OFFICIAL PROGRAM

International Congress on Advances in Nuclear Power Plants

Nuclear Innovation: Inventing the Future of Existing and New Nuclear Power

ICAPP

San Francisco Travel Association, photo by Scott Chernis

April 17-20, 2016
Hyatt Regency San Francisco
San Francisco, CA

ANS

ANS Meeting Contributors

2016 International Congress on Advances in Nuclear Power Plants (ICAPP 2016)

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University of California, Berkeley

OTHER CONTRIBUTORS

Argonne National Laboratory

EXHIBITORS

Oak Ridge National Laboratory
Southern Nuclear Operating Co.
Idaho National Laboratory

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GENERAL MEETING INFORMATION

PLENARY AND SPECIAL SESSIONS

2016 ICAPP TECHNICAL SESSIONS

ADDITIONAL

Meeting Officials

2016 International Congress on Advances in Nuclear Power Plants

ICAPP 2016

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Virginia Commonwealth University

STUDENT PROGRAM CO-CHAIR:
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Travis W. Knight
University of South Carolina

STEERING COMMITTEE MEMBER
Atam Rao
Principal Consultant

Schedule at a Glance

Sunday, April 17

3:00-8:00 pm	Registration
6:00-8:00 pm	Opening Reception

Monday, April 18

7:00 am-5:00 pm	Registration
7:00-8:00 am	Continental Breakfast (Sponsored by TerraPower)
8:00-10:00 am	Opening Plenary—I: The Need for Innovation in Nuclear Energy Technology
9:30 am-5:00 pm	Tabletop Exhibits
10:00-10:30 am	Morning Break
10:30 am-12:00 pm	Opening Plenary—II: Innovation Worldwide-Views from Around the World
12:00-1:00 pm	Attendee Luncheon (Sponsored by: EPRI)
1:00-2:40 pm	Technical Sessions
2:40-3:00 pm	Afternoon Break
3:00-4:20 pm	Technical Sessions
4:20-6:00 pm	Plenary—II: Innovation in New Reactor Technologies
7:00-10:00 pm	Evening Banquet

Tuesday, April 19

7:00 am-5:00 pm	Registration
7:00-8:00 am	Continental Breakfast
8:00-9:45 am	Plenary—III: Keeping the Operating Plants Healthy and Active
9:30 am-3:30 pm	Tabletop Exhibits
9:45-10:20 am	Morning Break
10:20 am-12:00 pm	Technical Sessions
12:00-1:00 pm	Attendee Luncheon
1:00-2:40 pm	Technical Sessions
2:40-3:00 pm	Afternoon Break
3:00-4:20 pm	Technical Sessions
4:20-6:00 pm	Technical Sessions
5:30-7:00 pm	Student Poster Session (Sponsored by: University of California Berkeley)

Wednesday, April 20

7:00 am-5:00 pm	Registration
7:00-8:00 am	Continental Breakfast
8:00-9:30 am	Plenary—IV: Can Nuclear Catch up with 21st Century Technologies?
9:30-10:00 am	Morning Break
10:00 am-12:00 pm	Technical Sessions
12:00-1:00 pm	Attendee Luncheon
1:00-2:40 pm	Technical Sessions
2:40-3:00 pm	Afternoon Break
3:00-4:20 pm	Technical Sessions
4:30-5:50 pm	Technical Sessions

Thursday, April 21

10:00 am-1:30 pm	Technical Tour: University of California Berkeley (space is limited)

Daily Schedule

Sunday, April 17		Location
3:00-8:00 pm	Registration	Grand Foyer A
6:00-8:00 pm	Opening Reception	Atrium

Monday, April 18		Location
7:00 am-5:00 pm	Registration	Grand Foyer A
7:00-8:00 am	Continental Breakfast *(Sponsored by: TerraPower)*	Grand Foyer A
8:00-10:00 am	Opening Plenary—I: *The Need for Innovation in Nuclear Energy Technology*	Grand Ballroom A
9:30 am-5:00 pm	Tabletop Exhibits	Grand Foyer A
10:00-10:30 am	Morning Break	Grand Foyer A
10:30 am-12:00 pm	Opening Plenary—II: *Innovation Worldwide-Views from Around the World*	Grand Ballroom A
12:00-1:00 pm	Attendee Luncheon *(Sponsored by: EPRI)*	Atrium
1:00-2:40 pm	Technical Sessions	
	• Offshore Nuclear Plants	Grand Ballroom A
	• LWR BDBE Management—I	Golden Gate
	• SFR Design	Marina
	• AR Operations and Maintenance	Seacliff A
	• HTR Neutronics (Joint with Track 6)	Seacliff B
	• HTR Thermal Hydraulics—I (Joint with Track 7)	Seacliff C
	• Station Blackout TH	Seacliff D
	• Radiation and Thermal Degradation of Materials—I	Waterfront AB
2:40-3:00 pm	Afternoon Break	Grand Foyer A
3:00-4:20 pm	Technical Sessions	
	• Advanced Reactor Licensing–Panel	Grand Ballroom A
	• LWR BDBE Management—II (Joint with Track 5)	Golden Gate
	• AR Design Studies—I	Marina
	• AR Instrumentation	Seacliff A
	• SFR Modeling and Simulation	Seacliff B
	• HTR Thermal Hydraulics—II (Joint with Track 7)	Seacliff C
	• Two Phase Flow TH—I	Seacliff D
	• Radiation and Thermal Degradation of Materials—II	Waterfront AB
4:20-6:00 pm	Plenary—II: Innovation in New Reactor Technologies	Grand Ballroom A
7:00-10:00 pm	Evening Banquet	Atrium

Daily Schedule

Tuesday, April 19		Location
7:00 am-5:00 pm	Registration	Grand Foyer A
7:00-8:00 am	Continental Breakfast	Grand Foyer A
8:00-9:45 am	Plenary—III: Keeping the Operating Plants Healthy and Active	Grand Ballroom A
9:30 am-3:30 pm	Tabletop Exhibits	Grand Foyer A
9:45-10:20 am	Morning Break	Grand Foyer A
10:20 am-12:00 pm	Technical Sessions	
	• Flexible Generation	Grand Ballroom A
	• LWR Severe Accidents—I	Golden Gate
	• AR Design Studies—II	Marina
	• AR Fuel Cycles—I	Seacliff A
	• Methods for Reactor Analysis—I	Seacliff B
	• HTR Thermal Hydraulics—III (Joint with Track 7)	Seacliff C
	• Two Phase Flow TH—II	Seacliff D
12:00-1:00 pm	Attendee Luncheon	Atrium
1:00-2:40 pm	Technical Sessions	
	• Power Conversion and Storage	Grand Ballroom A
	• LWR Severe Accidents—II	Golden Gate
	• Molten Salt Reactor Technology	Marina
	• AR Fuel Cycles—II	Seacliff A
	• Methods for Reactor Analysis—II	Seacliff B
	• TH Code Advances—I	Seacliff C
	• Porous Media Thermal Hydraulics	Seacliff D
	• Advanced Materials Technologies	Waterfront AB
2:40-3:00 pm	Afternoon Break	Grand Foyer A
3:00-4:20 pm	Technical Sessions	
	• Advanced Reactor Economics	Grand Ballroom A
	• LWR Severe Accidents—III	Golden Gate
	• AR Simulation Uncertainty Quantification	Marina
	• AR Fluid/Structures Response	Seacliff A
	• Fuel Cycle Modeling	Seacliff B
	• TH Code Advances—II	Seacliff C
	• Instrumentation	Seacliff D
	• Seismic Safety	Waterfront AB
4:20-6:00 pm	Technical Sessions	
	• PRA	Grand Ballroom A
	• LWR Severe Accidents—IV	Golden Gate
	• AR Passive Safety	Marina
	• Liquid Metal/Molten Salt TH—I	Seacliff A
	• Advanced Reactor Power Conversion	Seacliff B
	• TH Code Advances—III	Seacliff C
	• In Service Inspection	Seacliff D
	• Surface Phenomena in Reactor Materials	Waterfront AB
5:30-7:00 pm	Student Poster Session (Posters available all afternoon)	Grand Foyer A

Daily Schedule

Wednesday, April 20

		Location
7:00 am-5:00 pm	Registration	Grand Foyer A
7:00-8:00 am	Continental Breakfast	Grand Foyer A
8:00-9:30 am	Plenary—IV: Can Nuclear Catch up with 21st Century Technologies?	Grand Ballroom A
9:30-10:00 am	Morning Break	Grand Foyer A
10:00 am-12:00 pm	Technical Sessions	
	• LWR Core Design—I (Joint with Track 1)	Golden Gate
	• AR Safety and Licensing—I	Marina
	• Scaled Experiments	Seacliff A
	• Used Fuel Separation Technology	Seacliff B
	• Maintenance	Seacliff C
	• Materials for FHRs/MSRs/LFRs	Seacliff D
	• Liquid Metal/Molten Salt TH—II	Waterfront AB
12:00-1:00 pm	Attendee Luncheon	Atrium
1:00-2:40 pm	Technical Sessions	
	• Kazimi Special Session—I	Grand Ballroom A
	• LWR Core Design—II (Joint with Track 1)	Golden Gate
	• AR Safety and Licensing—II	Marina
	• Passive Heat Transport—I	Seacliff A
	• Fuel Cycle Analysis—I	Seacliff B
	• Severe Accident TH	Seacliff C
	• Accident Management	Seacliff D
	• Welding and Joining Methods	Waterfront AB
2:40-3:00 pm	Afternoon Break	Grand Foyer A
3:00-4:20 pm	Technical Sessions	
	• Kazimi Special Session—II	Grand Ballroom A
	• LWR Modeling and Simulation—I	Golden Gate
	• AR Safety and Licensing—III	Marina
	• Passive Heat Transport—II	Seacliff A
	• Fuel Cycle Analysis—II	Seacliff B
	• CHF/DNB—I	Seacliff C
	• Control Rooms and Simulators—I	Seacliff D
	• LWR BDBE Clad Response (Joint Track 1, 5)	Waterfront AB
4:30-5:50 pm	Technical Sessions	
	• Non-Proliferation and Physical Protection	Grand Ballroom A
	• LWR Modeling and Simulation—II	Golden Gate
	• AR Severe Accidents	Marina
	• CFD Advances	Seacliff A
	• CHF/DNB—II	Seacliff C
	• Control Rooms and Simulators—II	Seacliff D

Thursday, April 21

		Location
10:00 am-1:30 pm	Technical Tour: UC Berkeley Tour, space is limited	Univ of California Berkeley

General Information

MEETING REGISTRATION

ICAPP meeting and speaker registration will be located in the Grand Foyer A of the Hyatt Regency San Francisco, Sunday, April 17– Wednesday, April 20. Meeting registration is required for all attendees and speakers. Badges are required for admission to all plenaries, technical sessions and events.

REGISTRATION HOURS

Sunday, April 17	3:00-8:00 pm
Monday, April 18	7:00 am-5:00 pm
Tuesday, April 19	7:00 am-5:00 pm
Wednesday, April 20	7:00 am-5:00 pm

NOTICE FOR SPEAKERS:

All Speakers and Session Chairs must sign in at the ICAPP Registration Desk during registration hours.

SPEAKER READY ROOM:

Location: Regency B

Sunday, April 17, through Tuesday, April 19 from 8:00 am- 5:00 pm
Wednesday, April 20 from 8:00 am- 4:00 pm

NOTE:

The Opening Reception and Evening Banquet is included with the full meeting registration fee. Badges are requested. Additional tickets for guests can be purchased in advance or on-site at the ICAPP Registration Desk for the Opening Reception, Evening Banquet and the UC Berkeley Technical Tour.

ABOUT ANS

To view the ANS Bylaws, Mission and Code of Ethics make sure to visit www.ans.org/about

MEETING AND HOTEL INFORMATION

The Hyatt Regency San Francisco will be the location for the International Conference on Advances in Nuclear Power Plants, where all activities and technical sessions will take place. The Hyatt Regency San Francisco is located at 5 Embarcadero Center, San Francisco, California, USA, 94111.

Reservations can be made online at:

https://aws.passkey.com/g/50607473

Book your Government Rate at:

https://resweb.passkey.com/go/ICAPP2016.
Access code: ANSGGovernmentRate

Rooms are limited. To make a phone reservation for a guest room, call 888-591-1234. Attendees must identify themselves as part of the ICAPP or American Nuclear Society to receive the group rate.

Plenary, Special Events and Sessions

SUNDAY, APRIL 17

OPENING RECEPTION

Location: Atrium

6:00-8:00 pm

One ticket to the Opening Reception is included in the full meeting registration fee. Additional tickets can be purchased in advance or on-site at the ICAPP Registration Desk for $75.00.

MONDAY, APRIL 18

OPENING PLENARY—I

THE NEED FOR INNOVATION IN NUCLEAR ENERGY TECHNOLOGY

Co-chairs: Gene Grecheck (President, American Nuclear Society), Per Peterson (Univ of California, Berkeley)

Location: Grand Ballroom A

8:00-10:00 am

At the 2015 United Nations Conference on Climate Change in Paris, 20 nations committed to "Mission Innovation," to make the investments needed to accelerate the clean energy revolution. This plenary session will outline visions and strategies for accelerating innovation in nuclear energy, to maximize its future benefits as a key source of clean energy.

SPEAKERS

- Stephen Kuczynski, Chairman, President and CEO, Southern Nuclear Operating Company
- Shane Johnson, Deputy Assistant Secretary for Science and Technology Innovation, DOE-NE's GAIN
- Dr. Mark Peters, Director, Idaho National Laboratory
- Neil M. Wilmshurst, Vice President and CNO, EPRI
- Michael Shellenberger, President, The Breakthrough Institute

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TABLETOP EXHIBITS

Location: Grand Foyer A

Monday, April 18 | 9:30 am-5:00 pm

Tuesday, April 19 | 9:30 am-3:30 pm

MONDAY, APRIL 18

OPENING PLENARY—II

INNOVATION WORLDWIDE-VIEWS FROM AROUND THE WORLD

Co-chairs: Travis Knight (NCSU), Poong Hyun Seong (KAIST)

Location: Grand Ballroom A

10:30 am-12:00 pm

Worldwide, key efforts are underway to accelerate innovation and enable deployment of new nuclear energy infrastructure. This plenary session will highlight key activities and advances around the world, and discuss future directions for the role of nuclear energy.

SPEAKERS

- James Brennan, Senior Vice President, Engineering Center of Excellence
- Takafumi Anegawa of TEPCO – Current CNO and Former Head of R&D
- Mr. Koo Woun Park, President and CEO, KEPCO E&C
- Fiona Rayment, Director, Fuel Cycle Solutions, National Nuclear Laboratory, United Kingdom

MONDAY, APRIL 18

PLENARY—II

INNOVATION IN NEW REACTOR TECHNOLOGIES

Co-chairs: Atambir Rao (Consultant), Amir Afzali (Southern Nuclear)

Location: Grand Ballroom A

4:20-6:00 pm

New reactor technologies ranging from advanced light water reactors, to light water small modular reactors, to Generation IV reactors are in development, some in licensing and, and some in deployment. This plenary session will describe opportunities and challenges faced in current design, licensing and deployment efforts, and provide diverse perspectives on next steps and innovation priorities, and key policy to accelerate further innovation.

- Eugene Grecheck, President, American Nuclear Society
- Kumiaki Moriya, Corporate Chief Engineer, Hitachi-GE Nuclear Energy, Ltd.
- Pierre Oneid, Senior Vice President and Chief Nuclear Officer, Holtec International
- John Gilleland, Chief Technical Officer, TerraPower
- Josh Freed, Vice President for the Clean Energy Program, Third Way

EVENING BANQUET

Location: Atrium

7:00-10:00 pm

Access to the Evening Banquet is included in the full meeting registration fee. Badges are requested. Tickets can be purchased for guests in advance or on-site at the ICAPP Registration Desk for $100.00.

