

# American Nuclear Society: 2010 ANNUAL MEETING

*“Nuclear Science and Technology – The Right Fit. The Right Time.”*

June 13–17, 2010 • San Diego, California • Town and Country Resort

## EMBEDDED TOPICAL MEETINGS:

- Second International Meeting of the Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH2)
- Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors
- International Congress on Advances in Nuclear Power Plants (ICAPP '10)



## PROFESSIONAL DEVELOPMENT WORKSHOPS:

- Preparing for the Nuclear Engineering Professional Engineering Exam
- Source Term Quantification for Nonreactor Nuclear Installation Safety Analysis

**OFFICIAL PROGRAM**

*our most sincere thanks  
to the following contributors  
for their support of the*

**2010 ANS Annual Meeting**

**“Nuclear Science and Technology – The Right Fit. The Right Time.”**

**Embedded Topical Meetings:**

**Second International Meeting of the Safety and Technology of  
Nuclear Hydrogen Production, Control, and Management (ST-NH2)**

**Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors**

**International Congress on Advances in Nuclear Power Plants (ICAPP'10)**

**PLATINUM**

**Southern California Edison**

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**Kiewit Power Constructors**

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**Xcel Energy Inc.**

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**Exelon Corporation**

**First Energy Foundation**

**Florida Power & Light Group**

**Hukari Technical Services, Inc.**

**Southern Nuclear Operating Company**

**The Yankee Companies**

***Thank You!***

## AMERICAN NUCLEAR SOCIETY: 2010 ANNUAL MEETING

“Nuclear Science and Technology — The Right Fit. The Right Time.”

### EMBEDDED TOPICAL MEETINGS

- Second International Meeting of the Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH2)
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*June 13-17, 2010 • San Diego, California • Town and Country Resort*

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**UPDATED: 6/9/2010**

*Cover Photo:  
Lord Hornblower cruising along the San  
Diego skyline.  
(Photo – Courtesy of Hornblower Cruises  
and Events)*

# Meeting Highlights

## SATURDAY, JUNE 12, 2010

8:00 AM – 5:00 PM	Teachers' Workshop
5:00 PM – 8:00 PM	Professional Divisions Workshop

## SUNDAY, JUNE 13, 2010

8:30 AM – 5:00 PM	Professional Development Workshop: “Preparing for the Nuclear Engineering Professional Engineering Exam”
8:30 AM – 5:00 PM	Professional Development Workshop: “Source Term Quantification for Nonreactor Nuclear Installation Safety Analysis”
1:00 PM – 1:30 PM	First-Time Attendees Orientation
4:00 PM – 5:00 PM	Student Assistant Training Session
5:00 PM – 6:00 PM	Mentoring Program
6:00 PM – 7:30 PM	ANS President's Reception
6:00 PM – 7:30 PM	ICAPP'10 Exhibit

## MONDAY, JUNE 14, 2010

7:00 AM – 2:30 PM	ICAPP'10 Exhibit
8:00 AM – 10:00 AM	Spouse/Guest Hospitality
8:00 AM – 11:30 AM	2010 ANS Annual Meeting: Plenary Session: “Nuclear Science and Technology — The Right Fit. The Right Time.”
9:30 AM – 1:30 PM	Spouse/Guest Tour: “Vintage Vineyard Tour”
11:30 AM – 1:00 PM	Attendee Luncheon in the ICAPP'10 Exhibit
11:30 AM – 1:00 PM	Operations and Power Division Luncheon
11:45 AM – 12:45 PM	Green Bag Lunch: “Conversations About Nuclear: Techniques & Resources”
1:00 PM – 2:30 PM	2010 ANS Annual Meeting: ANS President's Special Session: “U.S. Engagement in the Global Nuclear Renaissance—The Path Forward”
2:30 PM – 4:00 PM	2010 ANS Annual Meeting: Technical Sessions
2:30 PM – 4:00 PM	ICAPP'10: Technical Sessions
2:30 PM – 5:00 PM	ST-NH2: Keynote and Opening Plenary: “Nuclear Hydrogen Programs Around the World—Current Activities and Plans”
4:00 PM – 6:00 PM	ICAPP'10: Opening Plenary: “New Nuclear Build—Perspectives from Around the World”
6:30 PM – 10:30 PM	Evening Event: “Reception and Dinner at the USS Midway Museum”

