUGUST 21

Poster Session
Location: Plaza Ballroom C **Time:** 5:30-7:00 pm

Banquet
Location: Plaza Ballroom AB **Time:** 7:00-9:00 pm

Additive Manufacturing

Cochairs: Myles Connor *(GE Hitachi Nuclear Energy)*, David Anthony Horner *(Rolls-Royce)*
Location: Seaport A **Time:** 10:20-11:35 am

10:20 am: Experimental Design to Study the Mechanical Performance of Irradiated Acrylonitrile Butadiene Styrene Fabricated via Fused Filament Fabrication, Arielle J. Miller, Grant Warner, Dharmaraj Raghavan *(Howard Univ)*

10:45 am: Irradiation Damage and IASCC of Printed 316L for Use as Fuel Cladding, M. McMurtrey, R. O'Brien, C. Sun, C. Shiau, F. Teng *(INL)*

11:10 am: Oxide Dispersion Type 304L Stainlees Steel by Additive Manufacturing Process, Takahiro Ishizaki, Kinya Aota, Yingjuan Yang, Yusaku Maruno, Atsuhiko Onuma *(Hitachi)*

Welds and Weld Metals—I

Cochairs: Catherine Guerre *(CEA)*, Pal Efsing *(GE Global Research Center)*, Bogdan Alexandreanu *(ANL)*
Location: Seaport BC **Time:** 10:20 am-11:35 am

10:20 am: Effect of Follow-Up Post Weld Heat Treatment on Microstructure and PWSCC of Alloy 52M Weld Metal in Dissimilar Metal Weld Joint, Jiarong Ma, Kun Zhang, Tongming Cui, Qi Xiong, Zhanpeng Lu, Junjie Chen *(Shanghai Univ)*, Chendong Yang, Maolong Zhang, Weibao Tang *(Shanghai Electric Nuclear Power Group)*

10:45 am: Characterization of Alloy 52M Weld Metal Near the Fusion Boundary and Oxide Films Formed in Simulated PWR Primary Water, Kun Zhang, Jiarong Ma, Tongming Cui, Zhanpeng Lu, Fei Ning, Yibo Jia, Xue Liang *(Shanghai Univ)*

11:10 am: Effect of Welding Dilution and Dendrite Orientation on SCC Behavior of Alloy 52M Welding Metal in Simulated PWR Primary Water, Jiarong Ma, Kun Zhang, Tongming Cui, Zhanpeng Lu, Xue Liang, Wenqing Liu *(Shanghai Univ)*, Zhiming Zhong, Guangdong Han *(State Nuclear Power Plant Service Co.)*

BWR SCC and Water Chemistry—I

Cochairs: Robert E. Carter *(EPRI)*, Michelle Mura *(EPRI)*, Hans Peter Seifert *(PSI)*
Location: Flagship **Time:** 10:20 am-12:00 pm

10:20 am: SCC of Alloy 82 Weld Metal, Peter L. Andresen *(Andresen Consulting)*

10:45 am: Influence of Long-Term Thermal Aging on SCC Initiation Susceptibility of L-Grade Aaustenitic Stainless Steel, K. Kondo, S. Aoki, Y. Fujimura, T. Hirade, Y. Kaji, S. Yamashita *(JAEA)*

11:10 am: Effect of Specimen Size and Percent Engagement on SCC Behavior of Alloy 82 in BWR Environments, Katsuhiko Kumagai, Hiroyuki Nakano, Takayuki Kaminaga *(TEPCO)*

11:35 am: Formulation of the Irradiation Assisted Stress Corrosion Crack Growth Rates for Neutron-Irradiated Stainless Steels in High-Temperature Water of a Boiling Water Reactor, Masato Koshiishi *(Nippon Nuclear Fuel Development Co., Ltd.)*, Kazuhiro Chatani, Shigeaki Tanaka *(Toshiba Energy Systems & Solutions Corp.)*, Hiroyuki Nakano, Takayuki Kaminaga *(TEPCO)*

Technical Sessions: Monday August 19

MONDAY, AUGUST 19
TECHNICAL SESSIONS - 1:20 PM

Zirconium and Fuel Cladding—I
Cochairs: Jaqueline Stevens *(Framatome)*, Raul Rebak *(GE Global Research Center)*, Cem Topbasi *(EPRI)*
Location: Seaport A **Time:** 1:20-3:25 pm

1:20 pm: Effect of Cold Work on Hydrogen Diffusion in Zr-2.5%Nb Alloys at Reactor Temperatures, Heidi Nordin, Jaganathan Ulaganathan, Sean Hanlon, Dylan Broad *(CNL)*

1:45 pm: Effect of UV Irradiation on Corrosion Behavior of Zirconium Alloy in High Temperature Water Conditions, Taeho Kim, Yalong He, Zefeng Yu, Mohamed S. Elbakhshwan, Li He, Adrien Couet *(Univ of Wisconsin, Madison)*

2:10 pm: Porosity and Chemistry Change of CRUD with Different Heat Flux Conditions, Yunju Lee, Seung Chang Yoo, Junhyuk Ham *(UNIST)*, Ho Cheol Shin *(KHNP)*, Byung Gi Park *(Soonchunhyang Univ)*, Ji Hyun Kim *(UNIST)*

2:35 pm: Development and Validation of a New Experimental Device for Studies of Iodine Stress Corrosion Cracking of Zirconium Alloys, Kamila Wilczynska *(CEA/INSA de Lyon)*, Matthew Bono, David Le Boulch *(CEA)*, Marion Fregonese *(INSA de Lyon)*, Valérie Chabretou *(Framatome)*, Nathanael Mozzani, Laureline Barbie *(EDF)*

3:00 pm: Evaluating the Effect of Hydride Embrittlement and Pulse Width on Zircaloy Cladding Transient Performance., D. Kamerman, D. Swank, D. Haggard, A. Matthews, L. Emerson, D. Wachs *(INL)*

Weld and Weld Metals—II
Cochairs: Catherine Guerre *(CEA)*, Pal Efsing *(GE Global Research Center)*, Bogdan Alexandreanu *(ANL)*
Location: Seaport BC **Time:** 1:20-2:10 pm

1:20 pm: Low Temperature Crack Propagation Mechanism of Alloy 182 Weld, Young Suk Kim, Sung Soo Kim *(KAERI)*

1:45 pm: SCC Behavior at Alloy 52M-182 Weld Overlay Interfaces in a PWR Environment, Bogdan Alexandreanu, Yiren Chen *(ANL)*

PWR Nickel SCC—Alloy 690—I
Cochairs: Tyler Moss *(NNL)*, Toshio Yonezawa *(Tohoku Univ)*, Daniel Schreiber *(PNNL)*
Location: Seaport BC **Time:** 2:10-3:00 pm

2:10 pm: Morphology of Cavities Formed on Grain Boundary of Cracked Alloy TT690, Takumi Terachi, Makie Okamoto, Takuyo Yamada, Koji Arioka *(INSS)*

2:35 pm: Effect of Thermal Aging on Microstructure and Hardness of Industrial Heats of Alloy 690, Caitlin Huotilainen, Ulla Ehrnstén, Matias Ahonen *(VTT Technical Research Centre of Finland Ltd)*, Hannu Hänninen *(Aalto Univ)*

BWR SCC and Water Chemistry—II
Cochairs: Robert E. Carter *(EPRI)*, Michelle Mura *(EPRI)*, Hans Peter Seifert *(PSI)*
Location: Flagship **Time:** 1:20-3:25 pm

1:20 pm: Characteristics of Work Hardened Surface Layer on Austenitic Stainless Steels and Its Relation to SCC Susceptibility in High Temperature Water, Hiroshi Abe, Yutaka Watanabe, Takamichi Miyazaki *(Tohoku Univ)*

1:45 pm: Next Generation of Noble Metal Application for Boiling Water Reactors, Joe Giannelli, Erica Libra-Sharkey, Collin Custer, George Inch *(Nine Mile Point Nuclear Station)*, Andrew Odell *(Exelon Corp.)*, Michelle Mura *(EPRI), Mike Ford (Structural Integrity Assoc)*

2:10 pm: Assessment of the SCC Mitigation Capabilities of the Noble Metal Chemical Application Technology in a Simulated BWR Environment, Pascal V. Grundler, Stefan Ritter, Sriharitha Rowthu, Hans-Peter Seifert *(PSI)*

2:35 pm: Impact of Corrosion of Nickel Based Coatings for Flow Accelerated Corrosion Control on BWR Radiation Fields, Alfred J. Jarvis, Joseph F. Giannelli, Barry Gordon, David Segletes *(Structural Integrity Associates)*