TUESDAY, APRIL 19

PLENARY—III

KEEPING THE OPERATING PLANTS HEALTHY AND ACTIVE

Co-chairs: Sama Bilbao y León (Virginia Commonwealth Univ), Rosa Yang (EPRI)

Location: Grand Ballroom A

8:00-9:45 am

Existing nuclear plants around the world provide the most important test beds where innovations in operations and maintenance are tested and deployed. The major advances in plant reliability achieved over the last few decades have maintained nuclear energy as the world's largest source of clean electricity, but further advances are needed to keep operating plants healthy and active. This plenary session will highlight recent advances, and explore innovative visions for the future of plant operations, maintenance, flexible response, and life extension.

SPEAKERS

- Mamoru Hatazawa, Vice President and Head of Nuclear Business and Technology Power Systems, Toshiba Corporation, Japan
- Ken Christian, Manager of Plant Technical and Equipment Reliability, INPO, USA
- Maria Teresa (Maite) Dominguez Bautista, Director, Advanced Projects, Empresarios Agrupados, Spain
- Don Hoffman, President and CEO, Excel Services, USA

STUDENT POSTER SESSION

Location: Grand Ballroom Foyer

5:30-7:00 pm

Please see page 29 for details.

Plenary, Special Events and Sessions

WEDNESDAY, APRIL 20

PLENARY—IV

CAN NUCLEAR CATCH UP WITH 21ST CENTURY TECHNOLOGIES?

Chair: Jacopo Buongiorno; Co-chair: Andrew Sowder
Location: Grand Ballroom A
8:00-9:30 am

There's a paradox facing the nuclear power industry. On one hand, an exciting range of new fission and fusion reactor technologies has spawned a number of startups. But at the same time, market dynamics and regulatory stiffness have conspired against the uptake of technologies developed in other fields that could bring new options and benefits to the nuclear sector. This plenary session will highlight such innovation opportunities in the fields of robotics, additive manufacturing, shipyard construction and nano-technology.

SPEAKER

- Gunnar Johnson, Head of Hull Design, Marine Analysis and Layout, Sevan Marine

HIGHLIGHTS

- The MIT Cheetah: A Legged Robot for Disaster Response; How Robotics Can Help to Automate Operations, Maintenance and Emergency Response in Nuclear Plants, Sangbae Kim, Professor and Director, Biomimetic Robotics Lab, MIT
- Shipyard Construction: Nuclear Submarines are Built in Less Than 36 Months; Can Nuclear Power Plants Follow Suite?, Fredrik Major, Chief Business Development Officer, Sevan Marine, Norway
- Additive Manufacturing: A Revolutionary Technology for Fabrication of Complex Geometries, Chris Spadaccini, Director, Center for Engineered Materials, Manufacturing and Optimization, Lawrence Livermore National Lab
- Nano-Engineered Materials for Nuclear Applications, Dong Chan Jang, Professor and Director Radiation Materials and Nanomechanics Lab, KAIST

THURSDAY, APRIL 21

TECHNICAL TOUR

UC BERKELEY TOUR

Location: University of California Berkeley
10:00 am-1:30 pm

Departing from the hotel lobby at 9:00 am – arriving back at the hotel by 2:30 pm

This tour of UC Berkeley Nuclear Engineering labs will visit laboratories for nuclear materials testing, thermal hydraulics, neutron generation, radiation detection and imaging, and computation, and meet students working in these laboratories. These laboratories perform research for a wide range of applications, including advanced reactor safety and licensing, materials reliability and performance for existing and advanced reactors, geochronology, and detection and imaging for medicine and nuclear security. The tour will include a visit to the new Compact Integral Effects Test facility, one of the latest IET facilities built at a university to generate data for advanced reactor safety code validation. Additionally, the campus tour will highlight historical locations around the campus, including Gilman Hall where Glenn Seaborg discovered plutonium. Lunch at the Faculty Club, designed in the 1920's by John Galen Howard, will provide an opportunity for tour participants to discuss the visit and enjoy the ambiance of the Great Hall and its outdoor patio. Tickets can be purchased online or at the ICAPP Registration Desk (if available). You must be registered for the meeting to purchase a ticket, the cost is $50.00. Space is limited.

TECHNICAL SESSIONS - 1:00-2:40 PM

OFFSHORE NUCLEAR PLANTS

Co-chairs: George F. Flanagan (ORNL), Didier J. DeBruyn (SCK/CEN)
Location: Grand Ballroom A

1:00 pm
16649 Construction and Transportation of the Offshore Floating Nuclear Plant (OFNP), J. Jurewicz, J. Buongiorno, M. Golay, N. Todreas (MIT), F. Major, O. Skjastad (Sevan Marine ASA)

1:20 pm
16322 Safety of the Offshore Floating Nuclear Plant (OFNP), J. Buongiorno, M. Golay, N. Todreas, J.Zhang, J. Jurewicz (MIT), L. Conway (Consultant), M. Corradini (Univ of Wisconsin, Madison)

1:40 pm
Concept Design of the TLP Type Offshore Nuclear Power Plants, ChaeMin Lee, JaeMin Kim, Kang-Heon Lee, Min-Gil Kim, Jeong-Ik Lee, Phill-Seung Lee (KAIST)

2:00 pm
Nuclear Offshore: A New Paradigm for Construction, Siting and Operations of Nuclear Plants, Jacopo Buongiorno, Michael W. Golay, Neil E. Todreas (MIT)

2:20 pm
Shipyard Construction of the Offshore Floating Nuclear Power Plant, Fredrik Major (Sevan Marine, Norway)

LWR BDBE MANAGEMENT—I

Co-chairs: Md. Alamgir (GE Hitachi Nuclear Energy), Paolo Ferroni (Westinghouse)
Location: Golden Gate

1:00 pm
15832 Improvements on French Nuclear Power Plants Following Fukushima Accidents and Consistency with New WENRA Safety Reference Levels, Tania Veneau, François Cabane, Jean Barbaud (EdF)

1:20 pm
16714 AP1000® Beyond Design Basis Mitigating Strategies, Ibrahim B. Ezelarab, Thomas A. Kindred (Westinghouse)

1:40 pm
16314 Severe Accident Analysis on Mixed Core Supercritical Water Reactor (SCWR-M), Zhen Cao, Xiaojing Liu, Xu Cheng (Shanghai Jiao Tong Univ)

2:00 pm
16503 Validating GOTHIC™ Against Rapid Boron Dilution Transients (ISP-43), Patrick Skelton, Jeffrey Lane (Zachry Nuclear Eng)

SFR DESIGN

Co-chairs: Richard B. Vilim (ANL), Christian H. Latge (CEA)
Location: Marina

1:00 pm
16163 Pre-Conceptual Design of ASTRID Fuel Sub-Assemblies, Thierry Beck, Victor Blanc, Jean-Michel Escleine, Michel Pelletier, Mayeul Phélip (CEA), Benoît Perrin (AREVA NP)

1:20 pm
16323 Study of the Design Choices Scalability to Higher Power Level for an ASTRID-Like Sodium Cooled Fast Reactor, Florent Barjot (EdF R&D), Guillaume Giudicelli (Mines Paristesh), Damien Schmitt (EdF R&D)

1:40 pm
16460 On Core-Reflector Interface Effects in the Astrid Sodium Cooled Fast Reactor, D. Blanchet, Q. Barreau, B. Fontaine (CEA)

2:00 pm
16404 Methodology to Account for Load Factor and Availability during Conceptual Design Phase of a GEN IV Nuclear Power Plant, Vernhet Didier (CEA), Libessart Martin (Airbus Defense and Space))

Technical Sessions: Monday April 18

TECHNICAL SESSIONS - 1:00-2:40 PM

AR OPERATIONS AND MAINTENANCE

Co-chairs: David Wooten (PNNL), Hidemasa Yamano (JAEA)
Location: Seacliff A

1:00 pm
16415 Lessons Learned about Liquid Metal Reactors from FFTF Experience, D. W. Wootan, A. M. Casella, R. P. Omberg (PNNL), T. M. Burke (Westinghouse Handford-retired), C. Grandy (ANL)

1:20 pm
16339 Accomplishment of Restoration Work in Reactor Vessel of Experimental Fast Reactor Joyo (1)—Replacement of Upper Core Structure, Katsu Ohta, Hirotaka Kawahara, Hiromichi Ito, Tetsuhiko Kobayashi, Misao Takamatsu, Akinori Nagai (JAEA), Masahide Hara, Ryuta Sakao, Jyunya Tanaka, Takahiro Tatsuno, Hiroyoshi Okazaki, Isao Kanatani (Mitsubishi)

1:40 pm
16363 Accomplishment of Restoration Work in Reactor Vessel of Experimental Fast Reactor Joyo (2)—Retrieval of Bent Irradiation Test Subassembly in Reactor Vessel, Takashi Ashida, Toshiyuki Nakamura, Hideaki Ito, Wataru Itagaki,Takakazu Saito, Tomonori Soga (JAEA), Kazuhiro Koga, Norikazu Oohara, Hiroichi Ino, Katsumi Kondo (Fuji Electric Co., Ltd.)

2:00 pm
16389 ASTRID: Operation Procedures to Comply with Grid Regulation and a Plant Lifetime up to 60 Years, D. Barbier (CEA), J. M. Cherel (AREVA), D. Settimo (EdF), invited

HTR NEUTRONICS (JOINT WITH TRACK 6)

Co-chairs: Akansha Kumar (INL), Michael A. Fütterer (JRC Petten)
Location: Seacliff B

1:00 pm
16436 Implementation of the Generalized Adjoint Equation Solver for Double Heterogeneity Model Treatment of a VHTR Core, Tae Young Han, Hyun Chul Lee (KAERI)

1:20 pm
16613 Optimization of the Separate Loading Schemes in Th-LEU-Fueled HTR-PM for In Situ Utilization of Thorium, Bing Xia, Fu Li, Chunlin Wei, Fubing Chen (Tsinghua Univ)

1:40 pm
16627 Preliminary Neutronics Assessment of Fully Ceramic Microencapsulated Fuel in High-Temperature Gas-Cooled Reactors, Jeffrey J. Powers (ORNL)

HTR THERMAL HYDRAULICS—I (JOINT WITH TRACK 7)

Co-chairs: Gerhard Strydom (INL), Kun Chen (Shanghai Inst of Applied Physics)
Location: Seacliff C

1:00 pm
16409 Uncertainty Propagation of Coolant Properties in a Fluoride Salt-Cooled High Temperature Test Reactor, R. R. Romatoski, L. W. Hu, C. W. Forsberg (MIT)

1:20 pm
16424 Performance of a Vortex Diode in a Fluoride Salt Cooled High Temperature Reactor, Wu Yanhua, Chuangxiong Cai,Shixiang Qu, Zhaozhong He, Kun Chen (Chinese Academy of Sciences)

1:40 pm
16593 Preliminary Model Validation for Thermal Hydraulic Integral Transient Behavior in Fluoride-Salt-Cooled High-Temperature Reactors, C. Poresky, J. Kendrick, N. Zweibaum, P. F. Peterson (Univ of California, Berkeley)

2:00 pm
16598 Observations of Flow Instability in a Heated Narrow Vertical Slot in the UCB CIET Facility, J. C. Kendrick, A. J. Novak, C. M. Poresky, N. Zweibaum, P. F. Peterson (Univ of California, Berkeley)

2:20 pm
16801 The Use of Frequency Response Techniques for the Measurement of Heat Transfer Coefficients in Pebble-Beds Cooled by Fluoride Salts using Simulant Fluids, Lakshana Huddar, Ali James Albaaj, Jeff Bickel, Connie Lee, Per F. Peterson (Univ of California, Berkeley)

TECHNICAL SESSIONS - 1:00-2:40 PM

STATION BLACKOUT THERMAL HYDRAULICS

Co-chairs: In Cheol Bang (UNIST), Marco Pellegrini (Inst of Applied Energy)
Location: Seacliff D

1:00 pm
16418 A Study of BWR Mark I Station Blackout Accident with GOTHIC Modeling, Han Bao, Nam Dinh, Olumuyiwa Omotowa (NCSU), Haihua Zhao, Hongbin Zhang, Ling Zou, Ronaldo H. Szilard (INL)

1:20 pm
16472 Hybrid Heat Pipe-Control Rod Development for Nuclear Applications: PWR, SMR, Spent Fuel Storage and Gen-IV Reactors, In Cheol Bang, Kyung Mo Kim, In Guk Kim,Yeong Shin Jeong (UNIST), Dong Wook Jerng (Chung-Ang Univ)

1:40 pm
16580 Development of ATLAS Test Scenario for SBO with RCP Seal Leakage using MARS Code, Seung Jong Oh, Sang Yong Lee, Quang Huy Pham (KINGS)

2:00 pm
16585 Evaluation of Extended Loss of AC Power Event and Mitigation Strategy in Maanshan PWR using TRACE Code, Jung HuaYang, Jong Rong Wang, Chunkuan Shih (Natl Tsing Hua Univ/Nuclear and New Energy Education and Research Foundation), Shao-WenChen, Yu Chiang (Natl Tsing Hua Univ)

2:20 pm
16623 Long-Term Passive Residual Heat Removal in the AP1000® Reactor, Richard F. Wright, Alan J. Macdonald, Thomas A. Kindred, (Westinghouse), Kevin B. Ramsden (Fauske & Assoc)

RADIATION AND THERMAL DEGRADATION OF MATERIALS—I

Co-chairs: Brian Wirth (Univ of Tennessee), Celine J. Cabet (CEA)
Location: Waterfront AB

1:00 pm
16556 Initial Studies on the Correlation of Nanohardness to Engineering-Scale Properties of Neutron-Irradiated Steels, D. L. Krumwiede, M. D. Abad (Univ of California, Berkeley), T. A. Saleh, S. A. Maloy (LANL), G. R. Odette, T. Yamamoto (Univ. California, Santa Barbara), P. Hosemann (Univ of California, Berkeley)

1:20 pm
16599 In-Pile Creep and Swelling of FeCrAl Alloys and Impact on Fuel Pin Behavior, K. A. Terrani (ORNL), R. Sweet (Univ of Tennessee, Knoxville), Y. Yamamoto (ORNL), T. Karlsen (Halden Reactor Project), B. D. Wirth (ORNL/Univ of Tennessee)

1:40 pm
16631 Evaluation of Mechanical Properties of 304 SS after Proton Irradiation using Small Scale Mechanical Testing, H. Vo, A. Reichardt, D. Frazer, C. Howard, M. D. Abad (Univ of California,Berkeley), P. Chou (EPRI), P. Hosemann (Univ of California, Berkeley)

2:00 pm
16461 Use of Small Specimens for Fracture Toughness Evaluation of RPV Steels, Mikhail A. Sokolov, Randy K. Nanstad (ORNL)

TECHNICAL SESSIONS - 3:00-4:20 PM

ADVANCED REACTOR LICENSING–PANEL

Co-chairs: George F. Flanagan (ORNL), Edward D. Blandford (Univ of New Mexico)
Location: Grand Ballroom A

Panelists:
Jan Mazza or Diane Jackson (NRC)
Mark Holbrook (INL)
Amir Afzali (Southern Co.)
George Flanagan (ANS Standards Board Chairman)

Technical Sessions: Monday April 18

TECHNICAL SESSIONS - 3:00-4:20 PM

LWR BDBE MANAGEMENT—II (JOINT WITH TRACK 5)

Co-chairs: Md. Alamgir (GE Hitachi Nuclear Energy), Paolo Ferroni (Westinghouse)
Location: Golden Gate

3:00 pm
15914 Multifunction Model Features and Current Status for BWR Core Degradation, Tsuyoshi Okawa, Tetsuo Nakajima (NRA)

3:20 pm
16606 iB1350—A Generation III.7 Reactor after the Fukushima Daiichi Accident, Takashi Sato, Keiji Matsumoto, Kenji Hosomi, Keisuke Taguchi (Toshiba)

3:40 pm
16170 Underground Nuclear Power Plants: An Old Idea That Should be Reconsidered?, Didier De Bruyn (SCK/CEN), Shunsuke Sakurai (Kobe Univ), Pierre Duffaut, Carl W. Myers (Consultant)

4:00 pm
Recommended Spent Fuel Pool Surveillance Frequencies Following Extreme External Events, Franklin W. Hope (Jensen Hughes)

AR DESIGN STUDIES—I

Co-chairs: Pavel V. Tsvetkov (Texas A&M), Robert C. Petroski (TerraPower)
Location: Marina

3:00 pm
15849 Two Concepts for Increasing Safety and Reducing the Cost of a Small Modular Sodium Cooled Reactor (S-PRISM), Chuck Boardman (Consultant)

3:20 pm
16140 Recent Developments in the Design of the Belgian MYRRHA ADS Facility, Didier De Bruyn, Rafaël Fernandez, Jeroen Engelen (SCK/CEN)

3:40 pm
16400 Technology Assessment of an Advanced Reactor Design—A Case Study on a Molten Salt Reactor (MSR), Bethany Burkhardt, Steven Krahn, Timothy Ault, Allen Croff (Vanderbilt Univ), Andrew Sowder (EPRI), Nick Irvin, Nick Smith (Southern Co.)