## TUESDAY, JUNE 15, 2010

8:00 AM – 10:00 AM	ICAPP'10: Plenary 2: “Approach to Effective and Efficient Nuclear Power Regulation”
8:00 AM – 10:00 AM	Spouse/Guest Hospitality
8:15 AM – 9:50 AM	NFSM for NGNR: Opening Plenary
8:15 AM – 12:00 PM	ST-NH2: Technical Sessions
8:30 AM – 11:30 AM	2010 ANS Annual Meeting: Technical Sessions
10:00 AM – 1:30 PM	ICAPP'10 Exhibit

## TUESDAY, JUNE 15, 2010

10:00 AM – 12:00 PM	ICAPP'10: Technical Sessions
10:10 AM – 11:50 AM	NFSM for NGNR: Technical Sessions
11:30 AM – 1:00 PM	ANS Honors and Awards Luncheon
1:00 PM – 4:00 PM	2010 ANS Annual Meeting: Technical Sessions
1:00 PM – 4:00 PM	ICAPP'10: Technical Sessions
1:00 PM – 4:25 PM	ST-NH2: Technical Sessions
1:00 PM – 4:40 PM	NFSM for NGNR: Technical Sessions
1:00 PM – 5:00 PM	Spouse/Guest Tour: “San Diego by Land and Sea”
4:00 PM – 6:00 PM	ICAPP'10: Plenary 3: “An International Outlook on Nuclear Power”

## WEDNESDAY, JUNE 16, 2010

8:00 AM – 10:00 AM	ICAPP'10: Plenary 4: “Emerging & Future LWR Designs”
8:00 AM – 10:00 AM	Spouse/Guest Hospitality
8:30 AM – 11:20 AM	ST-NH2: Technical Sessions
8:30 AM – 11:30 AM	2010 ANS Annual Meeting: Technical Sessions
8:30 AM – 11:30 AM	NFSM for NGNR: Technical Sessions
10:00 AM – 12:00 PM	ICAPP'10: Technical Sessions
11:30 AM – 1:00 PM	MSTD Awards Luncheon
1:00 PM – 4:00 PM	2010 ANS Annual Meeting: Technical Sessions
1:00 PM – 4:00 PM	ICAPP'10: Technical Sessions
1:00 PM – 4:20 PM	NFSM for NGNR: Technical Sessions
1:30 PM – 4:25 PM	ST-NH2: Technical Sessions
4:00 PM – 6:00 PM	ICAPP'10: Plenary 5: “Global Nuclear Energy Opportunities and Obstacles”
4:15 PM – 5:15 PM	ANS Business Meeting
4:30 PM – 6:30 PM	Focus on Communications Workshop
6:00 PM – 10:30 PM	Evening Event: “Dinner Cruise on the Hornblower”
7:00 PM – 9:00 PM	NFSM for NGNR: Poster Session

## THURSDAY, JUNE 17, 2010

8:00 AM – 10:00 AM	ICAPP'10: Plenary 6: “Nuclear Fuel Cycle Options Perceptions and Realities”
8:30 AM – 10:15 AM	ST-NH2: Technical Session
8:30 AM – 11:30 AM	2010 ANS Annual Meeting: Technical Sessions
8:30 AM – 11:30 AM	NFSM for NGNR: Technical Sessions
10:00 AM – 12:00 PM	ICAPP'10: Technical Sessions
1:00 PM – 4:00 PM	ICAPP'10: Technical Sessions
1:00 PM – 4:00 PM	NFSM for NGNR: Technical Sessions
1:00 PM – 5:00 PM	Technical Tour: “DIII-D, Urban Maglev and Algae Biodiesel Facilities (at General Atomics)”

## FRIDAY, JUNE 18, 2010

8:00 AM – 5:00 PM	DOE Workshop
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# Meeting Officials