3:00 pm: Revealing How Alkali Cations Affect the Electrical Double Layer Structure of Stainless Steel in Alkaline Aqueous Environments, Rachel Guia P. Giron, Xin Chen, Erika Callagon La Plante *(UCLA)*, Maxim N. Gussev, Keith J. Leonard *(ORNL)*, Gaurav N. Sant *(UCLA)*

MONDAY, AUGUST 19
TECHNICAL SESSIONS - 3:45 PM

Zirconium and Fuel Cladding—II
Cochairs: Jaqueline Stevens *(Framatome)*, Raul Rebak *(GE Global Research Center)*, Cem Topbasi *(EPRI)*
Location: Seaport A **Time:** 3:45-5:25 pm

3:45 pm: Concurrent Effect of Irradiation and Hydrogeneration on Microstructural and Mechanical Properties of Zr Based Fuel Cladding Alloys, Sho Kano, Huilong Yang, John McGrady *(Univ of Tokyo)*, Toru Higuchi, Yoshinori Etoh *(Nippon Nuclear Fuel Development Co., Ltd.)*, Hiroaki Abe *(Univ of Tokyo)*

4:10 pm: Characterizing Fatigue Damage in Zr-2.5Nb, H. M. Nordin, M. Mattucci, A. Phillion *(CNL)*, T. M. Karlsen *(Inst for Energy Technology)*

4:35 pm: Development of a Gaseous Iodine Testing System to Determine the I-SCC Properties of Zirconium Alloys, Sean M. Hanlon *(CNL/Queen's Univ)*, Andrew Phillion *(CNL)*, Conor Gillen *(Univ of Manchester)*, Mark R. Daymond *(Queen's Univ)*

5:00 pm: Biaxial Creep of Textured Zr-Nb Alloys, Micah Tillman, Pratik Joshi *(NCSU)*, Nilesh Kumar *(Univ of Alabama)*, Mahmut N. Cinbiz *(ORNL)*, Kurokonda Murty *(NCSU)*

PWR Ni Alloy SCC—Alloy 690—II
Cochairs: Tyler Moss *(NNL)*, Toshio Yonezawa *(Tohoku Univ)*, Daniel Schreiber *(PNNL)*
Location: Seaport BC **Time:** 3:45-5:25 pm

3:45 pm: The Mechanistic Understanding on the Stress Corrosion Cracking Growth Rate in Simulated PWR Primary Water for Cold Worked TT Alloy 690, Toshio Yonezawa, Masashi Watanabe *(Tohoku Univ)*, Atsushi Hashimoto *(Kobe Material Testing Laboratory Co. Ltd.)*

4:10 pm: Technical Basis for ASME Section XI Code Case for Stress Corrosion Crack Growth Rate Equations for Alloy 690 and Associated Welds, Warren Bamford *(Bamford Consulting Services)*, Amanda Jenks *(Dominion Eng)*, Ron Janowiak *(Exelon Corp.)*, Gary Stevens *(EPRI)*

4:35 pm: Tests on Mockups Representative of Rolling Zones of Steam Generator Tubes in High Temperature Hydrogenated Water, Daniel Brimbal *(Framatome SAS)*, Steve Fyfitch *(Framatome Inc)*, Olivier Calonne, Nicolas Huin *(Framatome SAS)*

5:00 pm: Examination of Cavity Formation in Cold-Worked Alloy 690, Matthew Olszta, Ziqing Zhai, Mychailo Toloczko, Stephen Breummer *(PNNL)*

Stainless Steel Aging and CASS
Cochairs: Hannu Hanninen *(Aalto Univ)*, Thak Sang Byun *(PNNL)*, Yiren Chen *(ANL)*
Location: Flagship **Time:** 3:45-5:00 pm

3:45 pm: Non-Destructively Detecting LWR Structural Material Embrittlement Using Transient Grating Spectroscopy, Saleem A. Aldajani, Benjamin R. Dacus, Cody A. Dennett *(MIT)*, M. Grace Burke, Kudzanai Mukahiwa *(Manchester Univ)*, James J. Wall *(EPRI)*, Thak Sang Byun *(PNNL)*, Michael P. Short *(MIT)*

4:10 pm: Fracture Property Degradation in Cast Stainless Steels after Long-Term Thermal Aging, T. S. Byun, T. G. Lach, D. A. Collins *(PNNL)*, C. Jang *(KAIST)*

4:35 pm: Environmentally Assisted Cracking and Fracture Toughness of an Irradiated Stainless Steel Weld, Y. Chen, B. Alexandreanu *(ANL)*, C. Xu, Y. Yang *(Univ of Florida)*, K. Natesan *(ANL)*, A. S. Rao *(NRC)*

Technical Sessions: Tuesday August 20

TUESDAY, AUGUST 20
TECHNICAL SESSIONS - 8:20 AM

Accident Tolerant Fuel—I
Cochairs: Gary S. Was *(Univ of Michigan)*, Bruce A. Pint *(ORNL)*, J. Rory Kennedy *(INL)*
Location: Seaport A **Time:** 8:20-10:00 am

8:20 am: Steam Oxidation, Burst and Critical Heat Flux Testing of Commercial FeCrAl Cladding, B. A. Pint, L. A. Baldesberger, K. A. Kane *(ORNL)*

8:45 am: Corrosion Behaviour of Physical Vapour Deposited Coatings on Nuclear Components and Fe-Cr-Al Alloy Under Normal Operation and Accident Scenarios, Caitlin Dever, Mitchell Mattucci *(CNL)*, Kevin Daub, Suraj Persaud *(Queen's Univ)*, Raul B. Rebak *(GE Global Research)*, Brian Langelier *(McMaster Univ)*, Heidi Nordin *(CNL)*

9:10 am: Environmental Degradation Resistance of ATF FeCrAl Cladding Tube Specimens During the Fuel Cycle, Michael Schuster, Evan J. Dolley, Timothy B. Jurewicz,Raul B. Rebak *(GE Research)*

9:35 am: Assessment of Deformation Mechanisms in Neutron-Irradiated Accident-Tolerant FeCrAl Alloys via in Situ Mechanical Testing and TEM Analysis, M. N. Gussev, D. Zhang, K. G. Field *(ORNL)*

PWR Nickel SCC—Initiation—I
Cochairs: Mychailo Toloczko *(PNNL)*, Cecilie Duhamel *(MINAES ParisTech)*, Stuart Medway *(Wood Nuclear)*
Location: Seaport BC **Time:** 8:20-10:00 am

8:20 am: Mitigation of Primary Water Stress Corrosion Cracking Initiation of Alloy 600, Sonya Pemberton, Jack Beswick, Mark Chatterton, Jill Meadows, Stuart Medway *(Woods Nuclear)*

8:45 am: SCC Initiation of Alloy 82 in Nominal PWR Primary Water at 360°C, Catherine Guerre, Brice Bourdiliau *(CEA)*, Emilien Burger, Thierry Couvant *(EdF)*

9:10 am: SCC Initiation and Growth in PWR Primary Water Containing KOH vs. LiOH, Peter Andresen (Andresen Consulting), Peter Chou *(EPRI)*

9:35 am: Crack Initiation Behavior of Cold-Worked Alloy 690 in Simulated PWR Primary Water - Role of Starting Microstructure, Applied Stress and Cold Work on Precursor Damage Evolution, Ziqing Zhai, Matthew Olszta, Mychailo Toloczko, Stephen Bruemmer *(PNNL)*

Plant Operating Experience—I
Cochairs: Ulla Ehrnsten *(VTT Technical Research Center)*, Meg Audrain *(NRC)*
Location: Flagship **Time:** 8:20-10:00 am

8:20 am: Examination of Cracks in Pressure Sensing Lines of the Feed Water System and the Strategy of NPP Goesgen for Replacement, Thomas Wermelinger *(NPP Goesgen)*, Michael Schinhammer *(Qualitech AG)*

8:45 am: Characterization of In Service Thermal Aging Effects in Base Metals and Welds of the Pressure Vessel of a Decommissioned PWR Pressurizer, after 27 years of operation, Pierre Joly, Lingtao Sun *(Framatome)*, PåoEfsing *(Vattenfall/Ringhals AB)*, Jean-Paul Massoud *(EDF)*, Frédéric Somville, Robert Gerard *(Electrabel)*, Ying Hui An *(CGNPC)*, Jonathan Bailey *(EDF)*

9:10 am: Stress Corrosion Cracking of A286 Reactor Coolant Pump Turning Vane Bolts, Michael R. Ickes *(Westinghouse)*, Andrew M. Ruminski *(NobelClad)*

9:35 am: Stress Corrosion Cracking of an Austenitic Stainless Steel Pipe Weld, Michael R. Ickes *(Westinghouse)*

TUESDAY, AUGUST 20
TECHNICAL SESSIONS - 10:20 AM

Accident Tolerant Fuel—II
Cochairs: Gary S. Was *(Univ of Michigan)*, Bruce A. Pint *(ORNL)*, J. Rory Kennedy *(INL)*
Location: Seaport A **Time:** 10:20-11:35 am