4:00 pm
16263 Converging Fission and Fusion Systems Toward High-Temperature Liquid-Salt Coolants: Implications for Research and Development Strategies, Charles Forsberg, Dennis Whyte (MIT)

TECHNICAL SESSIONS - 3:00-4:20 PM

AR INSTRUMENTATION

Co-chairs: Brian Woods (Oregon State Univ), Pradeep Ramuhalli (Ohio State)
Location: Seacliff A

3:00 pm
16275 Demonstration of Eddy Current Type Flow Meter in Monju, Kosuke Aizawa, Yoshitaka Chikazawa, Yuko Morohashi (JAEA)

3:20 pm
16775 Nondestructive Measurements for Diagnostics of Advanced Reactor Passive Components, M. Prowant, G. Dib, S. Roy, L. Luzi, P. Ramuhalli (PNNL)

3:40 pm
16467 Development of Microelectromechanical Systems (MEMS) Sensors for High Temperature Gas Reactor Core Environments, M. A. Hertel, B. G. Woods, J. Cox (Oregon State Univ)

4:00 pm
16450 Applying Digital Technologies to Strengthen Safety and Improve Competitiveness in the Nuclear Industry, Simon Huffeteau (Dassault Systèmes)

SFR MODELING AND SIMULATION

Co-chairs: Florent Heidet (ANL), Roberto Ponciroli (ANL)
Location: Seacliff B

3:00 pm
15716 SAS4A Analyses on SCARABEE in-Pile Experiments Assuming Hypothetical Total Instantaneous Flow Blockages in SFRs, Yoshitaka Fukano (JAEA)

3:20 pm
16417 SAS4A Analyses of CABRI In-Pile Experiments Simulating Unprotected-Loss-of-Flow Accidents in SFRs, Yuya Imaizumi, Yoshitaka Fukano (JAEA)

3:40 pm
16458 ASTRID: An Innovative Control Rod System to Manage Reactivity, B. Fontaine, P. Sciora, M. Vanier, C. Venard (CEA)

4:00 pm
16573 Analysis of High Burn-Up Annular Fuel Pin Behavior under a CABRI Transient Over Power with the SAS-SFR Code, Sara Perez-Martin, Werner Pfrang (KIT)

HTR THERMAL HYDRAULICS—II (JOINT WITH TRACK 7)

Co-chairs: Gerhard Strydom (ANL), Kun Chen (Shanghai Inst of Applied Physics)
Location: Seacliff C

3:00 pm
16667 PHISICS/RELAP5-3D Results for Exercises II-1 and II-2 of the OECD/NEA MHTGR-350 Benchmark, Gerhard Strydom (INL)

3:20 pm
16422 Analyses of the Natural Circulation in the TMSR-SF Primary Coolant System in a Loss of Forced Cooling Event, Kai Wang, Xiaowei Jiao, Zhaozhong He, Kun Chen (Chinese Academy of Sciences)

3:40 pm
16555 A Sensitivity Study of a Coupled Kinetics and Thermal-Hydraulics Model for Fluoride-Salt-Cooled, High-Temperature Reactor (FHR) Transient Analysis, Xin Wang, Kathryn D. Huff, Manuele Aufiero, Per F. Peterson, Massimiliano Fratoni (Univ of California, Berkeley)

4:00 pm
16592 Uncertainty Analysis of Transportable Fluoride-Salt-Cooled High-Temperature Reactor (TFHR) using DAKOTA Coupled with RELAP5-3D, Chenglong Wang (Xi'an Jiaotong Univ/MIT), Kaichao Sun, Lin-wen Hu (MIT), Suizheng Qiu, Guanghui Su (Xi'an Jiaotong Univ)

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TECHNICAL SESSIONS - 3:00-4:20 PM

TWO PHASE FLOW TH—I

Co-chairs: Haihua Zhao (INL), In Cheol Bang (UNIST)
Location: Seacliff D

3:00 pm
16337 Local Void Distribution of Subcooled Boiling Flow in Circular Tube Under Rolling Condition, Wei Bao, Bing de Chen, Jianjun Xu, Tianzhou Xie, Yanping Huang (Nuclear Power Inst of China)

3:20 pm
16469 Analysis of the Liquid Film Formed Beneath a Vapour Bubble Growing at a Heated Wall Without Neglect of Evaporative Thermal Resistance, Giovanni Giustini, Vittorio Badalassi, Simon P. Walker (Imperial College London)

3:40 pm
16574 Newton-Krylov Method in Applications of Solving Two-Phase Problems using Drift Flux Model, Ling Zou, Haihua Zhao, Hongbin Zhang (INL)

4:00 pm
16771 Optimization of Wall Friction Two-Phase Flow Multiplier in the Subchannel Code CTF using the BFBT Benchmark, A. Abarca, R. Miró, G. Verdú (UPV), A. Soler (Nfoque Advisory Solutions)

RADIATION AND THERMAL DEGRADATION OF MATERIALS—II

Co-chairs: Brian Wirth (Univ of Tennessee), Celine J. Cabet (CEA)
Location: Waterfront AB

3:00 pm
16624 Multiscale Modeling of Defect Cluster Evolution in Fe-Cr Based Alloys for Nuclear Cladding or Structural Materials Applications, B. D. Wirth (Univ of Tennessee/ORNL), X. Hu (ORNL), A. Kohnert, D. Xu (Univ of Tennessee)

3:20 pm
16432 Three-Dimensional Finite Element Analysis of Pilgering Process of Hybrid-Layer Cladding for Advanced Small Modular Fast Reactor Application, Jung Ki Lee, Jeonghyeon Lee, Ji Hyun Kim (UNIST), Yong-Hoon Shin Il Soon Hwang (Seoul Natl Univ), Ronald G. Ballinger (MIT)

3:40 pm
16531 Dislocation Climb, Precipitation Hardening and NewtonianViscous Deformation Mechanisms of High Temperature Creep in a Niobium-Modified Zircaloy, B. Kombaiah, K. L. Murty (NCSU)

4:00 pm
16663 Composition-Dependence of Stacking Fault Energy in Austenitic Stainless Steels Through Regression Analysis, G. Meric de Bellefon (Univ of Wisconsin, Madison), C. Domain (EDF R&D/UMET), J. C. van Duysen (EDF R&D/Univ of Tennessee/UMET), K. Sridharan (Univ of Wisconsin, Madison)

TECHNICAL SESSIONS - 10:20 AM-12:00 PM

FLEXIBLE GENERATION

Co-chairs: Piyush Sabharwall (INL), Bojan Petrovic (Georgia Tech)
Location: Grand Ballroom A

10:20 am
16045 Electricity Production using Nuclear Reactors with Topping Cycles to Compete with Low-Price Natural Gas and Subsidized Renewables, Charles Forsberg (MIT)

10:40 am
16634 The Clean Power Plan—Impact on the U.S. Nuclear Energy Industry and Analysis of Major Issues, Daniel Curtis (MIT), Nicholas Thompson (RPI)

11:00 am
16636 Sensitivity Studies of Thermal Energy Storage at Nuclear Plants Using ERCOT Grid, R. Morneau, E. Schneider, N. Mann (Univ of Texas, Austin), C. Forsberg (MIT), J. Parga, A. Lapotin (Univ of Texas, Austin)

11:20 am
16724 The Value of Load Following Capacity: Will Increasing Renewable Share in Europe's Electricity Reduce Nuclear Reactors' Capacity or Load Factors?, A. Bidaud, S, Mima, J. Després, D. Heueur, P. Criqui (Grenoble-Alpes Univ), B. Champel (CEA), N. Hadjsaid (Grenoble-Alpes Univ)

11:40 am
16806 Aquatic Availability Needs Analysis of Nuclear Power Scenarios for Electricity and Potable Water Production, Mariana Guerra Do Carmo, Pavel V. Tsvetkov (Texas A&M)

LWR SEVERE ACCIDENTS—I

Co-chairs: Edward D. Blandford (Univ of New Mexico), Toshihiro Aoyagii (JAPC)
Location: Golden Gate

10:20 am
16431 Analysis on the Severe Accident Progression for SBO Considering Operator Actions, Huong Thi Vo, JinHo Song,TaeWoon Kim, DongHa Kim (KAERI)

10:40 am
16441 Power Uprate Effect on Core Damage Frequency in a MBLOCA with Multiple Operator Actions, Y. M. Chen, M. Lee (Natl Tsing Hua Univ), S. K. Chen (Inst of Nuclear Energy Research (retired))

11:00 am
16478 An Investigation of Spray-Based Approach to Mitigate Severe Accident Consequences, Irfan Younus (KAIST), Thiphaine Medard (École des Mines de Saint Étienne), Man-Sung Yim (KAIST)

11:20 am
16697 Oxidation of Zircaloy-4 in Steam-Nitrogen Mixtures at 600-1200°C, Martin Steinbrueck, Mirco Grosse, Fabio Oliveira da Silva (KIT)

AR DESIGN STUDIES—II

Co-chairs: Pavel V. Tsvetkov (Texas A&M), Robert C. Petroski (TerraPower)
Location: Marina

10:20 am
16299 Enumeration of Static and Dynamic Neutron Consumption D-Factor for Several Selected Reactors at Equilibrium Closed Fuel Cycle, Jiří Křepel (Paul Scherrer Inst), Evžen Losa (Paul Scherrer Inst/Czech Technical Univ in Prague)

10:40 am
16632 Highly Reliable Nuclear Power for Mission-Critical Applications, J. Doyle, B. Haley, C. Fachiol, B. Galyean, D. T. Ingersoll (NuScale Power, LLC)

11:00 am
16798 High-Temperature Gas Reactor with Transuranic Fuels, F. Cardoso, A. Fortini, C. Pereira, A. L. Costa, M. A. F. Veloso, C. A. M. da Silva (UFMG/Inst Nacional de Ciencias e Technologia de Reatores Nucleares Inovadores/CNPq)

11:20 am
16805 Design Options for Ultra-Compact Nuclear Driven Power Sources for Field Applications, Dean A. Mathis, Pavel V. Tsvetkov (Texas A&M)

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TECHNICAL SESSIONS - 10:20 AM-12:00 PM

AR FUEL CYCLES—I

Co-chairs: Jeffrey Powers (ORNL), Emory Collins (ORNL)
Location: Seacliff A

10:20 am
16118 HCSMR Fuel Assembly Computations with APOLLO2 and TRIPOLI-4®, D.Janin, M. Seidl (E.ON Kernfraft GmBH), M. Soldevila, S. Douce, E. Brun, F. Damian, C. Poinot (CEA), R. Macian (Technical Univ of Munich)

10:40 am
16413 Seed and Blanket Core Fed with Low-Enriched Uranium, F. Heidet (ANL), P. M. Gorman (Univ of California, Berkeley), T. K. Kim (ANL)

11:00 am
16506 Feasibility of TRU-Burning Resource-Renewable Boiling Water Reactors (RBWR) with a Square Lattice, Phillip Gorman, Massimiliano Fratoni, Jasmina Vujic, Ehud Greenspan (Univ of California Berkeley)

11:20 am
16790 Neutronic Analysis of Reprocessed Fuel in a Gas-Cooled Fast Reactor, A. A. P. Macedo (Escola de Engenharia), Carlos E. Velasquez, C. A. M. da Silva, C. Pereira (UFMG/CNPQ)

METHODS FOR REACTOR ANALYSIS—I

Co-chairs: Massimiliano Fratoni (Univ of California, Berkeley), Radim Vocka (UJV Rez, a.s.)
Location: Seacliff B

10:20 am
16513 Lattice Code Choice Effect and Geometry and Material Uncertainties in Core Physics Calculations, Radim Vočka, Frantisek Havlůj,(ÚJV Řež)

10:40 am
16514 QUADRIGA—General and Powerful Lattice Code Calculation Framework, Radim Vočka Frantisek Havlůj, (ÚJVŘež)

11:00 am
16751 Application and Research of OpenMP Parallel Programming and Performance Optimization in MOC Module of COSINE Software Package, Chenglin Zhu, Shuo Li, Yuhang Yan, Yu Hui, Yixue Chen (SNPTC)

11:20 am
16765 Simplified Spherical Harmonics Equation in the High-Order Finite Element Method, A.Vidal-Ferràndiz, R. Fayez, G. Verdú, D. Ginestar (UPV)

HTR THERMAL HYDRAULICS—III (JOINT WITH TRACK 7)

Co-chairs: Hans Gougar (INL), Gerhard Strydom (INL)
Location: Seacliff C

10:20 am
16530 Current Status of Thermo-Fluid Experimental Research on VHTR in KAERI, Min-Hwan Kim, Chan-Soo Kim, Jong-Hwan Kim (KAERI)

10:40 am
15833 Experimental Study of DRACS Steady-State and Transient Performance, Qiuping Lv, Hsun-Chia Lin, Shanbin Shi, Xiaodong Sun, Richard Christensen, Thomas Blue (Ohio State), Graydon Yoder, Dane Wilson (ORNL), Piyush Sabharwall (INL)

11:00 am
16504 RELAP5 Model Validation and Benchmark for DRACS Thermal Performance, Hsun-Chia Lin, Qiuping Lv, Shanbin Shi, Xiaodong Sun, Richard Christensen, Thomas Blue (Ohio State), Piyush Sabharwall (INL)

11:20 am
16289 Fluid-Solid Coupling Analysis of Fusion-Fission Hybrid Reactor Subcritical Energy Blanket Based on ITER, Liu Zhiyong (CAEP), Liang Shangming (Sichuan Univ), Zeng Herong (CAEP)

11:40 am
16473 Sensitivity Study of Thermophysical Properties for LiF-BeF_2 and Simulant Oils on a Natural Circulation Loop with MARS Code Implementation, Yukyung Shin, Seok Bin Seo, In Guk Kim, In Cheol Bang (UNIST)