**GENERAL CHAIR:**  
**Ross T. Ridenoure**  
*Southern California Edison*



**ASSISTANT GENERAL CHAIR:**  
**Richard St. Onge**  
*Southern California Edison*



**TECHNICAL PROGRAM CHAIR (TPC):**  
**Kurshad Muftuoglu**  
*GE-Hitachi Nuclear Energy*



**ASSISTANT TPC:**  
**Larry Zull**  
*Defense Nuclear Facilities Safety Board*



**ASSISTANT TPC:**  
**Charlotta Sanders**  
*UNLV*



**ASSISTANT TPC:**  
**Sarah Kleeb**  
*Southern California Edison*



**FINANCE CHAIR:**  
**Edward L. (Ted) Quinn**  
*Consultant*



**STUDENT CHAIR:**  
**Chris Ellis**  
*General Atomics*



**TECHNICAL TOUR CHAIR:**  
**Henry Chiu**  
*General Atomics*



**MEDIA CO-CHAIR:**  
**Gil Alexander**  
*Southern California Edison*



**SPECIAL EVENTS CHAIR:**  
**Joanne Appel**  
*Southern California Edison*

**PHOTO NOT AVAILABLE:**

**MEDIA CO-CHAIR:**  
**Heather Lade**  
*General Atomics*

## Meeting Information

### “Nuclear Science and Technology – The Right Fit. The Right Time.”



Town and Country Resort—  
The Resort from the Riverwalk Golf Club.

#### MEETING INFORMATION

The 2010 ANS Annual Meeting will be held June 13-17, 2010, in San Diego, California.

There will be three embedded topical meetings held in conjunction with the 2010 ANS Annual Meeting: Second International Meeting of the Safety and Technology of Nuclear Hydrogen Production, Control, and Management (ST-NH2); Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors; and the International Congress on Advances in Nuclear Power Plants (ICAPP '10).

There will also be two Professional Development Workshops held in conjunction with the 2010 ANS Annual Meeting: “Preparing for the Nuclear Engineering Professional Engineering Exam” and “Source Term Quantification for Nonreactor Nuclear Installation Safety Analysis.”

#### ACCOMMODATIONS/ HOTEL INFORMATION

The Town and Country Resort will be the location for the 2010 ANS Annual Meeting, where all activities, technical sessions and governance committee meetings will take place.

#### ANS REGISTRATION

ANS Registration will be located in the Atlas Foyer of the hotel on Saturday, June 12, 2010 through Thursday, June 17, 2010. Meeting and workshop registration, speakers' & session chairs' desk and the message desk will also be located in the ANS registration area.

Meeting registration is required for all attendees and presenters. Badges are required for admission to all technical sessions, workshops and events.

#### REGISTRATION HOURS:

SATURDAY, JUNE 12<sup>TH</sup>

2:00 p.m. – 5:00 p.m.

SUNDAY, JUNE 13<sup>TH</sup>

11:00 a.m. – 7:00 p.m.

MONDAY, JUNE 14<sup>TH</sup>

7:30 a.m. – 5:00 p.m.

TUESDAY, JUNE 15<sup>TH</sup>

7:30 a.m. – 5:00 p.m.

WEDNESDAY, JUNE 16<sup>TH</sup>

7:30 a.m. – 5:00 p.m.

THURSDAY, JUNE 17<sup>TH</sup>

7:30 a.m. – 2:00 p.m.

\* **SUNDAY WORKSHOP ATTENDEES ONLY**

Registration for the ANS Professional Development Workshops will take place in the Atlas Foyer of the hotel on Sunday, June 13, 2010, 7:30 A.M. - 9:00 A.M.

NOTE: Only workshop information will be available; all other registrants see times and location above.

#### FIRST-TIME ATTENDEE ORIENTATION

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

Whether you are a member or not, student or professional, if this is your first ANS national meeting, the Membership Committee invites you to attend this session, which will be held 1:00–1:30 p.m. on Sunday, June 13, 2010, in the Clarendon Room.

#### STUDENT ASSISTANT PROGRAM

Attendance at the 2010 ANS Annual Meeting is an exciting professional opportunity for college and graduate students. To help defray travel and living expenses, students can sign up to work as session chairs' assistants. Student assistants must attend the student training session on Sunday, June 13, 2010, 4:00 p.m. – 5:00 p.m. in the Windsor Room.

Student assistants receive free meeting registration and a copy of the meeting TRANSACTIONS. All students are responsible for paying their own room, tax, and incidentals. ANS student members who register for the meeting and/or work as session chairs' assistants should pick up a travel assistance form which can be found in the student headquarters room. Student travel assistance is provided through contributions from the ANS professional divisions.

The student headquarters room will be located in the Esquire Room.

#### MENTORING PROGRAM

A special mentoring program will be held from 5:00 p.m. – 6:00 p.m. on Sunday, June 13, 2010, in the Royal Palm One Room.