10:20 am: Evaluation of the Corrosion Kinetics of SiC with and Without Mitigation Coatings in LWR Chemistries, Peter Doyle *(Univ of Tennessee, Knoxville)*, Stephen Raiman *(ORNL)*, Caen Ang *(Univ of Tennessee, Knoxville)*, Yutai Kato *(ORNL)*, Steven J. Zinkle *(Univ of Tennessee, Knoxville/ORNL)*

10:45 am: Irradiation-Induced Cracking of Dual-Purpose Coatings on SiC, Stephen S. Raiman *(ORNL)*, Peter J. Doyle, Caen Ang *(ORNL/Univ of Tennessee)*, Takaaki Koyanagi *(ORNL)*, David M. Carpenter *(MIT)*, Kurt A. Terrani, Yutai Katoh *(ORNL)*

11:10 am: Corrosion of Fe-12Cr-2Si Alloy in High Temperature Steam Environments, Amanda Leong, Jinsuo Zhang, Yi Xie *(Virginia Tech)*

PWR Nickel SCC—Initiation—II
Cochairs: Mychailo Toloczko *(PNNL)*, Cecilie Duhamel *(MINAES ParisTech)*, Stuart Medway *(Wood Nuclear)*
Location: Seaport BC **Time:** 10:20-11:35 am

10:20 am: An Investigation into the Corrosion Behaviors of Stainless Steel and Ni-Based Alloy in Simulated PWR Primary Water Environments, Che Jung Chang, Mei Ya Wang, Tsung Kuang Yeh *(Natl Tsing Hua Univ)*

10:45 am: Effect of Local Strain and GND Density on Crack Initiation in Alloy 600., Naganand Saravanan, Phani S. Karamched *(Univ of Oxford)*, Morgane Le Faucheur, Emilien Burger *(EDF R&D)*, Fabio Scenini *(Univ of Manchester)*, Sergio Lozano-Perez *(Univ of Oxford)*

11:10 am: Development of Residual Stress Driven Stress Corrosion Crack Initiation and Growth Specimens, Tyler Moss, John Brockenbrough *(NNL)*

Plant Operating Experience—II
Cochairs: Ulla Ehrnsten *(VTT Technical Research Center)*, Meg Audrain *(NRC)*
Location: Flagship **Time:** 10:20-11:35 am

10:20 am: Corrosion Issues in Future Years: A TSO Overview, Ian de Curieres *(IRSN)*

10:45 am: Operational Experience of Siemens/KWU LWR Nuclear Power Plants, Renate Kilian, Armin Roth *(Framatome Gmbh)*, Marin Widera *(RWE Power AG)*

11:10 am: Design and Fabrication of Alloy A-286 for Resistance to IGSCC in PWRs, Stephen Fyfitch, Sarah Davidsaver *(Framatome, Inc.)*, Kyle Amberge *(EPRI)*

Technical Sessions: Wednesday August 21

WEDNESDAY, AUGUST 21
TECHNICAL SESSIONS - 8:20 AM

Irradiation Damage—Stainless Steels—I
Cochairs: Jeremy Busby *(ORNL)*, Peter Chou *(EPRI)*, Cheng Sun *(INL)*
Location: Seaport A **Time:** 8:20-10:00 am

8:20 am: Development of Prediction Method for Radiation Hardenening of Reactor Internals, Hitoshi Seto, Yuji Kitsunai *(Nippon Nuclear Fuel Development Co., LTD)*, Shigeaki Tanaka *(Toshiba Energy Systems & Solutions Corp.)*, Ryoji Obata *(GE-Hitachi Nuclear)*

8:45 am: Microstructural Characterization of Proton Irradiated 304L SS at 100°C and 360°C, Colin D. Judge *(CNL)*, B. Langelier *(McMaster Univ)*, M. A. Mattucci *(CNL)*, Q. Wang, M. Daymond *(Queen's Univ)*, G. S. Was *(Univ of Michigan)*, J. Smith *(CNL)*

9:10 am: Empirical Equations for Tensile Properties and Stress-Strain Curves of Neutron Irradiated Stainless Steels in LWR Conditions, Koji Fukuya, Katsuhiko Fujii *(Inst of Nuclear Safety System)*, Yasuhiro Chimi, Kuniki Hata *(JAEA)*

9:35 am: Post-Irradiation Examination of High Fluence Baffle-Former Bolts Retrieved from a Westinghouse Two-Loop Downflow Type PWR, Xiang Chen *(ORNL)*, Tianyi Chen *(Oregon State Univ)*, Chad M. Parish, Mikhail A. Sokolov, Keith J. Leonard *(ORNL)*

PWR Nickel Alloys—Mechanistic Understanding—I
Cochairs: Steve Bruemmer *(PNNL)*, Samaneh Nouraei *(Office for Nuclear Regulation)*, Sonya Pemberton *(Wood Nuclear)*
Location: Seaport BC **Time:** 8:20-10:00 am

8:20 am: Effect of Material Condition on Stress Corrosion Crack Initiation of Cold-Worked Alloy 600 in Simulated PWR Primary Water, Ziqing Zhai, Mychailo Toloczko, Stephen M. Bruemmer *(PNNL)*

8:45 am: The Effect of Diffusion-Induced Grain Boundary Migration Ahead of SCC Crack Tips on Propagation, Zhao Shen *(Univ of Oxford)*, Koji Arioka *(Inst of Nuclear Safety Systems)*, Sergio Lozano-Perez *(Univ of Oxford)*

9:10 am: Understanding the Role of Grain Boundary Migration on the Initiation Stages of PWSCC, L. Volpe, M. G. Burke, F. Scenini *(Univ of Manchester)*

9:35 am: Comparison of Selective Oxidation in Ni-Based Alloys Exposed to PWR Primary Water and Rhines Pack Environments, Karen Kruska, Daniel K. Schreiber, Matthew J. Olszta, Brian J. Riley, Stephen M. Bruemmer *(PNNL)*

Concrete—I
Cochairs: Thomas Rosseel *(ORNL)*, Elena Tajuelo Rodrigues *(ORNL)*, Zachary Grasley *(Texas A&M)*
Location: Flagship **Time:** 8:20-10:00 am

8:20 am: Distinct Effects of Irradiation on the Structure and Chemical Reactivity of Silicates and Carbonates, Erika Callagon La Plante, Yi-Hsuan Hsiao *(UCLA)*, Isabella Pignatelli *(Université de Lorraine)*, Aditya Kumar *(Missouri Univ Sci Technol)*, N.M. Anoop Krishnan *(India Inst of Technology)*, Tandre Oey *(UCLA)*, Howard Dobbs *(Univ of California, Santa Barbara)*, Yingtian Yu (UCLA), Bu Wang *(Univ of Wisconsin, Madison)*, Narayanan Neithalath *(Arizona State Univ)*, Kevin G. Field *(ORNL)*, Jacob Israelachvili *(Univ of California, Santa Barbara)*, Yann Le Pape *(ORNL)*, Mathieu Bauchy, Gaurav Sant *(UCLA)*

8:45 am: Review of Radiation Induced Degradation of Concrete Structure in Commercial Nuclear Power Plants Around Reactor Vessel, Bruce Biwer, David Ma *(ANL)*, Yunping Xi, Yuxiang Jing *(Univ of Colorado at Boulder)*, Madhumita Sircar, Jinsuo Nie *(NRC)*

9:10 am: Effect of Gamma Irradiation on Creep Properties of Cement Paste Analogues, Elena Tajuelo Rodriguez, Yann Le Pape, Thomas M. Rosseel *(ORNL)*, William Hunnicutt *(Columbia Univ)*

9:35 am: Nuclear Concrete Microstructure Generation for Simulating Creep, Christa E. Torrence, Aishwarya Baranikumar, Zachary Grasley *(Texas A&M)*

WEDNESDAY, AUGUST 21
TECHNICAL SESSIONS - 10:20 AM

Irradiation Damage—Stainless Steels—II
Cochairs: Jeremy Busby *(ORNL)*, Peter Chou *(EPRI)*, Cheng Sun *(INL)*
Location: Seaport A **Time:** 10:20-10:45 am

10:20 am: Radiation-Induced Ferrite Formation as a Potential Issue in PWR Austenitic Internals, D. A. Merezhko, M. S. Merezhko *(Institute of Nuclear Physics)*, O. P. Maksimkin *(Inst of Nuclear Physics/Moscow Eng Physics Inst)*, M. N. Gussev *(ORNL)*, F. A. Garner *(Radiation Effects Consulting LLC/Moscow Eng Physics Inst)*