TECHNICAL SESSIONS - 10:20 AM-12:00 PM

TWO PHASE FLOW TH—II

Co-chairs: Matthew J. Memmott (Brigham Young Univ), In Cheol Bang (UNIST)
Location: Seacliff D

10:20 am
16376 Evaluation of Wall Friction Model in MARS-MultiD Module with Two-Dimensional Film Flow Experiments, Chi-Jin Choi, Jin-Hwa Yang, Hyoung Kyu Cho (Seoul Natl Univ), Dong-Jin Euh (KAERI), Goon-Cherl Park (Seoul Natl Univ)

10:40 am
16456 Testing of the KERENA Containment Cooling Condenser, A Passive Low Pressure Cooling System, Thomas Wagner (AREVA GmbH), Stephan Leyer (Univ of Luxembourg)

11:00 am
16510 Design of the I²S-LWR Steam Generation System using Multi-Objective Optimization Schemes, Paul R. Wilding, Matthew J. Memmott (Brigham Young Univ)

11:20 am
16612 Internal Dropwise Condensation Model for a Horizontal Pipe during Stratified Flow, Joo Won Kang, Kyoung Won Hwang, Hyun Sun Park, Kiyofumi Moriyama (POSTECH), Moo Hwan Kim (POSTECH/KINS)

11:40 am
16802 Experiment and Analysis of Mixing Process of Two Component Gases in a Vertical Fluid Layer, Tetsuaki Takeda, Shumpei Funatani (Univ of Yamanashi)

TECHNICAL SESSIONS - 1:00-2:40 PM

POWER CONVERSION AND STORAGE

Co-chairs: Charles W. Forsberg (MIT), Matthew Memmott (Brigham Young Univ)
Location: Grand Ballroom A

1:00 pm
16046 Technologies to Fully Utilize Wind, Solar and Nuclear Capacity to Minimize Total Costs in Low-Carbon Electricity Grids, Charles Forsberg (MIT)

1:20 pm
16512 Preliminary Design of a Thermal Storage System for a Light Water Reactor, Richard L. Fitzhugh, James D. Richards, Jared M. Schaumann, Matthew J. Memmott (Brigham Young Univ)

1:40 pm
16620 An Efficient Thermo-Photovoltaic Generator for Use with High-Temperature Nuclear Sources, Gregg Scranton, T. Patrick Xiao, John Holzrichter, Per Peterson, Eli Yablonovitch (Univ of California, Berkeley)

2:00 pm
16622 Conceptual Design and Market Assessment of Firebrick Resistance Heated Energy Storage (FIRES)—Avoiding Wind and Solar Electricity Price Collapse to Improve Nuclear, Wind, and Solar Economics, Daniel C. Stack, Daniel Curtis, Richard Ibekwe, Charles Forsberg (MIT)

2:20 pm
16434 Investigation of Converting Spent Fuel Radiation into Electricity, Haneol Lee, Man-Sung Yim (KAIST)

LWR SEVERE ACCIDENTS—II

Co-chairs: Edward D. Blandford (Univ of New Mexico), Toshihiro Aoyagii (JAPC)
Location: Golden Gate

1:00 pm
16452 Experimental Study of the Boron and Air Effects on Iodine Transport in the Primary Circuit during Severe Nuclear Accident, Melany Gouëllo, Jouni Hokkinen, Teemu Kärkela, Ari Auvinen (VTT Technical Research Centre of Finland Ltd.)

1:20 pm
16453 Experimental Study on Filtration of Iodine with a Wet Electrostatic Precipitator, Jouni Hokkinen, Mélany Gouëllo, Teemu Kärkela, Ari Auvinen (VTT Technical Research Centre of Finland)

1:40 pm
16563 Analysis of Kinetic Behaviors of Aqueous Electron and Hydroxyl Radicals in Water Radiolysis using the Computational Model, Ayeong Kim, Han-Chul Kim, Inhee Choi, Jongseong Lee (KINS)

2:00 pm
16758 Containment Sump Strainer Performance and Downstream Effect Comprehensive Test Research of Qin Shan Phase II Extension Nuclear Power Plant, Tao Wang, WanYu Xiong, HaiJiang Zhao (Nuclear Power Inst of China), Luke Bockewitz, Rebert Choromokos (Anatech Corp), XianGuo Si, Xianrui Meng (Qinshan Nuclear Power Co.), Bernardo Figueiredo (Transco Products, Inc)

Technical Sessions: Tuesday April 19

TECHNICAL SESSIONS - 1:00-2:40 PM

MOLTEN SALT REACTOR TECHNOLOGY

Co-chairs: Nicholas R. Brown (ORNL), Kun Chen (Shanghai Inst of Applied Physics)
Location: Marina

1:00 pm
17181 Summary of the Workshop on Molten Salt Reactor Technologies Commemorating the 50th Anniversary of the Startup of the Molten Salt Reactor Experiment, M. Scott Greenwood, Nicholas R. Brown, Benjamin R. Betzler, Gary T Mays (ORNL)

1:20 pm
16423 Leak Frequency Analysis of the Primary Coolant for the Molten Salt Reactor, Qun Yang, Zhaozhong He, Shiwei Shao, Kun Chen (China Academy of Sciences)

1:40 pm
16124 Operation Control of Molten Salt U-Pu Fast Breeder Reactor, Yasuo Hirose, Koshi Mitachi, (Retired) Yoichiro Shimazu (Univ of Fukui)

AR FUEL CYCLES—II

Co-chairs: Jeffrey Powers (ORNL), Anton Moisseytsev (ANL)
Location: Seacliff A

1:00 pm
16628 Improved Utilization of Thorium in SFR Cores without Thorium Recycling, Guanheng Zhang (ANL), Massimiliano Fratoni, Ehud Greenspan (Univ of California, Berkeley)

1:20 pm
16830 The EQLOD Procedure for Fuel Cycle Studies in Molten Salt Reactors, Boris Hombourger (Paul Scherrer Inst/Ecole Polytechnique Federale de Lausanne), Krepel Jiri, Konstantin Mikityuki (Paul Scherrer Inst), Andreas Pautz (Paul Scherrer Inst/Ecole Polytechnique Federale de Lausanne)

1:40 pm
17180 Core Design Characteristics of the Fluoride Salt-Cooled High Temperature Demonstration Reactor, N. R. Brown, A. L. Qualls, B. R. Betzler, J. J. Carbajo, M. S. Greenwood, R. Hale, T. J. Harrison, J. J. Powers, K. R. Robb (ORNL)

METHODS FOR REACTOR ANALYSIS—II

Co-chairs: Pavel Tzvetkov (Texas A&M), Dingkang Zhang (Georgia Tech)
Location: Seacliff B

1:00 pm
16025 Uncertainty Analysis of Fuel Lattice Physics using CASMO-4 with JENDL-4.0 Covariance Data, Shigeki Shiba, Tomohiro Sakai (S/NRA/R)

1:20 pm
16360 Continuous Energy Function Sensitivity Calculation Using GPT in Monte Carlo Neutron Transport: Application to Resonance Parameters Sensitivity Study, Aufiero Manuele (Univ of California, Berkeley), Adrien Bidaud, Massimiliano Fratoni (Univ Grenoble Alpes)

1:40 pm
16402 Comparison of the Point-Kinetics and Quasi-Static Methods with SIMMER-III—Application to a ULOF Calculation, S. Poumérouly, D. Lemasson, E. Girardi (EdF R&D)

TECHNICAL SESSIONS - 1:00-2:40 PM

TH CODE ADVANCES—I

Co-chairs: David L. Aumiller (BMPC- Bettis), Ling Zou (INL)
Location: Seacliff C

1:00 pm
16428 Characteristics of the Steam Injector for the Static Reactor Cooling Systems, Hiroto Endo, Shuichiro Miwa, Michitsuga Mori (Hokkaido Univ)

1:20 pm
16527 Developing A Fully Implicit Compressible Flow Valve Model in RELAP-7 and Its Application in Short Term BWR Station Black-Out Analyses, Haihua Zhao, Ling Zou, Hongbin Zhang (INL)

1:40 pm
16576 Early-Demonstration of BEPU Analysis with the RELAP5-3D Code in Response to Proposed 10 CFR 50.46(c) Rulemaking, Hongbin Zhang, Ronaldo Szilard, Paul Bayless, Ling Zou, Haihua Zhao (INL)

2:00 pm
16875 GPASS—A Code for Design and Analysis of Power Plant Control and Protection Systems, Richard B. Vilim, Taeseung Lee, Stefano Passerini (ANL)

2:20 pm
17447 Modeling and Simulation of an Operational VVER-1000 Benchmark with NESTLE, N. P. Luciano, P. E. Collins, G. I. Maldonado (Univ of Tennessee), I. Gauld (ORNL)

POROUS MEDIA THERMAL HYDRAULICS

Co-chairs: Shripad T. Revankar (Purdue Univ), Michael Laufer (Univ of California, Berkeley)
Location: Seacliff D

1:00 pm
16308 Particle Morphology Effect on Frictional Pressure Drops of Single-Phase Water/Air in the Single-Size Particle Beds for Ex-Vessel Coolability, Jin Ho Park, Mooneon Lee, Eunho Kim, Hyun Sun Park (POSTECH)

1:20 pm
16370 Three-Dimensional Analysis on the Coolability of Inhomogeneous Debris Bed with the Code MEWA 3D, Ana Hartmann, Michael Buck, Jörg Starflinger (Univ of Stuttgart)

1:40 pm
16383 Effect of Particle Shape on Pressure Gradients of Water/Air Two-Phase Flow in the Particulate Beds for Ex-Vessel Coolability, Jin Ho Park, Mooneon Lee, Eunho Kim, Hyun Sun Park (POSTECH)

2:00 pm
16770 Study on Single Phase Flow and Convection Heat Transfer in Porous Medium with Internal Heat Source, Dawei Zhao, Zhen Zhang, Xiao Yan, Zejun Xiao (Nuclear Power Inst of China)

ADVANCED MATERIALS TECHNOLOGIES

Co-chairs: Kurt Edsinger (EPRI), Kumar Sridharan (Univ of Wisconsin, Madison)
Location: Waterfront AB

1:00 pm
16575 Characterization of SiC-SiC Composites for Application in Current and Advanced Reactors, J. Kabel, M. Balooch, D. Frazer (Univ of California, Berkeley), C. Deck (General Atomics), T. Koyanagi, K. Terrani (ORNL), P. Hosemann (Univ of California, Berkeley)

1:20 pm
16664 Investigation of Tailored SiC/SiC Composites for Sodium-Cooled Fast Reactors, J. Braun, C. Sauder, F. Balbaud-Célérier, F. Rouillard, C. Guéneau (CEA)

1:40 pm
15829 Effect of Shot Peening on Oxidation Resistance of Austenitic Alloys in Supercritical Water Conditions, Sami Penttil, Aki Toivonen, Pertti Auerkari, Jarkko Metsajoki (VTT Technical Research Centre of Finland Ltd.)

2:00 pm
16375 Adaption of Crack Growth Detection Techniques to U.S. Material Test reactors, A. Joseph Palmer, Sebastien P. Teysseyre, Kurt L. Davis (INL), Gordon Kohse, Yakov Ostrovsky, David M. Carpenter (MIT), Joy L. Rempe (Rempe & Assoc)

2:20 pm
16602 Development of an Integrated Kinetic Model for Quantitative Predictions of Corrosion Rates and Irradiation Induced Hardening in Zr-Alloy Clad, Asghar Aryanfar, Jaime Marian (UCLA)

Technical Sessions: Tuesday April 19

TECHNICAL SESSIONS - 3:00-4:20 PM

ADVANCED REACTOR ECONOMICS

Co-chairs: Andrew G. Sowder (EPRI), Charles Forsberg (MIT)
Location: Grand Ballroom A

3:00 pm
16544 Total Capital Investment Cost Evaluation of SMR Modular Construction Designs, Giovanni Maronati, Bojan Petrovic, James W. Banner, Chelsea C. White III (Georgia Tech), Matthew H. Kelley, Jurie van Wyk (Westinghouse), James W. Banner (Georgia Tech)

3:20 pm
16722 A Model for Assessing FHR Fuel Fabrication and Fuel Cycle Cost, Christopher Kingsbury, Bojan Petrovic (Georgia Tech)

3:40 pm
16829 Reactor Capital Costs Breakdown and Statistical Analysis of Historical U.S. Construction Costs, F. Ganda (ANL), J. Hansen (INL), T. K. Kim, T. A. Taiwo (ANL), R. Wigeland (INL)

4:00 pm
16966 Expanding the Concept of Flexibility for Evaluating Advanced Nuclear Energy Systems as Future Commercial Options, Andrew Sowder (EPRI), Bethany Burkhardt, Steve Krahn (Vanderbilt Univ), Nick Irvin (Southern Company Services)

LWR SEVERE ACCIDENTS—III

Co-chairs: Mirco Karl Grosse (KIT), Jean Barbaud (EdF)
Location: Golden Gate

3:00 pm
16391 A Corium Research Platform for the Resolution of Severe Accident Issues, Jin Ho Song, Hwan Yeol Kim, Seong Wan Hong (KAERI)

3:20 pm
16490 Preliminary Investigations of Vortex Based Ex-Containment Safety System for Severe Accident Management at NPPs, Sana Ullah, Man-Sung Yim, Jinsoo Park, Hyung Jin Sung (KAIST)

3:40 pm
16586 Development of a Computational Model for Severe Accident Simulation in Next Generation PWRs, Dong H. Kim, Jun H. Bae (KAERI), Raf M. Podowski, Michael Z. Podowski (Podowski Eng Consulting)

4:00 pm
16364 Development of Radiological Consequence Assessment and Prognosis Tool for Emergency Response to Nuclear Accidents in Northeast Asia, Juyoul Kim, Seunghee Lee, Juyub Kim, Sukhoon Kim, Taebin Yoon (FNC Technol), Li-Chi Cliff Po (Micro-Simulation Technology)

AR SIMULATION UNCERTAINTY QUANTIFICATION

Co-chairs: Thomas H. Fanning (ANL), Fabrice Fouet (IRSN)
Location: Marina

3:00 pm
16387 Lessons Learned for Nuclear Safety Studies from the Quantification of Input Parameters Uncertainties Applied to CATHARE Thermal-Hydraulics Code within the Premium Benchmark, Fabrice Fouet, Pierre Probst (IRSN)

3:20 pm
16419 Uncertainty Quantification of Physical Models and Extrapolation of Uncertainties during LBLOCA, Deog Yeon Oh, Kwang Won Seul, Young Seok Bang, Tae Suk Hwang (KINS)

3:40 pm
16485 Uncertainty Quantification in Advanced Reactors: The Coupling of SAS4A/SASSYS-1 with RAVEN and Dakota, Acacia J. Brunett, Thomas H. Fanning (ANL)

4:00 pm
16780 CFD Numerical Simulation and Research on 3D Flow Field and Temperature Field of Sodium Pool of Traveling Wave Reactor, Xu Xie (NPIC)

TECHNICAL SESSIONS - 3:00-4:20 PM

AR FLUID/STRUCTURES RESPONSE

Co-chairs: Michael Laufer (Univ of California, Berkeley), Christian H. Latge (CEA)
Location: Seacliff A

3:00 pm
16317 Flow-Induced Vibration Evaluation of Primary Hot-Leg Piping in Advanced Loop-Type Sodium-Cooled Fast Reactor for Demonstration, Hidemasa Yamano (JAEA), Yang Xu (Mitsubishi FBR Systems, Inc.), Hiromi Sago, Kazuo Hirota, Takeo Baba (Mitsubishi Heavy Industries, Ltd.)