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

#### NOTICE FOR SPEAKERS

All speakers and session chairs must sign in at the “Speakers' Desk,” located in the Atlas Foyer of the hotel during registration hours.

A Speakers' Preview Room, the Devonshire room of the hotel, will be available during the following hours:

SUNDAY, JUNE 13<sup>TH</sup>

7:30 a.m. – 3:00 p.m.

MONDAY, JUNE 14<sup>TH</sup>

7:00 a.m. – 4:00 p.m.

TUESDAY, JUNE 15<sup>TH</sup>

7:00 a.m. – 4:00 p.m.

WEDNESDAY, JUNE 16<sup>TH</sup>

7:00 a.m. – 4:00 p.m.

THURSDAY, JUNE 17<sup>TH</sup>

7:00 a.m. – 12:00 p.m.

Audio/visual equipment will be set up; so, that speakers may preview their presentation material.

#### ICAPP'10 EXHIBIT

The ICAPP'10 Exhibit will take place Sunday–Tuesday in the Grand Exhibit Hall. Please turn to page 59 for additional information.

## CONFERENCE OFFICE

SATURDAY, JUNE 12TH  
7:00 a.m. – 5:00 p.m.  
SUNDAY, JUNE 13TH  
7:00 a.m. – 5:00 p.m.  
MONDAY, JUNE 14TH  
7:00 a.m. – 5:00 p.m.  
TUESDAY, JUNE 15TH  
7:00 a.m. – 5:00 p.m.  
WEDNESDAY, JUNE 16TH  
7:00 a.m. – 5:00 p.m.  
THURSDAY, JUNE 17TH  
7:00 a.m. – 2:00 p.m.

Location: Terrace Salon One

## ANS SECRETARIAT

SUNDAY, JUNE 13TH  
7:00 a.m. – 5:00 p.m.  
MONDAY, JUNE 14TH  
7:00 a.m. – 5:00 p.m.  
TUESDAY, JUNE 15TH  
8:00 a.m. – 5:00 p.m.  
WEDNESDAY, JUNE 16TH  
8:00 a.m. – 5:00 p.m.

Location: Terrace Salon Two

## ANS MEDIA CENTER

MONDAY, JUNE 14TH  
7:45 a.m. – 4:00 p.m.  
TUESDAY, JUNE 15TH  
8:00 a.m. – 4:00 p.m.  
WEDNESDAY, JUNE 16TH  
8:00 a.m. – 4:00 p.m.

Location: Terrace Salon Three

## GREEN BAG LUNCH “Conversations About Nuclear: Techniques and Resources”

MONDAY, JUNE 14, 2010  
11:45 a.m. – 12:45 p.m.  
Location: Brittany Room

Please join us for an interactive discussion of successful techniques for starting conversations about nuclear topics with friends, neighbors, and community groups. The program will include suggestions for resources available from ANS and other organizations. Plan on bringing your lunch and trading ideas with other attendees.

## FOCUS ON COMMUNICATIONS WORKSHOP

WEDNESDAY, JUNE 16, 2010  
4:30 p.m. – 6:30 p.m.  
Location: Royal Palm One

In the wake of the nation's largest oil spill and the environmental disaster that it spawned in the Gulf of Mexico, energy and environment are becoming increasingly urgent topics both in Washington, D.C., and around the U.S. The stark reality of the real environmental impact of fossil fuels, is creating an opportunity to generate more support for new nuclear energy facilities and to continue extending the lives of existing facilities. While the crisis in the Gulf has negatively affected the credibility of institutions, it has made individual communications by experts even more important. This workshop will be devoted to the ways in which ANS members can communicate credibly and compellingly about nuclear energy in their communities and with policy makers.

Craig Piercy, ANS Washington Representative, and Mimi Limbach, Senior Partner in Potomac Communications Group, will lead the workshop.

## SPOUSE/GUEST HOSPITALITY

Spouse/guest hospitality breakfast will be served from 8:00 a.m. – 10:00 a.m., Monday, June 14, 2010, through Wednesday, June 16, 2010, in the Tiki Pavilion.