PWR Nickel SCC—Mechanistic Understanding—II
Cochairs: Steve Bruemmer *(PNNL)*, Samaneh Nouraei *(Office for Nuclear Regulation)*, Sonya Pemberton *(Wood Nuclear)*
Location: Seaport BC **Time:** 10:20 am-12:00 pm

10:20 am: Investigating the Role of Hydrogen on Stress Corrosion Cracking by Micromechanical Testing, Edward Roberts, Edmund Tarleton *(Univ of Oxford)*, Florence Carrette *(EDF R&D)*, Sergio Lozano-Perez, *(Univ of Oxford)*

10:45 am: In Situ Microtensile Testing of Oxidized grain Boundaries in Alloy 600, E Still, H. Vo, K. Lam, J. Kabel, R. Auguste *(Univ of California, Berkeley)*, P. Chou *(EPRI)*, P. Hosemann *(Univ of California, Berkeley)*

11:10 am: Transgranular Stress Corrosion Cracking Mechanism of Alloy 690 in Simulated Primary Water, H. P. Kim, S. W. Kim, S. H. Lim, J. Y. Lee, S. H. Cho, M. J. Choi, S. S. Hwang, Y. S. Lim, D. J. Kim *(KAERI)*

11:35 am: Effect of Isothermal Aging on Long Range Ordering in Ni-Cr Based Commercial Alloys, Nicholas Aerne, Fei Teng, Julie D. Tucker *(Oregon State Univ)*

Concrete—II
Cochairs: Thomas Rosseel *(ORNL)*, Elena Tajuelo Rodrigues *(ORNL)*, Zachary Grasley *(Texas A&M)*
Location: Flagship **Time:** 10:20 am-12:00 pm

10:20 am: 3D Creep Response of Nuclear Concrete, Aishwarya Baranikumar, Christa E. Torrence, Zachary Grasley *(Texas A&M)*

10:45 am: Nondestructive Evaluation of Concrete Specimens Representative of Nuclear Power Plants Containing Known Defects, N. Dianne B. Ezell, Austin Albright *(ORNL)*, Dan Floyd *(Univ of Tennessee, Knoxville)*, Lev Khazanovich *(Univ of Pittsburgh)*

11:10 am: Overview of Electric Power Research Institute's Research on Irradiation of Concrete, Emma L. Wong, James J. Wall *(EPRI)*

11:35 am: Alkali-Activated Concretes for Use in Nuclear Facilities and High Temperature Environments, Casey Sundberg *(Univ of Minnesota, Duluth)*

Technical Sessions: Wednesday August 21

WEDNESDAY, AUGUST 21
TECHNICAL SESSIONS - 1:20 PM

Irradiation Damage—Nickel Alloys
Cochairs: Lawrence Nelson *(JLN Consulting)*, Simon Pimblott *(INL)*, Anna Hojna *(Centrum Vyzkumu Rez)*
Location: Seaport A **Time:** 1:20-3:25 pm

1:20 pm: Microstructure of Ni and X-750 Irradiated at Low and High Temperatures, W. Li, C. Judge, L. Walters *(CNL)*

1:45 pm: On the Potential Synergies of Helium and Hydrogen on the Nucleation and Stability of Cavity Clusters in Inconel X-750 Irradiated in a High Thermal Neutron Flux Spectra, C. Judge, H. Rajakumar *(CNL)*, A. Korinek *(McMaster Univ)*, Grant Bickel *(CNL)*

2:10 pm: Modeling the Evolution of Intragranular Helium Bubbles in Nickel Using the Included Phase Model, Andrew A. Prudil, Michael J. Welland, Colin D. Judge *(CNL)*

2:35 pm: Using a Multi-Scale Approach to Assess the Mechanical Properties and Deformation Mechanisms of High Dose Inconel X-750, C. Howard, C. D. Judge, V. Bhakhri *(CNL)*, Q. Wang, M. R. Daymond *(Queen's Univ)*, D. Murray, F. Teng *(INL)*, T. Skippon, M. Mattucci, H. Rajakumar, C. Mayhew, C. Dixon, D. Poff, G. A. Bickel *(CNL)*

3:00 pm: Small Scale Tensile Testing of Grain Boundary Strength of X-750 Alloy, Lingfeng He, Daniel Murray, Xiang Liu, Wen Jiang, Mukesh Bachhav *(INL)*, Xianming Bai *(Virginia Tech)*, Sebastien Teysseyre *(INL)*

PWR Oxides and Deposits—I
Cochairs: Sergio Lozano Perez *(Univ of Oxford)*, Bryan Miller *(NNL)*, Jared Smith *(CNL)*
Location: Seaport BC **Time:** 1:20-3:25 pm

1:20 pm: Oxidation Characteristics of Ni-Cr-Fe Alloy Systems in Simulated PWR Primary Water : Effect of Cr Content, Hee-Sang Shim, Do Haeng Hur *(KAERI)*

1:45 pm: Effect of Proton-Induced Radiolysis on Corrosion of 316L Stainless Steel in Simulated PWR Primary Water, Rigel D. Hanbury, Gary S. Was *(Univ of Michigan)*

2:10 pm: Understanding the Mechanisms of Surface and Crack Tip Oxidation with Valence Mapping, Sergio Lozano-Perez, Zhao Shen (Univ of Oxford), Donghai Du (Shanghai Jiao Tong Univ/Univ of Michigan), Lefu Zhang *(Shanghai Jiao Tong Univ)*

2:35 pm: Local Oxidation Penetration of Hydrogen-Charged 308L Stainless Steel Cladding in Deaerated PWR Primary Water, Tongming Cui, Fei Ning, Jiarong Ma, Zhanpeng Lu, Kun Zhang, Yibo Jia, Xue Liang *(Shanghai Univ)*, Xiangkun Ru *(Shanghai Univ/Shanghai Electric Nuclear Power Group)*, Tetsuo Shoji *(Tohoku Univ)*

3:00 pm: The Influence of Metal Substrate on CRUD Build-Up Under Simulated PWR Conditions, Stefano Cassineri, Jonathan Duff, Michele Curioni *(Univ of Manchester)*, Andrew Banks *(Rolls-Royce plc)*, Fabio Scenini *(Univ of Manchester)*

Cables—I
Cochairs: Leo S. Fifield *(PNNL)*, Raihan Khondker *(STP Nuclear Operating Co.)*, Robert Duckworth *(ORNL)*
Location: Flagship **Time:** 1:20-3:25 pm

1:20 pm: Overview of the Electric Power Research Institute's Cables and Concrete Aging Management Research, Andrew Mantey, James Wall, Emma Wong *(EPRI)*, invited

1:45 pm: Combined Approach to Medium Voltage Cable and Accessories Aging Management Technique at Nuclear Power Plants, Raihan Khondker *(STPNOC)*, Sarajit Banerjee, David Rouison, Rick Easterling *(Kinectrics)*

2:10 pm: Cable Aging and CM Approaches Beyond the Shortcomings of IAEA Nuclear Energy Series No. NP-T-3.6, Kenneth T. Gillen *(Retired Scientist)*

2:35 pm: "Mind the Gap" Between Old and New Nuclear Qualified Cable: Lessons Learned from Aging, Historical Adverse Events and Other Nuclear Cable Issues, Lawrence Cunningham *(CableLAN Nuclear)*, invited

3:00 pm: Nuclear Electrical Penetrator Assemblies and Connectors for Small Modular and Other Advanced Reactors, Pat Kumar *(Teledyne Brown Eng)*, invited

WEDNESDAY, AUGUST 21
TECHNICAL SESSIONS - 3:45 PM

PWR Oxides and Deposits—II
Cochairs: Sergio Lozano Perez *(Univ of Oxford)*, Bryan Miller *(NNL)*, Jared Smith *(CNL)*
Location: Seaport BC **Time:** 3:45-5:00 pm

3:45 pm: Coupling Effect of Charged-Hydrogen and Cold Work on Oxidation Behavior of 316L Stainless Steel in Deaerated High Temperature Water, Tongming Cui, Jiarong Ma, Fei Ning, Zhanpeng Lu, Kun Zhang, Yibo Jia *(Shanghai Univ)*, Tetsuo Shoji *(Tohoku Univ)*

4:10 pm: Characteristics of Oxide Films Formed on 309L and 308L Stainless Steels in Simulated PWR Primary Water, Qi Xiong, Jiarong Ma, Kun Zhang, Tongming Cui, Zhanpeng Lu, Junjie Chen, Yibo Jia *(Shanghai Univ)*

4:35 pm: Impact of the Startup Temperature and Primary Chemistry Program on the Oxidation and Release of Corrosion Products from Alloy 690 Steam Generator, Julie Flambard, Florence Carette, Carole Monchy-Leroy, Martin Bachet, Hadrien Perron *(EdF R&D)*, Lydia Laffont *(CIRIMAT)*