3:20 pm
16440 Study on Reduction of Vertical Seismic Response for Sodium-Cooled Fast Reactor Building, Tomohiko Yamamoto, Nobuchika Kawasaki, Nobuyuki Ishikawa, Yoshitaka Chikazawa (JAEA), Tsuyoshi Fukasawa, Shigeki Okamura (Mitsubishi FBR Systems, Inc.), Takahiro Somaki (Obayashi Cooperation)

FUEL CYCLE MODELING

Co-chairs: Jeffrey Powers (ORNL), Bo Feng (ANL)
Location: Seacliff B

3:00 pm
16397 The Impact of Reactor Model Simplification for Fuel Evolution: A Bias Quantification for Fuel Cycle Dynamic Simulations, Alice Somaini, Sylvain David, Xavier Doligez, Abdoul-Aziz Zakari-Issoufou (IPN Orsay), Adrien Bidaud, Nicholas Cappelan, Olivier Meplan, Alexis Nuttin, Pierre Prevot (LPSC), Funny Courtin, Baptiste Leniau, Baptiste Mouginot, Nicolas Thiolliere (Subatech)

3:20 pm
16403 Review of Four Decades Dedicated to Spent Fuel Analyses in France: An Incomparable Database Built for Codes Validation, Stephane Cathalau, Jean-François Lebrat, Laurence San Felice, Benedicte Roque (CEA), Matthieu Guillo (EdF), Pierre-Marie Demy (AREVA)

3:40 pm
16464 Verification of the Depletion Calculation Scheme of an Highly Heterogenous PWR Core Design, S. Mengelle, S. Douce, F. Damian (CEA)

4:00 pm
16481 SFR Minor Actinide Bearing Blanket Fine Characterization Using Monte-Carlo, Laurent Buiron, Bruno Fontaine (CEA)

TH CODE ADVANCES—II

Co-chairs: Igor A. Bolotnov (NCSU), Piyush Sabharwall (INL)
Location: Seacliff C

3:00 pm
15814 An Analytical Methodology to Evaluate Thermal-Hydraulic Performance of Compact Heat Exchangers, Accounting for Heat Loss, Su-Jong Yoon (INL), Kevin Wegman (Ohio State), James E. O'Brien, Piyush Sabharwall (INL), Xiaodong Sun (Ohio State)

3:20 pm
16321 Preliminary Analysis of Flow Maldistribution in ASTRID Sodium-Gas Heat Exchanger, C. Galati, X. Jeanningros, L. Cachon (CEA), L. Prat, Ch. Gourdon (IENSIACET)

3:40 pm
16536 Computer Modeling and Experimental Validation for Coiled-Tube Gas Heaters, Andrew Greenop, Per F. Peterson (Univ of California, Berkeley)

Technical Sessions: Tuesday April 19

TECHNICAL SESSIONS - 3:00-4:20 PM

INSTRUMENTATION

Co-chairs: Vivek Agarwal (INL), Donald Grove (Excelsior College)
Location: Seacilff D

3:00 pm
16378 Ex-Core Detector Response Evaluation of Kori 1 Reactor using MCNP6 Adjoint Calculation, Youqi Zheng (Xi'an Jiaotong Univ/UNIST), Deokjung Lee, Peng Zhang (UNIST), Eunki Lee, Ho-Cheol Shin (KHNP)

3:20 pm
16449 Optimization of Boron Meter Model, Chidong Kong, Hyunsuk Lee (UNIST), Si Hwan Kim, Seakjean Lyou (Users Inc.), Deokjung Lee (UNIST)

3:40 pm
16495 Electrical Calculation Code RELECS in CSS "VEB" for NPP Designs, Evgeny P. Obraztcov, Andrey N. Belikov (JSC ATOMPROEKT), Nikolay N. Menshikov, Evgeny N. Popkov (St. Petersburg Polytechnic Univ)

4:00 pm
16744 Self-Powered Wireless Sensor Node Power Modeling Based on IEEE 802.11 Communication Protocol, Vivek Agarwal (INL), Raymond A. DeCarlo, Lefteri H. Tsoukalas (Purdue Univ)

SEISMIC SAFETY

Co-chairs: Richard S. Denning (Ohio State), Matthew R. Denman (SNL)
Location: Waterfront AB

3:00 pm
16492 Assessing the Conservatism of the Separation of Variables Approach to Seismic Probabilistic Risk Assessment, Jieun Hur, Askin Guler, Halil Sezen, Tunc Aldemir (Ohio State), Richard Denning (Consultant)

3:20 pm
16496 A Dynamic Treatment of Common Cause Failure in Seismic Events, Askin Guler, Jieun Hur, Zachary Jankovsky, Halil Sezen, Tunc Aldemir (Ohio State), Richard Denning (Consultant)

3:40 pm
16498 Computational Simulation of Dynamic Response and Failure of Structures in Seismic Events, Salome Uwizerimana, Metin Kose, Jieun Hur, Halil Sezen (Ohio State), Richard Denning (Consultant), Tunc Aldemir (Ohio State)

TECHNICAL SESSIONS - 4:20-6:00 PM

PRA

Co-chairs: Matthew R. Denman (SNL), Richard S. Denning (Ohio State)
Location: Grand Ballroom A

4:20 pm
15979 Loss of Coolant Accident Analysis with Consideration of Aging Effects, A. Guler, T. Aldemir (Ohio State), R. Denning (Consultant)

4:40 pm
16162 Recent Research Activities using NSRR on Safety Related Issues, Yutaka Udagawa, Tomoyuki Sugiyama, Masaki Amaya (JAEA)

5:00 pm
16794 Improved Sampling Algorithms in the Risk-Informed Safety Applications, D. Mandelli, A. Alfonsi, C. Smith, C. Rabiti, J. Cogliati (INL)

5:20 pm
16803 An Evaluation Method of Impact Load from Waterborn Debris, Gaku Nakamura, Yukihiko Okuda, Hiroaki Kawabata, Masakazu Jimbo (Toshiba), Hiroshi Niwa (Toshiba Nuclear Engineering Services Corp.)

TECHNICAL SESSIONS - 4:20-6:00 PM

LWR SEVERE ACCIDENTS—IV

Co-chairs: Micro Karl Grosse (KIT), Jean Barbaud (EdF)
Location: Golden Gate

4:20 pm
16451 Development of Correlation of Critical Heat Flux Measurement during In-Vessel Retention, Kazuyoshi Aoki, Chikako Iwaki, Hisaki Sato, Yasunobu Fujiki (Toshiba), Daisuke Kanamori (The Kansai Electric Power Co., Inc.)

4:40 pm
16388 Vessel Failure Models and Timing using MAAP5 for CPR1000, Zichen Zhao (City Univ of Hong Kong), Min Lee (National Tsing Hua Univ), Ting-Hsuan Chen (Univ of Hong Kong/National Tsing Hua Univ) John Kin Lim Ho, Ching-Chang Chieng (City Univ of Hong Kong)

5:00 pm
16448 Ex-Vessel Debris Bed Formation and Coolability—Challenges and Chances for Severe Accident Mitigation, M. Buck, G. Pohlner (Univ of Stuttgart)

AR PASSIVE SAFETY

Co-chairs: Florent Heidet (ANL), Richard B. Vilim (ANL)
Location: Marina

4:20 pm
16332 Definition of a Robust Supervisory Control Scheme for Sodium-Cooled Fast Reactors, R. Ponciroli, S. Passerini, R. B. Vilim (ANL)

4:40 pm
16511 The Use of a Passive Endothermic Reactor Cooling System for LWR Emergency Cooling, Joel Johnson, Aaron Bush, Nicholas Lewis, Benjamin Olvera, Trevor Lillywhite, Mike Malm, Abner Apsley, Matthew J. Memmott (Brigham Young Univ)

5:00 pm
16814 Novel Passive Safety Devices for a Sodium-Cooled Fast Reactor: FAST and SAFE, Chihyung Kim, In Hyung Kim, Donny Hartanto, Yonghee Kim (KAIST)

5:20 pm
16044 New Reactor Cavity Cooling System with a Novel Shape and Passive Safety Features, Kuniyoshi Takamatsu (JAEA), Tatsuya Matsumoto, Koji Morita (Kyushu Univ)

LIQUID METAL/MOLTEN SALT TH—I

Co-chairs: Mark H. Anderson (Univ of Wisconsin, Madison), Richard B. Vilim (ANL)
Location: Seacliff A

4:20 pm
15830 Thermo-Hydraulic Investigation of a Vertical Rectangular Duct with Liquid Metal Flow by Means of System Code and CFD Code Predictions, Wadim Jaeger, Florian Trimborn, Wolfgang Hering, Balazs Pritz, Martin Gabi (KIT)

4:40 pm
16594 Dynamical System Scaling of Integral Natural Circulation Experiments for Fluoride-Salt Cooled Reactors, A. J. Novak, N. Zweibaum, J. Anderson, P. F. Peterson (Univ of California, Berkeley)

5:00 pm
16596 Experimental and Computational Study of Fluoride Salt Mixture Solidification, Louis J. Chapdelaine, Kazi K. Ahmed, Mohammed A. Dbai, Raluca O. Scarlat (Univ of Wisconsin, Madison)

5:20 pm
16661 Literature Survey and Overview of the University of Wisconsin Molten Salt Flow Loop, K. Britsch, M. Anderson, T. Chrobak, K. Sridharan (Univ of Wisconsin, Madison)

5:40 pm
16271 Experimental Activities at KALLA on Heavy-Liquid Metal Heat Transfer for Fast Reactors, Th. Wetzel, M. Daubner, F. Fellmoser, K. Litfin, L. Marocco, J. Pacio (KIT)

Technical Sessions: Tuesday April 19

TECHNICAL SESSIONS - 4:20-6:00 PM

ADVANCED REACTOR POWER CONVERSION

Co-chairs: Anton Moisseytsev (ANL) Harry Andreades (Univ of California, Berkeley)
Location: Seacliff B

4:20 pm
16442 Status of Studies on ASTRID Gas Power Conversion System Option, David Plancq, Guy Laffont, Lionel Cachon, Olivier Gastaldi (CEA), Johann Quenaut (GE Power), Dan Roberson (Rolls-Royce)

4:40 pm
16491 Transient Load Following and Control Analysis of Advanced S-CO_2 Power Conversion with Dry Air Cooling, Anton Moisseytsev, James J. Sienicki (ANL)

5:00 pm
16876 Dynamic Stability of the S-CO_2 Energy Conversion Cycle as Affected by Sensor Response Time, Richard B. Vilim, Alexander Heifetz (ANL)

TH CODE ADVANCES—III

Co-chairs: Koroush Shirvan (MIT), Jake Yang (GE-H)
Location: Seacliff C

4:20 pm
16565 Dryout Power Characteristics of an Advanced CANDU Fuel Bundle, J. H. Park, Y. M. Song (KAERI)

4:40 pm
16340 Investigation on the Thermal-Hydraulic Characteristic and Mixing Effect of Pressurized Thermal Shock for a T-Junction Piping System, Chih-Yu Chang, Chih-Hung Lin, Yuh-Ming Ferng (National Tsing Hua Univ)

5:00 pm
16480 Development of Detailed RELAP/SCDAPSIM/MOD3.6 Input Models and User Guidelines for the Analysis of a CANDU Core during Core Uncovery Scenarios, Roxana-Mihaela Nistor-Vlad (Politehnica Univ of Bucharest), Chris M. Allison, Judith K. Hohorst (Innovative Systems Software)

5:20 pm
16518 Simulation of Emergency Depressurization Injection and Venting of Lungmen Nuclear Power Station using RELAP5 and MAAP5 Code, Y. S. Wang, F. L. Tsai, Min Lee (Natl Tsing Hua Univ)

IN SERVICE INSPECTION

Co-chairs: Nicholas Hernandez (Duke Energy), Richard F. Wright (Westinghouse)
Location: Seacliff D

4:20 pm
16380 Quantitative Analysis of the SNF Storage Cask by Means of Ultrasonic Testing, Y. Salchak, D. Sednev, S. Sharavina, T. Tverdokhlebova, A. Lider (Tomsk Polytechnic Univ)

4:40 pm
I6522 Important Parameters to Take into Account to Get Reliable Structural Materials Data for 60 Year Design Duration, Martine Blat-Yrieix, Frédéric Delabrouille (EdF R&D), Michel Blanc (CEA)

5:00 pm
16660 The Many Advantages of Elevated Power Turbine Valve Movement Testing, Nicolas Walter Hernandez (Duke Energy)

5:20 pm
16748 Fast 3D Point Clouds Alignment and Efficient Laser Scanning Positions Estimation using Dense Estimation, Yuji Kawaguchi, Yoshinori Satoh, Shohei Matsumoto, Tetsuo Endoh, Makoto Hatakeyama (Toshiba)

5:40 pm
16813 The Research of RPV Stud Holes Inspection Equipment Based on Array Image Acquisition, Ren He, Tan Hongwei, Weng Songfeng (Nuclear Power Inst of China)

TECHNICAL SESSIONS - 4:20-6:00 PM

SURFACE PHENOMENA IN REACTOR MATERIALS

Chair: Kumar Sridharan (Univ of Wisconsin, Madison) Co-chair: Kurt Edsinger (EPRI)
Location: Waterfront AB

4:20 pm
16302 In Situ Investigation of Pre-Transition Oxide Films on Zirconium Alloy in Simulated Primary Water Condition, Taeho Kim, Kyoung Joon Choi, Seung Chang Yoo, Ji Hyun Kim (UNIST)

4:40 pm
16354 Sodium Corrosion and Erosion of FM Cladding Material for TWR, Cheng Xu (TerraPower), Mark Anderson (Univ of Wisconsin, Madison)

5:00 pm
16493 Modeling of Emissivity of Materials for High Temperature Gas Reactor Applications, J. L. King, H. Jo, R. Bisson, K. Blomstrand (Univ of Wisconsin, Madison), S. K. Loyalka, R. V. Tompson (Univ of Missouri- Columbia), K. Sridharan (Univ of Wisconsin, Madison)

5:20 pm
16557 Development of a Sodium Tribology Program at TerraPower, Greg Vetterick (TerraPower)

5:40 pm
16705 Development on Applying Phase Diagram to Evaluation Method of Refractory Layer Erosion for Passive Debris Cooling System —Fundamental Study of UO_2-ZrO_2-Al_2O_3 Phase Diagram, Yuya Takahashi, Tomohisa Kuriita, Satoru Kuboya, Isao Sakaki (Toshiba), Tadashi Fujii (Hatachi-GE), Takafimi Tsuji (Chubu Electric Power Co., Inc.)