Continental breakfast will be served each morning. Spouse/guest registration is required for admittance to the spouse/guest hospitality breakfast. Spouse/guest registration includes one ticket to the president's reception and admittance to the spouse/guest breakfast only – it does not include technical sessions or other events. Spouse/guest tours are scheduled. Registration for the tours is separate from the spouse/guest meeting registration.

## ATTENTION RUNNERS: ANS FUN RUN

On Tuesday, June 15, 2010, there will be a noncompetitive run starting at 6:00 a.m. from the front entrance of the hotel. We are looking forward to seeing you at the fun run in San Diego, CA. Bring shoes and a big smile.

## PROFESSIONAL DEVELOPMENT WORKSHOPS

*PLEASE NOTE:  
Registration for the workshop(s) is separate from, and in addition to, the meeting registration fee.*

### Professional Development Workshop #1:

*“Preparing for the Nuclear  
Engineering Professional  
Engineering Exam”*

SUNDAY, JUNE 13, 2010  
8:30 a.m. – 5:00 p.m.  
Location: Pacific Salon Four

*Registration price for the workshop is \$450 for ANS members and \$550 for non-members.*

### Professional Development Workshop #2:

*“Source Term Quantification  
for Nonreactor Nuclear  
Installation Safety Analysis”*

SUNDAY, JUNE 13, 2010  
8:30 a.m. – 5:00 p.m.  
Location: Pacific Salon Five

*Registration price for the workshop is \$450 for ANS members and \$550 for non-members.*

## DOE WORKSHOP

*“Hazard Evaluation Techniques”*  
DOE NCSP HAZARD EVALUATION  
TECHNIQUES WORKSHOP  
Sponsored by NNSA

FRIDAY, JUNE 18, 2010  
8:00 a.m. – 5:00 p.m.  
Location: Windsor Room

*There is no registration fee for this workshop. Please turn to page 63 for additional information.*

## NAVY SUBMARINE TOUR

JUNE 17, 2010

Tour #1: 1:00 PM  
Tour #2: 3:00 PM

The following tour is available to attendees of the ANS 2010 Annual Meeting.

Transportation will be provided to Naval Submarine Base Point Loma and attendees will tour a fast attack submarine and speak with the crew. Attack submarines are designed to seek and destroy enemy submarines and surface ships; project power ashore with Tomahawk cruise missiles and Special Operation Forces; carry out Intelligence, Surveillance, and Reconnaissance (ISR) missions; support Carrier Strike Groups; and engage in mine warfare.

Please respond to christina.kasm@navy.mil with your first and last names and the last four numbers of your SSN. The tours are restricted to US citizens.

There will be a table in the registration area for sign up beginning Sunday, June 13, through Wednesday, June 16. When you sign up, please provide your Full Name, last four numbers of your SSN, and have a photo id available on the day of the tour.

# Special Events

## CONFERENCE LUNCHEONS Attendee Luncheon in the ICAPP'10 Exhibit

MONDAY, JUNE 14, 2010  
11:30 A.M. – 1:00 P.M.  
LOCATION: Grand Exhibit Hall  
*One ticket is included with the full meeting registration. Additional tickets can be purchased at the ANS Registration Desk for \$45.*

## Operations and Power Division Luncheon

MONDAY, JUNE 14, 2010  
11:30 A.M. – 1:00 P.M.  
LOCATION: Tiki Pavilion  
*Tickets can be purchased at the ANS Registration Desk for \$50.*

## Honors and Awards Luncheon

TUESDAY, JUNE 15, 2010  
11:30 A.M. – 1:00 P.M.  
LOCATION: Golden West  
*Tickets can be purchased at the ANS Registration Desk for \$50.*

## Materials Science and Technology Division (MSTD) Awards Luncheon

WEDNESDAY, JUNE 16, 2010  
11:30 A.M. – 1:00 P.M.  
LOCATION: Stratford  
Presentation by  
Dr. Theodore M. Besmann,  
Mishima Award Winner,  
Oak Ridge National Laboratory.  
*Tickets can be purchased at the ANS Registration Desk for \$50.*

## EVENING EVENTS

### PLEASE NOTE:

- *You must be registered for the meeting to attend evening events.*
- *Times listed are departure times and return times to/from the hotel. Busses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*

## ANS President's Reception

SUNDAY, JUNE 13, 2010  
6:00 P.M. – 7:30 P.M.  
LOCATION: Grand Exhibit Hall  
*One ticket to the ANS President's Reception is included in the full meeting registration fee. Additional tickets can be purchased at the ANS Registration Desk for \$85.*

## Reception and Dinner on the U.S.S. Midway Museum

MONDAY, JUNE 14, 2010  
6:30 P.M. – 10:30 P.M.  
*Times listed are departure times and return times to/from the hotel.  
Busses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*

Imagine experiencing life at sea aboard one of America's longest-serving aircraft carriers. Visitors to the U.S.S. Midway Museum enter a floating city at sea and walk in the footsteps of 225,000 Midway sailors who served our country and upheld the American ideals of strength, freedom and peace.