Cables—II
Cochairs: Leo S. Fifield *(PNNL)*, Raihan Khondker *(STP Nuclear Operating Co.)*, Robert Duckworth *(ORNL)*
Location: Flagship **Time:** 3:45-5:25 pm

3:45 pm: Spatial Resolution of a Cable Fault Location Attempt by Frequency Domain Reflectometry, Yoshimichi Ohki, Naoshi Hirai *(Waseda Univ)*

4:10 pm: Inter-Digital Capacitive Sensor for Evaluating Cable Insulation Through Jacket, S. W. Glass, L. S. Fifield *(PNNL)*, A. Sriraman, N. Bowler, *(Iowa State Univ)*

4:35 pm: Parameter Sensitivity of Interdigital Sensors for their Design for Cable Insulation Aging Detection, Md. Nazmul Al-Imran *(Univ of South Carolina)*, S. W. Glass, Leonard S. Fifield *(PNNL)*, Mohammod Ali *(Univ of South Carolina)*

5:00 pm: Characterizing and Quantifying the Aging of Polyethylene Thin Films Using Novel Doped-Films and Gold Nanoparticle Labeling Strategies Toward Understanding Failure of Cabling Insulation, Daniel Zoltek, Tana O'Keef, Faith Murphy, Magdalene B. Jones *(Univ of Minnesota, Duluth)*, Robert C. Duckworth *(ORNL)*, Brian Hinderliter, Melissa Ann Maurer-Jones *(Univ of Minnesota, Duluth)*

POSTER SESSION - 5:30 PM

Poster Session
Location: Plaza Ballroom C **Time:** 5:30-7:00 pm

1. Microstructural Characterization of Steam Generator Tube Flakes from an Operating PWR and Its Galvanic Corrosion Behavior, Soon-Hyeok Jeon, Geun Dong Song, Do Haeng Hur *(KAERI)*
2. Exploration of Inverse Temperature Effects in Cable Insulation Aging, Leonard S. Fifield, Mark K. Murphy, Andy W. Zwoster *(PNNL)*
3. Evaluation of the Influence of Irradiation Dose Rate on Crack Growth Behavior of Irradiation Assisted Stress Corrosion Cracking for Neutron-Irradiated Stainless Steels in High-Temperature Water of a Boiling Water Reactor, Masato Koshiishi *(Nippon Nuclear Fuel Development Co., Ltd.)*, Ryoji Obata *(Hitachi-GE Nuclear Energy)*, Hiroyuki Nakano, Takayuki Kaminaga *(TEPCO)*
4. Electrical Breakdown Strength and AC Withstand in Harvested EPR Insulations for Nuclear Power Plants, Robert Duckworth, Alvin Ellis, Tam Ha *(ORNL)*
5. Thermal Conductivity Improvement of Alloy 690, Young Suk Kim, Sung Soo Kim (KAERI), Tae Youl Choi *(Univ of North Texas)*
6. Effects of Thermal Degradation on the Structure and Mechanical Properties of Flame-Retardant Ethylene Propylene Rubber, Hikaru Yamaguchi, Takuya Kaneko, Naoshi Hirai, Yoshimichi Ohki *(Waseda Univ)*

Technical Sessions: Wednesday August 21

WEDNESDAY, AUGUST 21
POSTER SESSION - 5:30 PM

Poster Session Continued
Location: Plaza Ballroom C **Time:** 5:30-7:00 pm

7. Effects of Carbon Concentration on Kinetics of SRO Reaction in Alloy 690, Sung Soo Kim, Young Suk Kim, J. Y. Jung *(KAERI)*

8. Composition and Structure of Oxide Growth on APMT and T91 Alloys After Exposure to Loss-of-Coolant Accident Temperatures, Trishelle Copeland-Johnson, Nicola Bowler *(Iowa State Univ)*, Simerjeet K. Gill, Lynne E. Ecker *(BNL)*, Raul B. Rebak *(General Electric Global Research & Development Center)*

9. Effect of Post-Irradiation Annealing on the Stress Corrosion Crack Growth Behaviour of Neutron-Irradiated 304LStainless Steel in Boiling Water Reactor Environment, Wenjun Kuang *(Xi'an Jiao Tong Univ/Univ of Michigan)*, Justin Hesterberg, Zhijie, Gary S.Was *(Univ of Michigan)*

10. Degradation of Cross-Linked Polyethylene Induced by Simulated Severe Accident Aging, Yu Miyazaki, Hikaru Yamaguchi, Seitaro Ito, Takefumi Minakawa, Naoshi Hirai, Yoshimichi Ohki *(Waseda Univ)*

11. Computational Modeling of Electrochemical Impedance Spectroscopy and Medium Voltage Cable Failure, Adam Finke, Isaiah Salinas, Melissa A. Maurer-Jones *(Univ of Minnesota, Duluth)*, Robert C. Duckworth *(ORNL)*, Keith B. Lodge, Brian R. Hinderliter *(Univ of Minnesota, Duluth)*

12. Effects of NaOH Spray on Insulation Performance of Cables Under Simulated Severe Accident Conditions, Takefumi Minakawa *(S/NRA/R/Waseda Univ)*, Masaaki Ikeda *(S/NRA/R)*, Naoshi Hirai, Yoshimichi Ohki *(Waseda Univ)*

13. Effect of Hydrogen and Thermal Aging on Thermally Treated Nickel-Base Alloy 690, Caitlin Huotilainen *(VTT Technical Research Centre of Finland Ltd.)*, Roman Mouginot *(PSI)*, Yuri Yagodzinskyy, Evgenii Malitckii *(Aalto Univ)*, Matias Ahonen *(VTT Technical Research Centre of Finland Ltd.)*, Hannu Hänninen *(Aalto Univ)*

14. Studies of Crack Initiation with Constant Extension Rate Testing, Mariia Zimina, Anna Hojna, Michal Chocholoušek, Zbyněk Špirit *(Centrum vyzkumu Řež)*

15. Cable Insulation Polyethylene/Polypropylene Degradation Property Changes Employing Electrochemical Impedance Spectrometry, Brian R. Hinderliter, Alexander Carlberg, Melissa Maurer-Jones, Robert C. Duckworth *(Univ of Minnesota Duluth)*

16. The Determination of the Reaction Rates, Water Vapor Permeability, and Activation Energies for Thermal Oxidation of LDPE Films, Noumon Munir, Keith B. Lodge, Brian Hinderliter, Melissa A. Maurer-Jones *(Univ of Minnesota, Duluth)*, Robert Duckworth *(ORNL)*

17. Chemical Species Migration Between CPE Cable Jacket and EPR Insulation Layers as a Function of Thermal Aging, Aishwarya Sriraman *(Iowa State Univ)*, Leonard S. Fifield, S. W. (Bill) Glass *(PNNL)*, Nicola Bowler *(Iowa State Univ)*

18. Microstructural Characterization of the Through-Wall Thickness Pressure Vessel Weldment of the Zion NPP, Philip D Edmondson, Thomas M Rosseel, Mikhail A Sokolov *(ORNL)*

19. Effects of Dry, Wet-Dry Cycling and Aqueous Immersion on Polypropylene and Polyethylene Cable Insulation Mechanical Properties, Isaiah Salinas, Adam Finke, Brian Hinderliter, Keith B. Lodge, Melissa A. Maurer-Jones *(Univ of Minnesota, Duluth)*, Robert Duckworth *(ORNL)*

20. Preliminary Characterization of RPV Materials Harvested from the Decommissioned Zion Unit 1 Nuclear Power Plant, Mikhail A. Sokolov, Thomas M. Rosseel, Philip D. Edmondson, Xiang Chen, Randy K. Nanstad *(ORNL)*

21. Microstructural Characterization of Reactor Cavity Concrete, J. David Arregui-Mena, Elena Tajuelo Rodriguez, Alain B. Giorla *(ORNL)*, Christa E. Torrence *(Texas A&M)*, Philip D. Edmondson, Yann Le Pape, Thomas M. Rosseel *(ORNL)*

WEDNESDAY, AUGUST 21
POSTER SESSION - 5:30 PM

Poster Session Continued
Location: Plaza Ballroom C **Time:** 5:30-7:00 pm

22. Stabilizing Gamma Hydrides in Zr Through Mechanical Stress, Jacob L. Bair, Shawn L. Riechers, Nicole R. Overman, David G. Abrecht, Erin I. Barker, Edgar C. Buck *(PNNL)*

23. Development of Mo-Free Low Alloy Steels for Mitigation of Flow Accelerated Corrosion in Secondary Side of PWRs, Seunghyun Kim, Gi Dong Kim *(KIMS)*, Ji Hyun Kim *(UNIST)*

24. Advanced Characterization of Additively Manufactured Type 316L Stainless Steel, Karen Henry, Nathan Lewis, Robert Morris, Chelsea Snyder, Steve Attanasio *(NNL)*