5:30-7:00 PM

STUDENT POSTER SESSION

Location: Grand Ballroom Foyer

16302 In Situ Investigation of Pre-Transition Oxide Films on Zirconium Alloy in Simulated Primary Water Condition, Taeho Kim, Kyoung Joon Choi, Seung Chang Yoo, Ji Hyun Kim (UNIST)

16490 Preliminary Investigations of Vortex Based Ex-Containment Safety System for Severe Accident Management at NPPs, Sana Ullah, Man-Sung Yim, Jinsoo Park, Hyung Jin Sung (KAIST)

16358 Lattice Design and Coolant Selection for a 333 MWth PWR Civil Marine Propulsion Core using Thorium-Based Checkerboard Micro-Heterogeneous Fuel, Syed Bahauddin Alam, Hassan Mohamed, Benjamin A. Lindley, Geoffrey T. Parks (Univ of Cambridge)

16538 Electronic Work Packages (eWP) Improving Maintenance Productivity, Donald L. Grove, Sr. (Excelsior College)

16418 A Study of BWR Mark I Station Blackout Accident with GOTHIC Modeling, Han Bao, Nam T. Dinh, Olumuyiwa Omotowa (NCSU), Haihua Zhao, Hongbin Zhang, Ling Zou, Ronaldo H. Szilard (INL)

16308 Particle Morphology Effect on Frictional Pressure Drops of Single-Phase Water/Air in the Single-Size Particle Beds for Ex-Vessel Coolability, Jin Ho Park, Mooneon Lee, Eunho Kim, Hyun Sun Park (POSTECH)

16321 Preliminary Analysis of Flow Maldistribution in ASTRID Sodium-Gas Heat Exchanger, C. Galati (CEA), X. Jeanningros, L. Cachon (French Alternative Energies and Atomic Energy Commission), L. Prat, Ch. Gourdon (IENSIACET)

Technical Sessions: Tuesday April 19

5:30-7:00 PM

STUDENT POSTER SESSION

Location: Grand Ballroom Foyer

16356 Theoretical Investigation of Spent Nuclear Fuel Monitoring using Cosmic Ray Muons, S. Chatzidakis, L. H. Tsoukalas (Purdue Univ)

16931 Water Distribution in a Nordic BWR Containment during a LOCA, Ignacio Gallego-Marcos, Walter Villanueva, Pavel Kudinov (KTH)

16279 High Temperature Oxidation Behavior of Kanthal APM and D Alloys in Steam, Chongchong Tang, Martin Steinbrueck, Mirco Grosse, Adrian Jianu, Alfons Weisenburger, Hans Juergen Seifert (KIT)

16397 The Impact of Reactor Model Simplification for Fuel Evolution: A Bias Quantification for Fuel Cycle Dynamic Simulations, Alice Somaini, Sylvain David, Xavier Doligez, Abdoul-Aziz Zakari-Issoufou (IPN Orsay), Adrien Bidaud, Nicholas Cappelan, Olivier Meplan, Alexis Nuttin, Pierre Prevot (LPSC), Funny Courtin, Baptiste Leniau, Baptiste Mouginot, Nicolas Thiolliere (Subatech)

16809 On the Question of Decay Heat Removal System Redundancy for Fluoride Salt-Cooled High-Temperature Reactors (FHR), Joel Hughes, Maolong Liu, Bryan Wallace, Amir F. Ali (Univ of New Mexico), Michael Laufer (Univ of California, Berkeley), Matthew R. Denman (SNL), Nicolas Zweibaum, Per Peterson (Univ of California, Berkeley), Edward D. Blandford (Univ of New Mexico)

16478 An Investigation of Spray-Based Approach to Mitigate Severe Accident Consequences, Irfan Younus (KAIST), Thiphaine Medard (École des Mines de Saint Étienne), Man-Sung Yim (KAIST)

16555 A Sensitivity Study of a Coupled Kinetics and Thermal-Hydraulics Model for Fluoride-Salt-Cooled, High-Temperature Reactor (FHR) Transient Analysis, Xin Wang, Kathryn D. Huff, Manuele Aufiero, Per F. Peterson, Massimiliano Fratoni (Univ of California, Berkeley)

16830 The EQLOD Procedure for Fuel Cycle Studies in Molten Salt Reactors, Boris Hombourger (Paul Scherrer Inst/Ecole Polytechnique Federale de Lausanne), Krepel Jiri, Konstantin Mikityuki (Paul Scherrer Inst), Andreas Pautz (Paul Scherrer Inst/Ecole Polytechnique Federale de Lausanne)

16350 Identification and Early Warning for NPP Accidents, Jian-Lun Huang, Hwai-Pwu Chou (Natl Tsing Hua Univ)

16445 Scaling of the Chinese HTR-PM Reactor Design for Licensing and Testing at the Oregon State University High Temperature Test Facility, Jordan Cox, Brian Woods (Oregon State Univ)

16352 Accident Management Based on Computerized Emergency Operating Procedures, Yen Chun Chiu, Hwai-Pwu Chou (Natl Tsing Hua Univ)

5:30-7:00 PM

STUDENT POSTER SESSION

Location: Grand Ballroom Foyer

16663 Composition-Dependence of Stacking Fault Energy in Austenitic Stainless Steels Through Regression Analysis, G. Meric de Bellefon (Univof Wisconsin, Madison), C. Domain (EDF R&D/UMET), J. C. van Duysen (EDF R&D/Univ of Tennessee/UMET), K. Sridharan (Univ of Wisconsin, Madison)

16496 A Dynamic Treatment of Common Cause Failure in Seismic Events, Askin Guler, Jieun Hur, Zachary Jankovsky, Halil Sezen, Tunc Aldemir (Ohio State), Richard Denning (Consultant)

16388 Vessel Failure Models and Timing using MAAP5 for CPR1000, Zichen Zhao (City Univ of Hong Kong), Min Lee (National Tsing Hua Univ), Ting-Hsuan Chen, John Kin Lim Ho, Ching-Chang Chieng (City Univ of Hong Kong)

15979 Loss of Coolant Accident Analysis with Consideration of Aging Effects, A. Guler, T. Aldemir (Ohio State), R. Denning (Consultant)

16376 Evaluation of Wall Friction Model in MARS-MultiD Module with Two-Dimensional Film Flow Experiments, Chi-Jin Choi, Jin-Hwa Yang, Hyoung Kyu Cho (Seoul Natl Univ), Dong-Jin Euh (KAERI), Goon-Cherl Park (Seoul Natl Univ)

16622 Conceptual Design and Market Assessment of Firebrick Resistance Heated Energy Storage (FIRES)—Avoiding Wind and Solar Electricity Price Collapse to Improve Nuclear, Wind, and Solar Economics, Daniel C. Stack, Daniel Curtis, Richard Ibekwe, Charles Forsberg (MIT)

Technical Sessions: Wednesday April 20

TECHNICAL SESSIONS - 10:00 AM-12:00 PM

LWR CORE DESIGN—I (JOINT WITH TRACK 1)

Co-chairs: Shiro Takahashi (HItachi, Ltd.), Frederic Damian (CEA)
Location: Golden Gate

10:00 am
16294 New Developments in Core Loading Optimization, Jonatan Hejzlar, Michal Kvasnicka (ÚJV Řež a.s.)

10:20 am
16521 ESBWR Fuel in the Certified Design and Considerations for Increased Margins, Md Alamgir, Wayne Marquino (GE Hitachi Nuclear), Greg Pearson (Global Nuclear Fuel-Americas), Ken Karcher, Jake Yang, Curtis Branter (GE Hitachi Nuclear)

10:40 am
16549 Comparative Study of CASMO-5/SIMULATE-5 and nTRACER for EPR Core Analyses, S. Canepa, H. Ferroukhi (Paul Scherrer Inst), R. Min, H. G. Joo (Seoul National Univ)

11:00 am
16755 A Multi-Physics PWR Model for the Load Following, Mathieu Muniglia, Jean-Michel Do, Jean-Charles Le Pallec, Hubert Grard (CEA), Sébastien Verel (Univ du Littoral Côte d'Opale), Sylvain David (CNRS/IPNO)

11:20 am
16349 A Study on Optimal Position for the Secondary Neutron Source in PWRs, Jungwon Sun (KEPCO Nuclear Fuel Co. Ltd.), Mohd-Syukri Yahya, Yonghee Kim (KAIST)

AR SAFETY AND LICENSING—I

Co-chairs: Stefano Monti (IAEA), George F. Flanagan (ORNL)
Location: Marina

10:00 am
16372 Toward a Mechanistic Source Term in Advanced Reactors: A Review of Past U.S. SFR Incidents, Experiments, and Analyses, Matthew Bucknor, Acacia J. Brunett, David Grabaskas (ANL)

10:20 am
16382 Core Safety Calculations of the ALLEGRO Core, E. Temesvari, A. Kereszturi, I. Pataki, A. Tóta (Hungarian Academy of Sciences)

10:40 am
16395 Adaptation and Assessment of In-Containment Source Term Oriented Models for Sodium Fast Reactors (SFR) within the ASTEC-Na Code, C. Spengler, N. Reinke (GRS)

11:00 am
16483 Toward a Mechanistic Source Term in Advanced Reactors: Characterization of Radionuclide Transport and Retention in a Sodium Cooled Fast Reactor, Acacia J. Brunett, Matthew Bucknor, David Grabaskas (ANL)

SCALED EXPERIMENTS

Co-chairs: Kurshad Muftuoglu (GE Hitachi Nuclear Energy), Xiaodong Sun (Ohio State)
Location: Seacliff A

10:00 am
16344 Experimental Study on Heat Transfer and Pressure Drop of Water in Square Channel, Yun Guo, Hui Bao, Chang-Hong Peng (USTC)

10:20 am
16384 Influence of Solid Structure and Conjugate Heat Transfer Modeling on the Liquid Temperature Distribution Inside a Cylindrical Test Section, Angel Papukchiev (GRS)

10:40 am
16519 Design and Execution of the Test Campaign on the Bayonet Tube HERO-2 Component, Massimiliano Polidori, Giacomino Bandini, Calogera Lombardo, Paride Meloni (ENEA), Marco Enrico Ricotti, Stefano Cozzi (POLIMI), Andrea Achilli, Orlando De Pace, Davide Balestri, Gustavo Cattadori (SIET)

11:00 am
16641 Development of a Measurement Technique of Boric Acid Concentration in High Concentrated Aqueous Solutions, M. Childs, L. Kyffel, R.Vaghetto, Y. Hassan (Texas A&M)

11:20 am
16648 Experimental Studies on Thermal-Hydraulic Features in Tight Lattice Rod Bundles, Xiemei Lang, Houjun Gong, Feng Xie, Lei Zhou (Nuclear Power Inst of China)

TECHNICAL SESSIONS - 10:00 AM-12:00 PM

USED FUEL SEPARATION TECHNOLOGY

Co-chairs: Nicholas R. Brown (ORNL), Adrien Bidaud (Inst Polytechnique de Grenoble)
Location: Seacliff B

10:00 am
16306 Predictive Modeling of a Paradigm Spent Fuel Dissolver, James J. Peltz (KIT), Madalina C. Badea, Dan G. Cacuci (Univ of South Carolina), Aurelian F. Badea (KIT)

10:20 am
16479 Multi-Component Model for Actinides and Rare Earths Drawdown for Molten Salt Clean Up using Liquid Bismuth, Evan Wu, Jinsuo Zhang (Ohio State)

10:40 am
16629 Porous C@ETS-10 Sorbent for Capture of Krypton from Off-Gas Stream in Nuclear Power Plants, Sachin U. Nandanwar, Kai Coldsnow, Vivek P. Utgikar (Univ of Idaho), Piyush Sabharwall (INL), D. Eric Aston (Univ of Idaho)

11:00 am
16784 Development of Improved Targets, Separation Processes and Waste Management for ^{238} Pu Production, E. D. Collins, R. M. Wham (ORNL)

MAINTENANCE

Co-chairs: Donald Grove (Excelsior College), Vivek Agarwal (INL)
Location: Seacliff C

10:00 am
16537 Non-Critical Preventive Maintenance Optimization, Donald L. Grove, Sr. (Excelsior College)

10:20 am
16538 Electronic Work Packages (eWP) Improving Maintenance Productivity, Donald L. Grove, Sr. (Excelsior College)

10:40 am
16570 Feasibility Analysis for Deciding Optimal Replacement Period of In-Core Movable Detectors Using Calibration Thimbles' Detector Normalization Factors, Sang-il Ahn, Yong Kim, Kang Hwa Soo (KHNP)

11:00 am
16604 Open-Phase Faults Studies on the Standard Nuclear Power Plants in Korea, Choong-koo Chang (KINGS)

11:20 am
16976 Building the Technical Bases for Long-Term Operation of Light Water Reactors, Richard Tilley, Sherry Bernhoft, Robin Dyle (EPRI)

MATERIALS FOR FHRS/MSRS/LFRS

Co-chairs: Raluca Scarlat (Univ of Wisconsin, Madison), Jinsuo Zhang (Ohio State)
Location: Seacliff D

10:00 am
16430 Design and Construction of a High-Temperature Molten Salt Natural Circulation Test Loop, Chuangxiong Cai, Zhaozhong He, Kun Chen (China Academy of Sciences)

10:20 am
16600 Materials Corrosion and Electrochemistry in Molten FLiBe Salt for FHR Applications, T. Chrobak, K. Dolan, B. Kellehar, G. Zheng, K. Britsch, G. Cao, M. Anderson, K. Sridharan (Univ of Wisconsin, Madison), invited

10:40 am
16635 Measurements of Fluoride Salt Intrusion in Matrix Graphite and High Purity Graphite, Huali Wu, Jayeesh Bakshi, Nisarg Patel, Raluca O. Scarlat (Univ of Wisconsin, Madison)

Technical Sessions: Wednesday April 20

TECHNICAL SESSIONS - 10:00 AM-12:00 PM

LIQUID METAL/MOLTEN SALT TH—II

Co-chairs: Raluca O. Scarlat (Univ of Wisconsin, Madison), Xiaodong Sun (Ohio State)
Location: Waterfront AB

10:00 am
16278 IAEA NAPRO Coordinated Research Project: Heat Transfer and Pressure Drop Correlations for Sodium Cooled Systems, E. Bubelis, S. Perez-Martin (KIT), S. Passerini, C. Gerardi, C. Grandy (ANL), S. Jayaraj, F. Roelofs (NRG), C. Latge, A. Gerschenfeld, M. Anderhuber, L. Cachon, L. Matteo (CEA), S. Athmalingam, P. Selvaraj (IGCAR), S. Monti (IAEA)

10:20 am
16295 Benchmark Analysis of EBR-II Shutdown Heat Removal Test-17 using of Plant Dynamics Analysis Code and Subchannel Analysis Code, Norihiro Doda, Hiroaki Ohira, Hideki Kamide (JAEA)

10:40 am
16466 SOCRAT-BN Simulation of Siena Loss-of-Flow Experiments, Y. Y. Vinogradova, N. I. Ryzhov, V. N. Semenov, E. V. Usov, R. V. Chalyy (Nuclear Safety Inst)

11:00 am
16553 Benchmark Simulations of the Thermal-Hydraulic Responses during EBR-II Inherent Safety Tests using SAM, Rui Hu, Tyler Sumner (ANL)

TECHNICAL SESSIONS - 1:00-2:40 PM

KAZIMI SPECIAL SESSION—I

Co-chairs: Jacopo Buongiorno (MIT), Ed Pilat (MIT)
Location: Grand Ballroom A

1:00 pm
16494 An Uncertain Nuclear Future: Impacts of Nuclear Retirements and Prospects for Advanced Nuclear Technologies, Lara M. Pierpoint (DOE)

1:20 pm
16550 Application of Supercritical CO_2 Brayton Cycle for Small Modular Light Water Reactors, Shih-Ping Kao (MIT)

1:40 pm
16579 Investigations on the Fundamental Transport Phenomena of Supercritical Fluids Applications in Nuclear Energy Systems, Jiyun Zhao, Hui Cheng, Marcin Karol Rowinski (City Univ of Hong Kong), invited

2:00 pm
16589 Implementation of the Lax-Wendroff Method in COBRA-TF for Solving Two-Phase Flow Transport Equations, Kangyu Ren, Dean Wang (Univ of Massachusetts Lowell), Robert Salko (ORNL)

2:20 pm
16762 Mechanical Behavior of SiC Clad LWR Fuels for Steady-States and LOCA, Youho Lee (KAIST)

TECHNICAL SESSIONS - 1:00-2:40 PM

LWR CORE DESIGN—II (JOINT WITH TRACK 1)