Prepare yourself for a lifetime memory aboard the U.S.S. Midway Museum. You'll relive nearly 50 years of world history aboard the longest-serving Navy aircraft carrier of the 20th century.

## Dinner Cruise on the Hornblower

WEDNESDAY, JUNE 16, 2010  
6:00 P.M. – 10:30 P.M.  
*Times listed are departure times and return times to/from the hotel.  
Busses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*

The Hornblower Dinner Cruise provides a celebration of imaginative cuisine and gracious service in an unforgettable setting. San Diego is most beautiful when seen from the water at night. You will cruise the sparkling bay and watch the city lights reflect on the peaceful water.

Your yacht, Lord Hornblower, awaits you at the dock for an evening of splendor. Lord Hornblower is a magnificent 151 foot yacht styled after the turn-of-the-century steamships. This is truly an experience of elegant dining and relaxation.

***"Midway could launch a massive air craft about every 60 seconds."***

Exhibits range from the crew's sleeping quarters to a massive galley, engine room, the ship's jail, officer's country, post office, machine shops, and pilots' ready rooms, as well as primary flight control and the bridge high in the island over the flight deck.

### PLEASE NOTE:

Midway is a WWII-era warship. Handicapped elevator access is available from Navy Pier to the Hangar Deck and from the Hangar Deck to the Flight Deck.

Handicap access is also available from the Hangar Deck to portions of the Mess Deck.



**USS Midway and the San Diego Skyline**  
(Photo – Courtesy of USS Midway Museum)

For all other guests, access from Navy Pier to the Hangar Deck includes approximately two flights of stairs and one large flight of stairs between the Hangar Deck and the Flight Deck.

Comfortable clothing and shoes with non-skid soles (no spike heels) are strongly recommended. Bare feet are not permitted at any time.

*Tickets can be purchased at the ANS Registration Desk for \$60.*



**Lord Hornblower cruising along the San Diego skyline.**  
(Photo – Courtesy of Hornblower Cruises and Events)

You will enjoy a seated three-course dinner prepared by onboard chefs. Make sure to save room for a scrumptious dessert!

You will enjoy gracious hospitality and great views of the U.S.S. Midway, Coronado Bridge,

Cabrillo National Monument and the California sea lions that splash just off Shelter Island. This evening will sparkle in your memory.

*Tickets can be purchased at the ANS Registration Desk for \$55.*

## SPOUSE/GUEST TOURS

### Vintage Vineyard Tour

MONDAY, JUNE 14, 2010  
9:30 A.M. – 1:30 P.M.

*Times listed are departure times and return times to/from the hotel. Buses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*



**“Temecula Valley — A veritable paradise encompassing an area that includes over 35,000 acres of rolling hills and vineyards.”**

While most of the world thinks that the only California wines are produced in the Northern California’s Sonoma and Napa regions, Southern California has some great wineries of its own. One hour north of San Diego County, nestled in the Rainbow Gap, is the beautiful wine-producing region of Temecula Valley.

Temecula Valley is only twenty-two miles inland where one can see and feel the ocean’s influence — morning fog, gusty afternoon breezes, and cool clear nights provide an ideal grape growing climate.

Your vineyard excursion will include a private tour and tasting at one local winery along with light snacks to accompany the wines you will sample.

*Tickets can be purchased at the ANS Registration Desk for \$60.*

### San Diego by Land and Sea

TUESDAY, JUNE 15, 2010  
1:00 P.M. – 5:00 P.M.

*Times listed are departure times and return times to/from the hotel. Buses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*

See San Diego as this beautiful West Coast city should be seen, from the land and from the sea. This informative journey will introduce you to San Diego past, present and future.