25. The Precipitation of the Secondary Phase in Inconel 617 Alloy During Aging Process, Hui Li, Wenqing Liu *(Shanghai Univ)*

26. Multi-Scale Mechanical Testing of Zr-2.5 wt% Nb Alloy, Vineet Bhakhri, Cameron Howard, Daniel Arnold, Chris Dixon, Clinton Mayhew, Colin Judge, Sterling St Lawrence *(CNL)*

27. Emulation of Neutron Damage in Zirconium Alloys by Proton Irradiation, Mukesh Bachhav, Jian Gan *(INL)*, Daniel Jadernas *(Studsvik Nuclear AB)*, Arthur T. Motta, Evrard Lacroix, Joshua S. Bowman *(Penn State Univ)*, Gary S. Was, Peng Wang *(Univ of Michigan)*

28. Analytical Comparison of Intergranular Corrosion in Alloy 600 from Stressed and Unstressed Samples D. K. Schreiber, Z. Zhai, K. Kruska, M. J. Olszta, M. B. Toloczko, S. M. Bruemmer *(PNNL)*

29. Phase Stability of Ni/Ni3Al Multilayer Structures Under Thermal Annealing and Ion Irradiation, Cheng Sun *(INL)*, Stuart A. Maloy, Yongqiang Wang, Kevin Baldwin *(LANL)*

30. Atom Probe Tomography Characterization of Fe Segregation at β-Nb Precipitate in Zr-2.5Nb Alloy, Xue Lianga, Qiang Lia *(Shanghai Univ)*, Qingdong Liu *(Shanghai Jiao Tong Univ)*, Jiao Huang, Meiyi Yao, Hui Lia, Yifeng Li *(Shanghai Univ)*

31. Characterisation of Grain Boundary Oxides and Surface Oxide Evolution on A690 in Simulated PWR Primary Water, Tahira Suleman, M. Grace Burke, Jonathan Duff, F. Scenini *(Univ of Manchester)*, Tony Horner, Andrew Barrow *(Rolls-Royce)*

Technical Sessions: Thursday August 22

THURSDAY, AUGUST 22
TECHNICAL SESSIONS - 8:20 AM

Special Topics—I
Cochairs: Raj Pathania *(EPRI)*, Thierry Couvant *(EdF)*, Hong Pyo Kim *(KAERI)*
Location: Seaport A **Time:** 8:20-10:00 am

8:20 am: Effects of Aging Temperature and Alloy Composition on Long-Range Ordering in Ni-Cr-Fe Alloys During Isothermal Aging, Xiangkun Ru *(Shanghai Electric Nuclear Power Group)*, Zhanpeng Lu, Jiarong Ma *(Shanghai Univ)*, Chengdong Yang, Qian Yuan, Weibao Tang *(Shanghai Electric Nuclear Power Group)*

8:45 am: Degradation Effects of Hydrogen and High-Temperature Water Environments on the Fracture Resistance of Low-Alloy RPV Steels, Z. Que, H. P. Seifert, P. Spätig, J. Holzer, A. Zhang, G. S. Rao, S. Ritter *(PSI)*

9:10 am: Tribocorrosion Phenomena in Co- and Fe-Based Hardfacing Alloys Evaluated Using Pin-on-Disc Wear Tests in a Simulated PWR Environment, V. L. Ratia, M. J. Carrington,, D. Zhang, J. L. Daure, D. G. McCartney P. H. Shipway, *(Univ of Nottingham)*, D. A. Stewart *(Rolls Royce plc)*

9:35 am: Effects of Gamma Ray Irradiation on Corrosion of Carbon Steels at Water Line, Tomomichi Ariga, Hiroshi Abe, Yutaka Watanabe *(Tohoku Univ)*

PWR Stainless Steel Initiation
Cochairs: Gabriel Ilevbare *(INL)*, Renate Kilian *(Framatome GmbH)*, M. Grace Burke *(Univ of Manchester)*
Location: Seaport BC **Time:** 8:20-10:00 am

8:20 am: Influence of the Combination of Microstructure and Mechanical Fields on Stress Corrosion Cracking Initiation of Cold-Worked Austenitic Stainless Steels, Qi Huang *(PSL Research Univ/Univ Paris)*, Yann Charles *(Univ Paris)*, Cècilie Duhamel *(PSL Research Univ/Univ Paris)*, Monique Gaspérini *(Univ Paris)*, Jérôme Crépin *(PSL Research Univ/Univ Paris)*

8:45 am: Effect of Martensite on SCC Initiation in Austenitic Stainless Steels in Simulated PWR Primary Water Environment, Litao Chang, M. Grace Burke, Jonathan Duff, Fabio Scenini *(Univ of Manchester)*

9:10 am: Effect of Aerated Transients on Oxidation and SCC of Stainless Steels in PWR Primary Water, Marc Maisonneuve *(CEA/PSL Univ)*, Cécilie Duhamel *(PSL Research Univ)*, Catherine Guerre *(CEA)*, Jérôme Crépin *(PSL Research Univ)*, Ian de Curières *(IRSN)*

9:35 am: Effect of Strain and Strain Rate on Crack Initiation of 316L Steel in the Simulated PWR Water, Anna Hojná, Mariia Zimina *(Centrum výzkumu Řež)*, Lukáš Horák *(Charles Univ)*

Advances in Materials Computational Modeling—I
Cochairs: Yongfeng Zhang *(INL)*, Ben Anglin *(NNL)*, Matthew Olszta *(PNNL)*
Location: Flagship **Time:** 8:20-10:00 am

8:20 am: The Effect of Irradiation-Induced Matrix Barrier Hardening on Irradiation-Assisted Stress Corrosion Cracking (IASCC) in Austenitic Steels and Nickel Based Alloys, R. G. Faulkner *(Loughborough Materials Ltd)*

8:45 am: Stress Assessment of Baffle Former Bolt of PWR Reactor for IASCC, A. M. Pandit, F. J. Blom, P. J. Baas *(NRG)*

9:10 am: Simulating the Susceptibility to IGSCC of Cold Work 316 Austenitic Stainless Steel Exposed to Primary Water, Thierry Couvant, Emilien Burger, Claire Thaury, Claire Rainasse *(EdF)*

9:35 am: Weibull and Bootstrap Based Probabilistic Fatigue Life Modeling of Stainless Steel Under PWR Coolant Water Environment Condition, Jae Phil Park *(Pusan Univ)*, Subhasish Mohanty *(ANL)*, Chi Bum Bahn *(Pusan Univ)*

THURSDAY, AUGUST 22
TECHNICAL SESSIONS - 10:20 AM

Special Topics—II
Cochairs: Raj Pathania *(EPRI)*, Thierry Couvant *(EdF)*, Hong Pyo Kim *(KAERI)*
Location: Seaport A **Time:** 10:20 am-12:00 pm

10:20 am: Interface Characterization of Candidate Dual-Purpose Barrier Coatings for SiC/SiC Accident Tolerate Fuel Cladding, Joey Kabel *(Univ of California, Berkeley)*, Takaaki Koyanagi, Yutai Katoh *(ORNL)*, Ryan Schoell, Djamel Kaoumi *(NCSU)*, Caen Ang *(Univ of Tennessee, Knoxville)*, Peter Hosemann *(Univ of California, Berkeley/LBNL)*

10:45 am: Corrosion Behavior of Candidate Alloys Used in Supercritical Water Environment, Hsuan-Kan Lin, Tsung-Kuang Yeh, Mei-Ya Wang *(Natl Tsing Hua Univ)*

11:10 am: Insights into Prospective Fusion Reactor Cooling Systems from Fission Reactor Cooling Circuits, T. L. Martin, A. D. Warren, D. Kumar, A. Siberry, R. Springell *(Univ of Bristol)*, R. Holmes, R. Clark, L. Platts, R. Burrows *(NNL)*, C. Harrington, M. Gorley, E. Surrey *(UKAEA)*, S. Rowthu, P. Grundler, S. Ritter *(PSI)*

11:35 am: High Temperature Cyclic Deformation Behavior of an Advanced Austenitic Stainless Steel (Alloy 709), Zeinab Y. Alsmadi, Abdullah S. Alomari *(NCSU)*, N. Kumar *(Univ of Alabama)*, K. L. Murty *(NCSU)*

PWR Stainless Steel SCC and Fatigue Crack Growth—I
Cochairs: Dave Morton *(NNL)*, Fabio Scenini *(Nuclear Advanced Manufacturing)*, Kevin Fisher *(NNL)*
Location: Seaport BC **Time:** 10:20am-12:00 pm

10:20 am: The Stress Intensity Factor Dependence of 304 Stainless Steel SCC Growth in Deaerated Water, David Morton *(NNL)*