Co-chairs: Christine Poinot-Salanon (CEA), Christopher A. Edgar (Georgia Tech)
Location: Golden Gate

1:00 pm
16357 Analysis and Design of a 333 MWth Marine PWR Core using Mixed D_2O-H_2O Coolant and Thorium-Based Checkerboard Micro-Heterogeneous and All-Uranium Fuel, Syed Bahauddin Alam, Hassan Mohamed, Benjamin A. Lindley, Geoffrey T. Parks (Univ of Cambridge)

1:20 pm
16358 Lattice Design and Coolant Selection for a 333 MWth PWR Civil Marine Propulsion Core using Thorium-Based Checkerboard Micro-Heterogeneous Fuel, Syed Bahauddin Alam, Hassan Mohamed, Benjamin A. Lindley, Geoffrey T. Parks (Univ of Cambridge)

1:40 pm
16733 The Effect of Plutonium Quality on Thorium-Plutonium Mixed Oxide Fuel in Light Water Reactors, S. L. Morrison, B. A. Lindley, G. T. Parks (Univ of Cambridge)

2:00 pm
16810 Neutronic Feasibility of a Soluble Boron-Free PWR Core Design with the BigT Burnable Absorbers, Mohd-Syukri Yahya, Yonghee Kim (KAIST), Hyeong Heon Kim (KEPCO E&C)

2:20 pm
16878 Development of RBWR (Resource-Renewable BWR) Fuel Assembly Components for Recycling and Transmutation of Transuranium Elements, Shiro Takahashi, Kiyoshi Fujimoto, Hideaki Hosoi (Hitachi)

AR SAFETY AND LICENSING—II

Co-chairs: Stefano Monti (IAEA), George F. Flanagan (ORNL)
Location: Marina

1:00 pm
16533 Codes and Standards Strategy for the ASTRID Project, M. Blanc, M. Trevisiol, M. Le Flem, C. Cabet, C. Petesch (CEA), B. Riou, D. Bonne (AREVA NP SAS), M. Blat-Yrieix (EDF R&D), G. Saunier (EdF/CEA)

1:20 pm
16385 Improvements in Simulation Tools to be Developed within the Framework of the ASTRID Project, Geneviéve Gaillard-Groleas, Jean-Claude Garnier (CEA), Jean-Marie Hamy (AREVA NP), Enrico Girardi (EdF), Masaru Hirata (JAEA) Jean-Paul Grouillier, Laurent Martin, Fréderic Serre, Mayeul Phelip, Christophe Döderlein, Bruno Michel, Marc Lainet, Bruno Fontaine, Christophe Suteau, Antoine Gerschenfeld, Jérome Cardolaccia (CEA)

1:40 pm
16625 ASTRID Nuclear Island Design: Advances in French-Japanese Joint Team Development of Decay Heat Removal Systems, Edouard Hourcade, Florence Curnier (CEA), Takatsugu Mihara (JAEA), Benjamin Farges, Jean François Dirat (AREVA NP), Akihiro Ide (MFBR)

2:00 pm
16116 The Innovative RBH Complementary Safety Device for ASTRID to Address Unprotected Loss of Flow Transients: from Design to Qualification, I. Guénot-Delahaie, D. Lorenzo, B. Valentin, M. Zabiego, V. Soukphouangkham, F. Biscarrat, T. Lambert, M. Phélip (CEA)

PASSIVE HEAT TRANSPORT—I

Co-chairs: Wade R. Marcum (Oregon State Univ), Annalisa Manera (Univ of Michigan)
Location: Seacliff A

1:00 pm
16444 Passive Decay Heat Removal System with Unlimited Operating Time for S-CO_2 Cooled Micro Modular Reactor, Jangsik Moon, Jeong Ik Lee, Yong Hoon Jeong (KAIST)

1:20 pm
16474 Flow Visualization in a SMR Containment Simulated by a Glass Test Facility, Fenglei Niu, Xiaowei Su, Weiqian Zhuo, Xingdi Cao (North China Electric Power Univ)

1:40 pm
16517 Thermal Hydraulic Performance of Large Water Pools with Shrouds Around Immersed Heat Exchanger, Sunil Kumar (Homi Bhabha National Inst), P. K. Vijayan (Homi Bhabha National Inst/BARC), U. Masankari Kannan (BARC)

2:00 pm
16776 Modeling the Thermal Evolution during Helium Leakage in a Vertical Steel Encased Concrete Cylinder, Jaime Penalva, Francisco Feria, Luis E. Herranz (CIEMAT)

Technical Sessions: Wednesday April 20

TECHNICAL SESSIONS - 1:00-2:40 PM

FUEL CYCLE ANALYSIS—I

Co-chairs: Florent Heidet (ANL), Tetsushi Hino (Hitachi)
Location: Seacliff B

1:00 pm
15732 French Transition Scenarios Toward a Symbiotic Nuclear Fleet, Guillaume Martin, Marion Tiphine, Christine Coquelet-Pascal (CEA)

1:20 pm
16407 Expanded Analysis of Transition to an Alternative Fuel Cycle, E. Hoffman (ANL), N. Brown (ORNL), B. Carlsen (INL), B. Feng (ANL), B. Hays (INL), G. Raitses (BNL), N. Stauff (ANL), E. Sunny, A. Worrall (ORNL)

1:40 pm
16505 A Two-Stage Fast Spectrum Fuel Cycle Option for Optimum Resource Utilization and Waste Management, Ching-Sheng Lin, Jacob S. Hader, Tongkyu Park, Wong Sik Yang (Purdue Univ)

2:00 pm
16318 Radioactive Waste Inventories in the Case of Different Nuclear Options for the French Reactor Fleet, A. Saturnin, J.- F. Milot, J.-L. Girotto, C. Chabert (CEA), C. Garzenne, F. Laugier (EdF), G. Senentz, P. Forbes, M. Caron-Charles (AREVA)

2:20 pm
16414 Impact of Minor Actinides Recycling on Sodium-Cooled Fast Reactor Fuel Cycles, F. Heidet, T. K. Kim, T. A. Taiwo (ANL)

SEVERE ACCIDENT TH

Chair: Kazuyuki Takase (JAEA) Co-chair: Haihua Zhao (INL)
Location: Seacliff C

1:00 pm
16120 MOCKA Experiments on LCS Concrete with and Without Rebars, J. J. Foit (KIT)

1:20 pm
16605 The Ultimate Response Guideline Simulation and Analysis by using MELCOR2.1/SNAP for Chinshan BWR/4 Nuclear Power Plant, Yu Chiang (Natl Tsing Hua Univ), Jonh-Rong Wang (Natl Tsing Hua Univ/ Nuclear and New Energy Education and Research Foundation), Ting-Yi Wang (Natl Tsing Hua Univ), Hao-Tzu Lin, Te-Chuan Wang (INER), Wen-Sheng Hsu (Nuclear Science and Technology Development Center), Jyh –Tong Teng (Chung Yuan Christian Univ), Shao-Wen Chen (Natl Tsing Hua Univ), Chunkuan Shih (Natl Tsing Hua Univ/Nuclear and New Energy Education and Research Foundation)

1:40 pm
16610 Simulation of QUENCH-LOCA Tests with ATHLET-CD, Thorsten Hollands, Christine Bals (GRS)

2:00 pm
16675 Aspects of In-Core Blockage for Analysis of Post-LOCA Long Term Cooling, Young Seok Bang, Sweng-Woong Woo, Tae-Suk Hwang (KINS)

ACCIDENT MANAGEMENT

Chair: Richard F. Wright (Westinghouse), Vivek Agarwal (INL)
Location: Seacliff D

1:00 pm
16316 Qualitative Analysis About Unsafe Act with Simulator Training Data, Sun Yeong Choi, Wondea Jung (KAERI)

1:20 pm
16350 Identification and Early Warning for NPP Accidents, Jian-Lun Huang, Hwai-Pwu Chou (Natl Tsing Hua Univ)

1:40 pm
16352 Accident Management Based on Computerized Emergency Operating Procedures, Yen Chun Chiu, Hwai-Pwu Chou (Natl Tsing Hua Univ)

2:00 pm
16353 Simulation of Severe Accident Management Measures for Selected LBLOCA Scenarios in a Generic PWR Konvoi Plant using ASTECV2.0, I. Gómez García-Toraño, V. Sánchez, R. Stieglitz (KIT)

TECHNICAL SESSIONS - 1:00-2:40 PM

WELDING AND JOINING METHODS

Co-chairs: Kumar Sridharan (Univ of Wisconsin, Madison), Celene J. Cabet (CEA)
Location: Waterfront AB

1:00 pm
16465 Fabrication of Diffusion Bonded 316L Stainless Steel Tube-to-Tube Sheet Joints for FHR Coil Tube Gas Heaters—An Overview, Nils Haneklaus (Univ of California, Berkeley), Rony Reuven (Univ of California, Berkeley/N.R.C.N.), Cristian Cionea, Peter Hosemann, Per F. Peterson (Univ of California, Berkeley)

1:20 pm
16488 Resistance Pressure Welding of HT9 Cladding Tubes, Micah J. Hackett (TerraPower, LLC)

1:40 pm
16608 Optimization and Development of the Manufacturing Process of Hexagonal Wrapper Tubes for ASTRID First Core Sub-Assemblies, P.-F. Giroux, P. Olier (CEA)

TECHNICAL SESSIONS - 3:00-4:20 PM

KAZIMI SPECIAL SESSION—II

Co-chairs: Jacopo Buongiorno (MIT), Ed Pilat (MIT)
Location: Grand Ballroom A

3:00 pm
16643 The Implication of Solving Inverse Problem in Nuclear System Thermal-Hydraulic Analysis, Jeong Ik Lee, Min-Gil Kim, Wonwoong Lee, (KAIST)

3:20 pm
16578 Development of a New CHF Correlation for the CANDU Fuel Bundle, Yüksel Parlatan Haldun O. Tezel, (OPG), invited

3:40 pm
16581 Phase 2 of the EBR-II SHRT-45R Benchmark Study—TerraPower's COBRA-4i-MIT Results, Ethan A. Bates, Bao Truong, Dustin Langewisch, Chris Gross (TerraPower LLC)

4:00 pm
16797 High Power Density Boiling Water Reactor Assembly Design for 500 and 5000 MWTH Designs, Koroush Shirvan (MIT)

LWR MODELING AND SIMULATION—I

Co-chairs: Youqi Zheng (UNIST), Christopher A. Edgar (Georgia Tech)
Location: Golden Gate

3:00 pm
16405 Thermohydraulics-Thermomechanics Best Estimate Coupled Approach in a Rod Ejection Accident Core Calculation, A. Targa (Ecole Polytechnique/CEA), J.-C. Le Pallec, P. Le Tallec, K. Nkonga, N. Crouzet, S. Chemin (CEA)

3:20 pm
16653 Analysis of Monte Carlo Solutions to Stylized PWR Benchmark Problems, Dingkang Zhang, Farzad Rahnema (Georgia Tech)

3:40 pm
16764 Research on Control Rod History Simulation Method in COSINE Code Package, Su Wang, Changhui Wang, Tongrui Yang, Hui Yu, Yixue Chen (SNPTC)

4:00 pm
16931 Water Distribution in a Nordic BWR Containment during a LOCA, Ignacio Gallego-Marcos, Walter Villanueva, Pavel Kudinov (KTH)

Technical Sessions: Wednesday April 20

TECHNICAL SESSIONS - 3:00-4:20 PM

AR SAFETY AND LICENSING—III

Co-chairs: Stefani Monte (IAEA), George F. Flanagan (ORNL)
Location: Marina

3:00 pm
16740 Predictability of Source Term Behavior in SFR Containments, L. E. Herranz, M. Garcia (CIEMAT), L. Lebel (IRSN), F. Mascari (ENEA), C. Spengler (GRS)

3:20 pm
16445 Scaling of the Chinese HTR-PM Reactor Design for Licensing and Testing at the Oregon State University High Temperature Test Facility, Jordan Cox, Brian Woods (Oregon State Univ)

3:40 pm
16809 On the Question of Decay Heat Removal System Redundancy for Fluoride Salt-Cooled High-Temperature Reactors (FHR), Joel Hughes, Maolong Liu, Bryan Wallace, Amir F. Ali (Univ of New Mexico), Michael Laufer (Univ of California, Berkeley), Matthew R. Denman (SNL), Nicolas Zweibaum, Per Peterson (Univ of California, Berkeley), Edward D. Blandford (Univ of New Mexico)

PASSIVE HEAT TRANSPORT—II

Co-chairs: Piyush Sabharwall (INL), Haihua Zhao (INL)
Location: Seacliff A

3:00 pm
16411 Comparison of RELAP5-3D Analyses to Experimental Data from the Natural Convention Shutdown Heat Removal Test Facility, Matthew Bucknor, Rui Hu, Darius Lisowski, Adam Kraus (ANL)

3:20 pm
16425 Transient Performance of Air-Cooled Condensing Heat Exchanger in Long-Term Passive Cooling System during Decay Heat Load, Myoung Jun Kim, Joo Hyung Moon, Youngmin Bae, Young In Kim (KAERI), Hee Joon Lee (Kookmin Univ)

3:40 pm
16640 Experimental Studies on Moderator Circulation Flow in the 1/4 Scaled Model of CANDU-6 Calandria, Hyoung Tae Kim, Boo Wook Rhee (KAERI), Sunghyuk Im, Hyung Jin Sung (KAIST)

4:00 pm
16777 Analysis of Secondary Side Passive Heat Removal Experiments with RELAP5 Code, Houjun Gong, Xi Zhao, Yanfeng Zan, Huang Yanping (CNNC)

FUEL CYCLE ANALYSIS—II

Co-chairs: Taek Kyum Kim (ANL), Guillaume Martin (CEA)
Location: Seacliff B

3:00 pm
16359 Impacts of Extended Used Fuel Storage on Performance of Fuel Cycles with Continuous Recycle of U/Pu or U/TRU, T. Fei, N. E. Stauff, T. K. Kim, T. A. Taiwo (ANL)

3:20 pm
16630 Fuel Cycle Performance of Thermal Spectrum Small Modular Reactors, Nicholas R. Brown, Andrew Worrall (ORNL), Michael Todosow (BNL)

3:40 pm
16662 Study of Argentinian and Brasilian Nuclear Symbiotic Scenarios using CLASS, Francisco Martin Alderete Tommasi (Univ Grenoble Alpes/Balseiro Inst), A. Bidaud (Univ Grenoble Alpes), B. Mouginot (Univ of Wisconsin, Madison), B. Leniau, N. Thiollière (Subatech), X. Dollingez (Univ d'Orsay), F. Courtin (Subatech), A. Sormani (Univ d'Orsay), J. B. Clavel (IRSN), Z. Issoufou, S. David (Univ d'Orsay)

4:00 pm
16793 3D Activation Modeling of Reactor Internals, and In-Containment Structures for Reactor Plant Decommissioning, Timothy M. Lloyd, Greg A. Fischer, Benjamin W. Amiri (Westinghouse)

TECHNICAL SESSIONS - 3:00-4:20 PM

CHF/DNB—I

Co-chairs: Bao-Wen Yang (Xian Jiao Tong Univ), In Cheol Bang (UNIST)
Location: Seacliff C

3:00 pm
16377 Study on Critical Heat Flux for Subcooled Flow Boiling with Non-Uniform Axial Heat Flux Distribution, Xirui Liu, Bao-Wen Yang, Sipeng Wang (Xi'an Jiaotong Univ)