Your tour will go through the historic Gaslamp Quarter, originally developed by Alonzo Horton in 1854. The contemporary architecture of recent developments in this heart of Downtown San Diego complement the original buildings from the 1800’s that have been so lovingly restored. Balboa Park will be highlighted with its many museums and galleries housed in buildings of Spanish-Moorish

architecture dating back to the 1915 Pan-American Exposition.

To capture the true essence of this dynamic seaside city, you will step aboard a large cruise boat for a one-hour fully narrated tour of San Diego’s Big Bay. While on-board, you will enjoy scenes of Coronado, North Island Naval Air Station, the Embarcadero and Cabrillo National Park that are best viewed from the water.

Back on land, your journey will continue to picturesque “Old Town” the first European settlement in California, where you will have some free time to enjoy the unique shops, sample some local fare, and travel back to early San Diego by way of Old Town’s many historic displays. “America’s Finest City,” is waiting to be discovered!

*Tickets can be purchased at the ANS Registration Desk for \$47.*

## TECHNICAL TOUR DIII-D, Urban Maglev and Algae Biodiesel Facilities (at General Atomics (GA))

THURSDAY, JUNE 17, 2010  
1:00 P.M. – 5:00 P.M.

*Times listed are departure times and return times to/from the hotel. Buses will leave promptly from the Atlas Foyer Entrance (West) of the Town and Country Resort.*

The technical tour will include the DIII-D Tokamak National Fusion Experiment, the Urban Maglev vehicle test track and the Algae Biodiesel Demonstration at GA.



Urban Maglev Vehicle

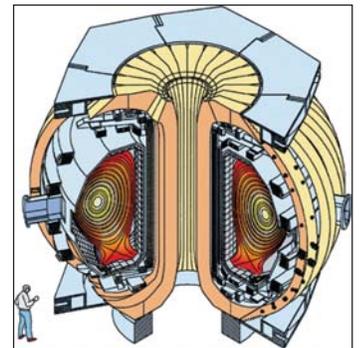
The first stop will be at the Urban Maglev vehicle test track at GA. The goal of this program is to develop magnetic levitation technology that is a cost-effective, reliable, and environmentally friendly option for urban mass transportation in the United States. The system is levitated, propelled, and guided by electromagnetic forces. Levitation is achieved by using simple, passive permanent magnets arranged in a “Halbach” array configuration under the vehicle. Propulsion and guidance are achieved by a linear synchronous motor mounted on the track.

GA’s Algae Biodiesel Demonstration is the next stop on the tour. Algae can produce substantial quantities of bio-oils that can be refined into biodiesel. GA is currently engaged in research and development on the microalgae technology necessary to achieve economic production of this renewable, sustainable and secure biofuel.

Light refreshments will be provided at GA, with a presentation on GA’s Modular Helium Reactor development program, including gas turbine electric power production, thermochemical hydrogen production and Deep Burn spent fuel management applications.

Finally, a tour will be given of the DIII-D National Fusion Research Facility, located at GA. The DIII-D tokamak is the largest magnetic fusion research device in the US. This tokamak magnetic plasma confinement device is used by teams of researchers from all over the US and around the world, and is developing the plasma physics knowledge needed to move forward on the International Thermonuclear Experimental Reactor (ITER) fusion demonstration project.

*Tickets are no longer available.*



Schematic of DIII-D Tokamak National Fusion Research Facility



Interior of DIII-D Tokamak Plasma Reaction Chamber

# Technical Sessions by Division

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*(Asterisks indicate special sessions. Parentheses indicate cosponsorship.)*

## Special Sessions

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\*Opening Plenary: Nuclear Science and Technology—The Right Fit. The Right Time, Mon. a.m. (8:00-11:30 a.m.)

\*ANS President's Special Session: U.S. Engagement in the Global Nuclear Renaissance—The Path Forward, Mon. p.m. (1:00-2:30 p.m.)

## Accelerator Applications (AAD)

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Nuclear Applications of Particle Accelerators: General, Mon. p.m.

(Food Irradiation—I, Wed. a.m.)

(Food Irradiation—II—Panel, Wed. p.m.)

## Biology and Medicine (BMD)

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(Neutron Beam Technique Developments and Utilizations at Research Reactors, Tues. a.m.)

Food Irradiation—I, Wed. a.m.

Food Irradiation—II—Panel, Wed. p.m.