10:45 am: Effect of Residual δ-Ferrite on the SCC Behavior of 321 Stainless Steel, Jiamei Wang, Kai Chen, Haozhan Su, Donghai Du, Xianglong Guo, Lefu Zhang, Zhao Shen *(Shanghai Jiao Tong Univ)*

11:10 am: Stress Corrosion Cracking of Stainless Steel Cladding Layers in Simulated PWR Primary Water, Qi Xiong, Tongming Cui, Jiarong Ma, Zhanpeng Lu, Fei Ning, Junjie Chen, Kum Zhang *(Shanghai Univ)*, Zhiming Zhong, Guangdong Han *(State Nuclear Power Plant Service Co.)*

11:35 am: Corrosion Performance of Superaustentic Stainless Steel Al-6xn in High Temperature Water, M. J. Stiger *(NNL)*, B. A. Webler *(Carnegie Mellon Univ)*, J. K. Heuer, R. E. Hermer, W. C. Moshier *(NNL)*

Advances in Materials Computational Modeling—II
Cochairs: Yongfeng Zhang *(INL)*, Ben Anglin *(NNL)*, Matthew Olszta *(PNNL)*
Location: Flagship **Time:** 10:20-11:35 am

10:20 am: Understanding the Evolution of Deformation Structures at Fatigue Crack Tips and Implications for Environmentally Enhanced and Retarded Fatigue Crack Growth, B. D. Miller, D. J. Paraventi, B. S. Anglin, T. W. Webb *(NNL)*

10:45 am: 3D Characterization of Corrosion Fatigue Cracks and Crack Tips Generated in Type 304/304L Stainless Steel During Enhanced and Retarded Fatigue Crack Growth, B. S. Anglin, B. D. Miller, K. B. Fisher, T. W. Webb *(NNL)*

11:10 am: Physically-Based Modeling for Environmental Fatigue Crack Growth in Type 304/304L Stainless Steel, B. S. Anglin, J. R. Brockenbrough, J. A. Savchik, C. B. Geller, T. W. Webb *(NNL)*

Technical Sessions: Thursday August 22

THURSDAY, AUGUST 22
TECHNICAL SESSIONS - 1:20 PM

PWR Secondary Side—I
Cochairs: Michael Wright *(CNL)*, Brent Capell *(EPRI)*, Ian de Curiers *(IRSN)*
Location: Seaport A **Time:** 1:20-3:25 pm

1:20 pm: Investigating Pb-Induced Stress Corrosion Cracking of Alloy 800 via In-Situ XPS, B. Payne *(CNL)*, S. Y. Persaud *(Queen's Univ)*, J. M. Smith *(CNL)*

1:45 pm: Stress Corrosion Crack Initiation of Cold-Worked Alloy 800 in Pb-Containing, Alkaline Environments, Jaganathan Ulaganathan, Jared Smith *(CNL)*

2:10 pm: Electrochemical Behavior of Dilute Electroactive Species on a Heat-Transfer Surface Under Boiling, Caitlin Dever, Jagan Ulaganathan, Stan Klimas *(CNL)*

2:35 pm: Microstructural Characterization of Alloy 690TT Exposed to Pb-Containing Caustic Solutions, G. B. Mazzei, J. Duff, M. G. Burke, F. Scenini *(Univ of Manchester)*, G. Meredith, T. Horner *(Rolls-Royce Nuclear)*

3:00 pm: In-Situ Monitoring of the Corrosion Behavior and Impurity Enrichment of Steam Generator Tube Materials Under PWR Secondary Side Thermal-Hydraulic and Heat Transfer Conditions, Caitlin Huotilainen, Essi Jäppinen, Tiina Ikäläinen, Seppo Peltonen, Timo Saario, Konsta Sipilä *(VTT Technical Research Centre of Finland Ltd.)*

PWR Stainless Steel SCC and Fatigue Crack Growth—II
Cochairs: Dave Morton *(NNL)*, Fabio Scenini *(Nuclear Advanced Manufacturing)*, Kevin Fisher *(NNL)*
Location: Seaport BC **Time:** 1:20-2:35 pm

1:20 pm: Environmentally-Assisted Short Crack Fatigue Testing on Austenitic Stainless Steels, B. E. Coult, A. S. Griffiths, J. P. Beswick, P. J. Gill, N. Platts *(Wood Plc)*, J. M. Smith, G. L. Stevens *(EPRI)*

1:45 pm: Understanding the Effect of Strain Localization on Corrosion Fatigue of Type 304 Austenitic Stainless Steels in High Temperature Water, Hanxiao Wang, Fabio Scenini, João Quinta da Fonseca, M. Grace Burke *(Univ of Manchester)*, Jill Meadows, Norman Platts, David Tice *(Wood plc)*

2:10 pm: Influence of Mean Stress and Environment on Fatigue Behavior of a 304L SS, Ziling Peng *(Pprime Inst/EDF R&D)*, Gilbert Henaff *(Pprime Inst)*, Jean-Christophe Le Roux, Romain Verlet *(EDF R&D)*

Irradiation Assisted SCC (IASCC) Testing—I
Cochairs: Peter L. Andresen *(Andresen Consulting)*, Lefu Zhang *(Shanghai Jiao Tong Univ)*, Anders Jenssen *(Studsvik Nuclear AB)*
Location: Flagship **Time:** 1:20-3:25 pm

1:20 pm: Stress Corrosion Cracking and Fracture Toughness Tests of an Irradiated Type 304 Stainless Steel, Y. Chen, B. Alexandreanu, K. Natesan *(ANL)*, A. S. Rao *(NRC)*

1:45 pm: IASCC Initiation Test of Neutron Irradiated Type 316L Stainless Steel in Simulated BWR Condition to Evaluate Threshold Stress, Kazuhiro Chatani, Shigeaki Tanaka *(Toshiba Energy Systems & Solutions Corp.)*, Hitoshi Seto *(NFD)*, Hiroyuki Nakano, Takayuki Kaminaga *(TEPCO)*

2:10 pm: Irradiation Assisted Stress Corrosion Cracking (IASCC) of Low Strength and High Strength Alloys in Light Water Reactor Environments, M. Wang *(Studsvik Nuclear AB/Univ of Michigan)*, M. Song *(Univ of Michigan)*, L. Nelson *(JLN Consulting)*, R. Pathania *(EPRI)*, Gary S. Was *(Univ of Michigan)*

2:35 pm: IASCC Susceptibility of Highly Irradiated 316 Stainless Steel in Simulated PWR Primary Water, Donghai Du, Gary S. Was *(Univ of Michigan)*

3:00 pm: Irradiation-Assisted Stress Corrosion Cracking of Ti-Stabilized Austenitic Stainless Steel, Miroslava Ernestova *(UJV Rez)*

THURSDAY, AUGUST 22
TECHNICAL SESSIONS - 3:45 PM

PWR Secondary Side—II
Cochairs: Michael Wright *(CNL)*, Brent Capell *(EPRI)*, Ian de Curiers *(IRSN)*
Location: Seaport A **Time:** 3:45-5:25 pm

3:45 pm: Diffusing Hydrogen Effect on the Oxide Film on 316L SS in High Temperature Water, Jiarong Ma, Tongming Cui, Hao Peng, Zhanpeng Lu, Junjie Chen, Yibo Jia *(Shanghai Univ)*

4:10 pm: Influence of Heat Transfer Crevice Conditions on Stress Corrosion Cracking in Lead Faulted Alkaline Environments, Frederick D. Miller *(NNL)*

4:35 pm: Use of On-line Monitoring Techniques for Evaluations of Lead Stress Corrosion Cracking (PbSCC) and a PbSCC Inhibitor, Brent Capell *(EPRI)*, Jared Smith *(CNL)*

5:00 pm: Hydrogen Assisted Oxidation Behavior of Alloy 600 in High Temperature Air Environment by In-Situ H Charging Method, Zihao Wang, Yoichi Takeda *(Tohoku Univ)*

Irradiation Assisted SCC (IASCC)—II
Cochairs: Peter L. Andresen *(Andresen Consulting)*, Lefu Zhang *(Shanghai Jiao Tong Univ)*, Anders Jenssen *(Studsvik Nuclear AB)*
Location: Flagship **Time:** 3:45-5:25 pm

3:45 pm: Nano-Mechanical Testing of Proton Irradiated 304L SS at 100°C and 360°C to Support IASCC, M. A. Mattucci *(CNL)*, Q. Wang *(CNL/Queen's Univ)*, T. Skippon *(CNL)*, M. R. Daymond *(Queen's Univ)*, G. S. Was *(Univ of Michigan)*, J. Smith, C. D. Judge *(CNL)*