3:20 pm
16487 CHF Measurement for Downward-Facing Stainless Steel and Carbon Steel Flat Plates under Pool Boiling Condition, Dong Hoon Kam, Young Jae Choi, Yong Hoon Jeong (KAIST)

3:40 pm
16499 Conservatisms, Provisions and Margins in DNB Analysis, Christophe Herer (IRSN)

4:00 pm
16750 Experimental Research of Critical Heat Flux on Pressure Lower Head External Surface under Severe Accident, Zhen Zhang, Wan Yu Xiong, WenBin Zhuo, PengZhou Li, Xiong Wang, Xueqiang Liu (Nuclear Power Inst of China)

CONTROL ROOMS AND SIMULATORS—I

Co-chairs: Joseph Naser (EPRI), Ray Torok (EPRI)
Location: Seacliff D

3:00 pm
16393 Development of an Engineering Simulator with Realistic Turbine Island Systems for NNP DCS Closed-Loop Test, YanKai Li, Meng Lin, Yueshan Zhou, YanHua Yang (Shanghai Jiao Tong Univ)

3:20 pm
16457 Development of Online Core Monitoring and Simulation System for OPR1000 and APR1400, Hye Young Jun, Hae-Chan Lee, Wi-Soo Jeong, Young-Ho Park (KEPCO NF)

3:40 pm
16720 Massive Update and Expansion of Human Factors Guidelines for Nuclear Power Plant Control Room and Other Human-System Interfaces, Joseph Naser (EPRI), Robert Fink (CDF Services), Lewis Hanes (Consultant), Charles Killian (CDF Services)

4:00 pm
16928 Results of Integrated Validation in a Hybrid Control Room, Jose Enrique Cerezal Diez, Marita Garrido Sánchez, Pedro TruebaAlonso, Luis Rjas López (Tecnatom)

LWR BDBE CLAD RESPONSE (JOINT WITH TRACK 1, 5)

Co-chairs: Paolo Ferroni (Westinghouse), Keizo Ishii (Department of Quantum Science and Energy)
Location: Waterfront AB

3:00 pm
16259 Influence of the Steam and Oxygen Flow Rate on the Reaction of Zirconium in Steam/Nitrogen and Oxygen/Nitrogen Atmospheres, Mirco Grosse, Martin Steinbrueck (KIT), Yunhwan Maeng , Joonyoung Sung (KIT/Handong Global Univ)

3:20 pm
16279 High Temperature Oxidation Behavior of Kanthal APM and D Alloys in Steam, Chongchong Tang, Martin Steinbrueck, Mirco Grosse, Adrian Jianu, Alfons Weisenburger, Hans Juergen Seifert (KIT)

3:40 pm
16379 High Temperature Oxidation of the Zr-1Nb-1Sn-0.1Fe Cladding Tube at the Temperatures of 1000 – 1200^{oC}, Cheol Min Lee, Tae Won Cho, Gwan Yoon Jeong, Mi Jin Kim, Ji-Hyeon Kim, Hee-Jae Lee (UNIST), Yong-kyoon Mok (KEPCO NF), Dong-Seong Sohn (UNIST)

4:00 pm
16399 Development of Zirconium-Silicide Coatings for Accident Tolerant Zirconium-Alloy Fuel Cladding, Hwasung Yeom, Ben Maier (Univ of Wisconsin, Madison), Robert Mariani, David Bai (INL), Peng Xu (Westinghouse), Kumar Sridharan (Univ of Wisconsin, Madison)

Technical Sessions: Wednesday April 20

TECHNICAL SESSIONS - 4:30-5:50 PM

NON-PROLIFERATION AND PHYSICAL PROTECTION

Co-chairs: Sama Bilbao y Leon (Virginia Commonwealth Univ), Alexander Chebeskov (Inst for Physics & Power)
Location: Grand Ballroom A

4:30 pm
16356 Theoretical Investigation of Spent Nuclear Fuel Monitoring using Cosmic Ray Muons, S. Chatzidakis, L. H. Tsoukalas (Purdue Univ)

4:50 pm
16433 Examination of Challenges in Nuclear Proliferation Risk Modeling, Chul Min Kim, Man-Sung Yim, Hyeon Seok Park (KAIST)

5:10 pm
16509 Estimation of Frequencies of Non-Nuclear Man-Caused Accidents in Korea, Man Choel Kim (Chung-Ang Univ)

LWR MODELING AND SIMULATION—II

Co-chairs: G. Ivan Maldonado (Univ of Tennessee), Deokjung Lee (UNIST)
Location: Golden Gate

4:30 pm
15785 Validation of the Nodal Drift Method on a CANDU LOCA and First Application to the TWIGL Seed-Blanket REA, A. Nuttin, P. Prévot, N. Capellan (LPSC), S. David, X. Doligez (IPNO), O. Meṕlan (LPSC)

4:50 pm
16410 Current Developments of the PWR Core Analysis Code RAST-K2.0, Youqi Zheng (Xi'an Jiaotong Univ/UNIST), Minyong Park, Deokjung Lee (UNIST), Eunki Lee, Ho-Cheol Shin (KHNP-CRI)

5:10 pm
16778 Eigenvalue Problem of the Neutron Diffusion Equation Discretized with the Finite Volume Method in a VVER, A. Bernal (ISIRYM), J. E. Roman (Univ Polit.cnica de Val.ncia), R. Miro, G. Verdu (ISIRYM)

AR SEVERE ACCIDENTS

Co-chairs: Richard B. Vilim (ANL), Koroush Shirvan (MIT)
Location: Marina

4:30 pm
16394 R&D and Experimental Programs to Support the ASTRID Core Assessment in Severe Accidents Conditions, F. Serre, F. Payot, C. Suteau, L.Trotignon (CEA), E. Bartyrbekov, A. Vurim, A. Pakhnits, V. Vityuk (NNC-RK), S. Kubo, A. Katoh, Y. Tobita, K. Kamiyama, K. Matsuba, J. Toyooka (JAEA)

4:50 pm
16043 A Study on the Thermal-Hydraulics in the Damaged Subassemblies under the Operation of Decay Heat Removal System, Ayako Ono, Takamitsu Onojima, Norihiro Doda (JAEA), Yasuhiro Miyake (NDD Corp), Hideki Kamide (JAEA)

5:10 pm
16706 Particle Generation during Sodium Pool Fires in SFR Beyond Design Basis Accidents, Luis E. Herranz, Monica Garcia (CIEMAT), Martin P. Kissane (OECD)

CFD ADVANCES

Co-chairs: Emilio Baglietto (MIT), Elia Merzari (ANL)
Location: Seacliff A

4:30 pm
15733 Coupling RELAP5-3D and STAR-CCM+ for Simulations of Steady and Transient Single Phase Flows, Antonello Palazzi, Michael J. Bluck (Imperial College London), Simon Lo, Sava Slijepcevic (CD-adapco)

4:50 pm
15817 CFD Simulation of Fuel Rod Bundles for Advanced Nuclear Reactors, Krishna Podila, Yanfei Rao (CNL)

5:10 pm
16437 Effect of Mixing Vane Grids on Temperature Field in Subchannel Analysis, Hu Mao, Bao-Wen Yang (Xi'an Jiaotong Univ)

TECHNICAL SESSIONS - 4:30-5:50 PM

CHF/DNB—II

Co-chairs: Bao-Wen Wang (X'ian Jiao Tong Univ), Eung Soo Kim (Seoul National Univ)
Location: Seacliff C

4:30 pm
15826 Design of Post-CHF Heat Transfer Experiments for High-Pressure and High-Flow Conditions, Qingqing Liu, Qiuping Lv, Shanbin Shi, Xiaodong Sun (Ohio State), Joseph Kelly (NRC)

4:50 pm
16416 Experimental Study of Critical Heat Flux Enhancement with Nanofluid during In-Vessel Retention, Katsuki Ryoji, Akio Sayano, Chikako Iwaki, Hisaki Sato, Yasunobu Fujiki (Toshiba), Daisuke Kanamori (Kansai Electric Power Co., Inc.)

5:10 pm
16470 Numerical Study on the Effect of Flow Instability in a 3 by 3 Channel, Sipeng Wang, Bao-Wen Yang, Xirui Liu (Xi.'an Jiaotong Univ)

5:30 pm
16471 Experiment of CHF Enhancement by Fe_3O_4 Nanoparticle Coating in Subcooled Boiling Region, Young Jae Choi, Dong Hoon Kam, Yong Hoon Jeong (KAIST)

CONTROL ROOMS AND SIMULATORS—II

Co-chairs: Ray Torok (EPRI), Joseph Naser (EPRI)
Location: Seacliff D

4:30 pm
16269 Development of an IAEA Sodium-Cooled Fast Reactor Basic Principles Simulator for Educational Purposes, Stefano Monti, Chirayu Batra, Chad L. Painter (IAEA)

4:50 pm
16497 Establishment of a Training Plan for the Regulatory Body of Mexico using IAEA's SARCoN Methodology, Christophe Herer (IRSN), Marianne Jelimski (GRS), Antonio Madonna (Consultant)

5:10 pm
16885 Managing Potential Vulnerabilities of Digital Instrumentation and Control Systems, Ray Torok (EPRI), Bruce Geddes (Southern Eng Services), Dave Blanchard (Applied Reliability Eng)

5:30 pm
16310 Development of Simulation Tools at EDF/SEPTEN, David Pialla, Simon Roberts, Benjamin Henssien (EdF)

ANS Meetings

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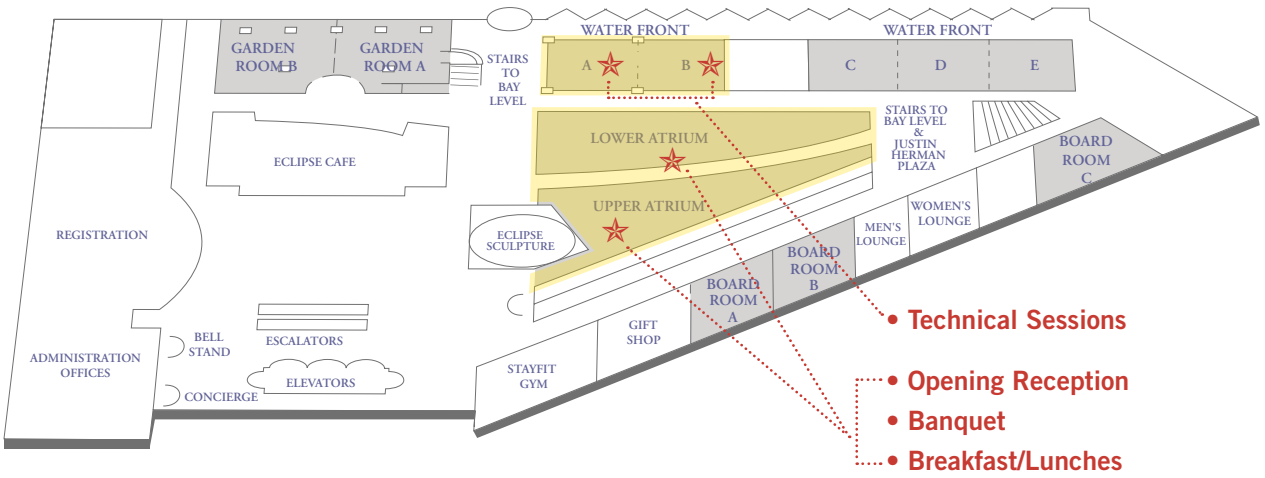

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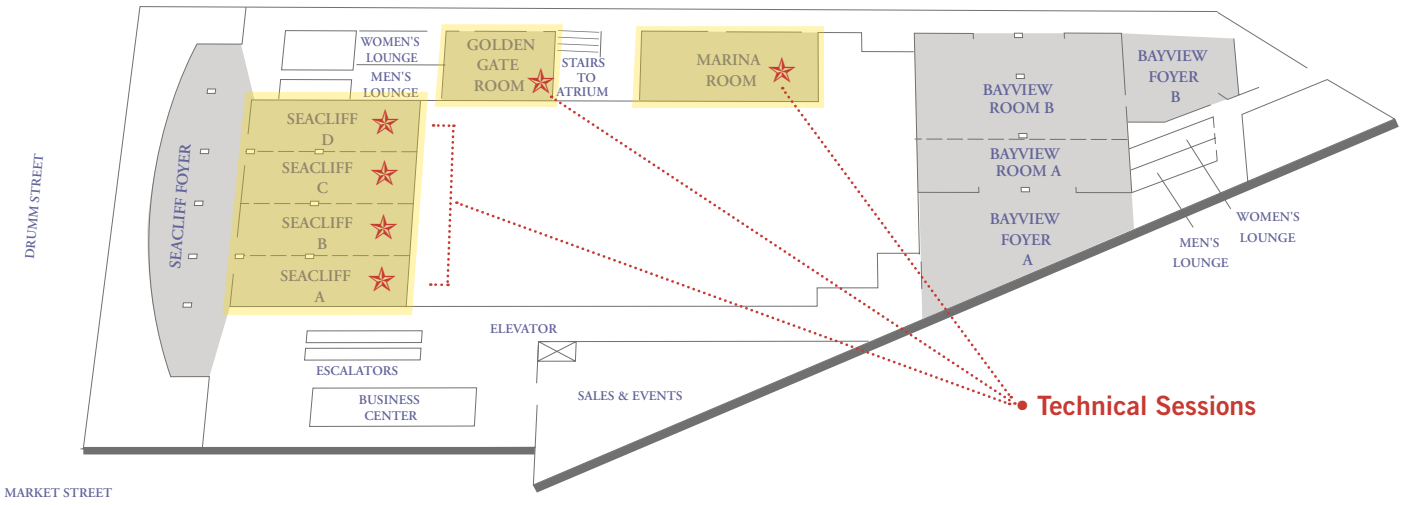

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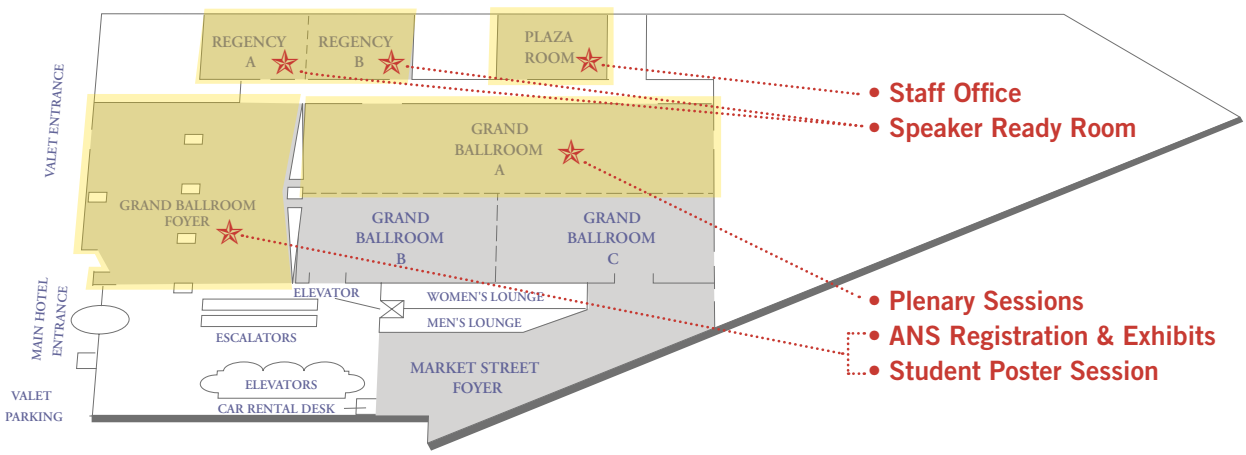

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