4:10 pm: Fracture Behavior of Oxidized Grain Boundary in Neutron-Irradiated Stainless Steel, Terumitsu Miura, Katsuhiko Fujii, Koji Fukuya *(Inst of Nuclear Safety System, Inc.)*, Yuji Kitsunai *(Nippon Nuclear Fuel Development Co., Ltd)*

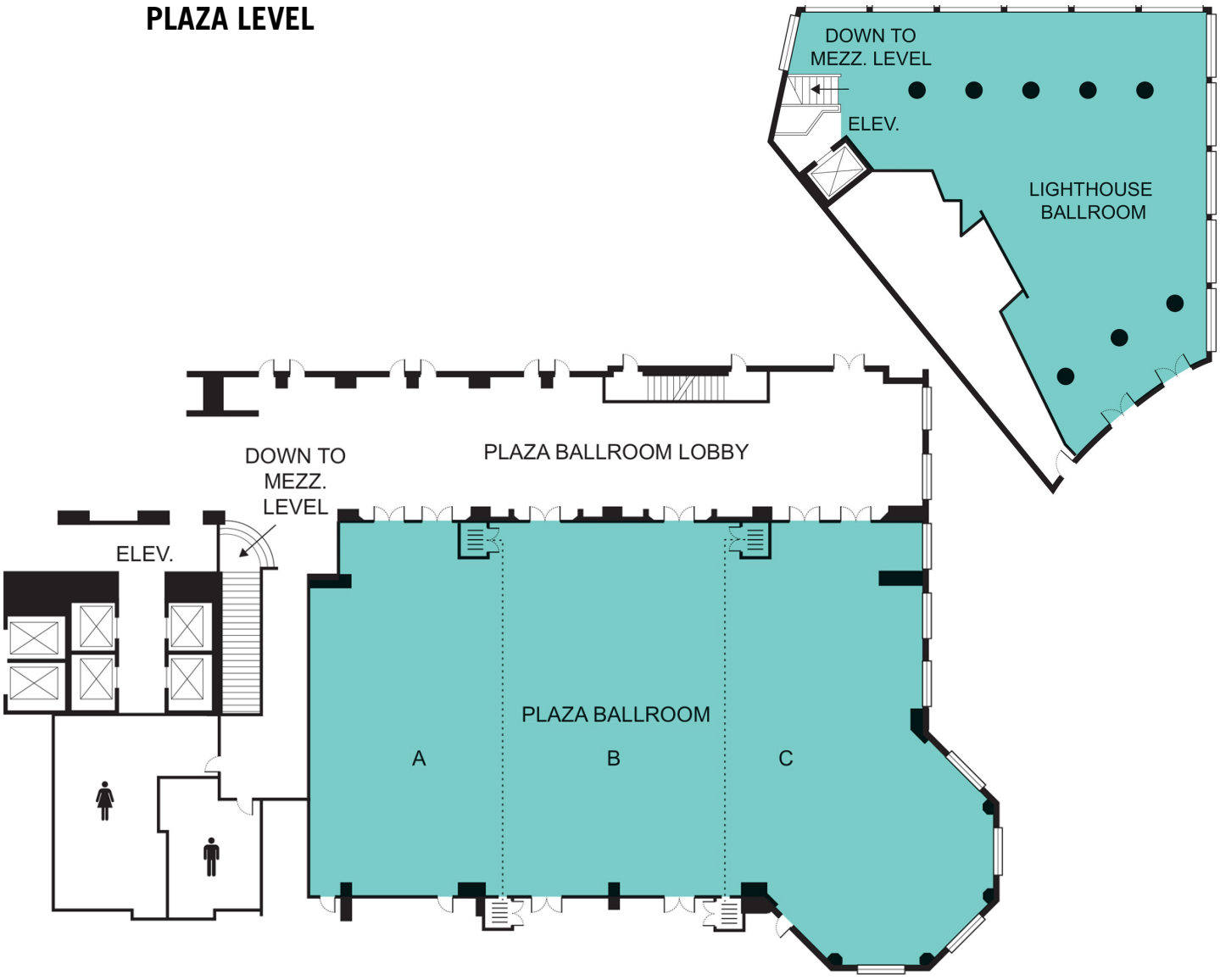
4:35 pm: Specimen Size Effects on the Crack Growth Rate Response of Highly Irradiated Type 304 Stainless Steel, A. Jenssen, J. Stjärnsäter *(Studsvik Nuclear AB)*, C. Topbasi, P. Chou *(EPRI)*

5:00 pm: Empirical Equations of Crack Growth Rates Based on Data Fitting of Neutron Irradiated Stainless Steel Under High Temperature Water Simulating Boiling Water Reactor Core Conditions, Shigeki Kasahara, Yasuhiro Chimi, Kuniki Hata *(JAEA)*, Koji Fukuya, Katsuhiko Fujii *(Inst of Nuclear Safety System. Inc.)*

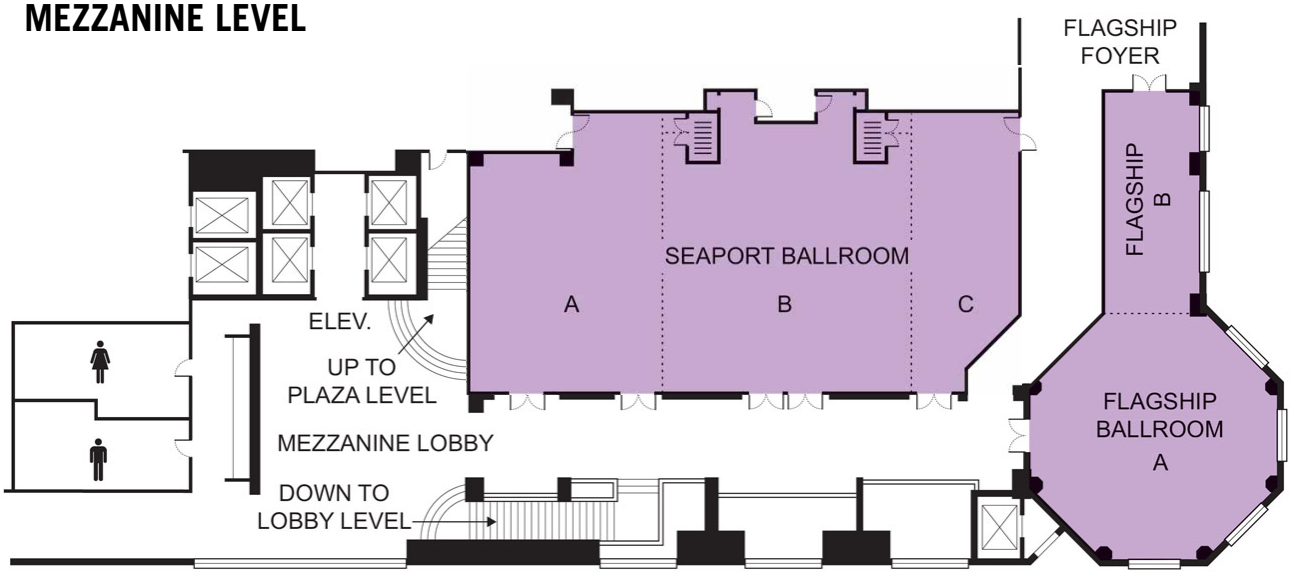
Notes

Hotel Floorplan

PLAZA LEVEL



MEZZANINE LEVEL



ANS Meetings

M&C 2019
AUG 25-29, 2019 | Portland, OR | Marriott Portland Downtown Waterfront

GLOBAL/TOP FUEL 2019
SEP 22-27, 2019 | Seattle, WA | The Westin Seattle

MATERIALS IN NUCLEAR ENERGY SYSTEMS (MINES)
OCT 6-10, 2019 | Baltimore, MD | Hilton Baltimore

2019 ANS WINTER MEETING AND NUCLEAR TECHNOLOGY EXPO
NOV 17-21, 2019 | Washington, DC | Marriott Wardman Park

EMBEDDED TOPICAL MEETING YOUNG PROFESSIONALS CONGRESS (YPC)
NOV 16, 2019 | Washington, DC | Marriott Wardman Park

14TH INTERNATIONAL TOPICAL MEETING ON NUCLEAR APPLICATIONS OF ACCELERATORS (ACCAPP '20)
APR 5-9, 2020 | Vienna, Austria

TECHNOLOGY OF FUSION ENERGY (TOFE) 2020
APR 19-24, 2020 | Charleston, SC

2020 ANS ANNUAL MEETING
JUN 7-11, 2020 | Phoenix, AZ | Arizona Grand Resort & Spa

ICRS 14/RPSD 2020
SEP 13-18, 2020 | Seattle, WA

2020 ANS WINTER MEETING AND NUCLEAR TECHNOLOGY EXPO
NOV 15-19, 2020 | Chicago, IL | Chicago Marriott Downtown