## Decommissioning, Decontamination, and Reutilization (DDR/D)

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Hot Topics and Emerging Issues, Mon. p.m.

## Education, Training, and Workforce Development (ETWDD)

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The Need for Nuclear Engineers with a Professional Engineering License—Paper/Panel, Tues. a.m.

Training, Human Performance, and Workforce Development, Tues. p.m.

Innovations in Nuclear Engineering Education, Training, and Distance Learning, Tues. p.m.

Focus on Communications: Credibility in a Digital Age—Panel, Wed. a.m.

Focus on Communications: Keeping Nuclear Communications Relevant—Panel, Wed. p.m.

## Environmental Sciences (ESD)

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Environmental Sciences: General, Mon. p.m.

Uranium Recovery: Reducing Environmental Impacts Through Technological Advances and Improved Operational Practices, Wed. p.m.

## Fuel Cycle and Waste Management (FCWMD)

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Hybrid Fission-Fusion Systems for Transmutation of Waste, Mon. p.m.

MOX Fuel Fabrication Facility: Overcoming Supplier Qualification Challenges for the Nuclear Renaissance—Panel (in collaboration with the Special Committee on Nuclear Nonproliferation), Tues. a.m.

Waste Management Alternatives, Tues. p.m.

Safeguards, Nonproliferation, and Material Detection (in collaboration with the Special Committee on Nuclear Nonproliferation), Tues. p.m.

Solid Waste Recycling—Panel, Wed. a.m.

New Developments in Advanced Fuel Cycles, Wed. p.m.

(Uranium Recovery: Reducing Environmental Impacts Through Technological Advances and Improved Operational Practices, Wed. p.m.)

Behavior and Performance of Fuels for Advanced Fuel Cycles, Thurs. a.m.

## Fusion Energy (FED)

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(Hybrid Fission-Fusion Systems for Transmutation of Waste, Mon. p.m.)

## Human Factors, Instrumentation, and Controls (HFICD)

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Human Factors, Instrumentation, and Controls: General, Wed. p.m.

## Isotopes and Radiation (IRD)

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Neutron Beam Technique Developments and Utilizations at Research Reactors, Tues. a.m.

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

## Mathematics and Computation (MCD)

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Current Issues in Computational Methods—Roundtable/Panel, Mon. p.m.

Transport Methods: General, Tues. a.m.

Uncertainty Quantification in Nuclear System Modeling and Simulation, Tues. p.m.

Computational Methods and Mathematical Modeling, Wed. a.m.

(Reactor Analysis Methods, Wed. a.m.)

## Nuclear Criticality Safety (NCSD)

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Data, Analysis, and Operations in Nuclear Criticality Safety—I, Tues. a.m.

Data, Analysis, and Operations in Nuclear Criticality Safety—II, Tues. p.m.

Computational Advances in Criticality Safety Analysis, Tues. p.m.

Hazard Analysis of Nuclear Criticality Safety Evaluations—I—Tutorial, Wed. a.m.

Hazard Analysis of Nuclear Criticality Safety Evaluations—II—Tutorial, Wed. p.m.

Nuclear Criticality Safety Standards—Forum, Thurs. a.m.

## Nuclear Installation Safety (NISD)

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Proposed Solutions for SMR Generic Licensing Issues, Mon. p.m.

Severe Accident Analyses for Current and Advanced Reactors, Tues. a.m.

Regulatory and Safety Analyses for Severe and Design-Basis Accidents, Tues. p.m.

Advances in Safety Assessment Methods and Programs, Wed. a.m.

## Technical Sessions by Division

### Operations and Power (OPD)

Operations and Power: General—I, Mon. p.m.  
(Proposed Solutions for SMR Generic Licensing Issues, Mon. p.m.)  
Update on LWR Sustainability Program R&D Overview—Panel, Tues. a.m.  
Challenges for New Plant Workforce Development and Training, Tues. a.m.  
Plant Performance After Power Uprate—Panel, Tues. p.m.  
Licensing of a Digital Upgrade—I, Wed. a.m.  
Lessons Learned in the 10 CFR 52 Process: A Status Report—Panel, Wed. a.m.  
Licensing of a Digital Upgrade—II—Panel, Wed. p.m.  
Operations and Power: General—II, Thurs. a.m.  
Advanced/Generation-IV Reactors, Thurs. a.m.

### Radiation Protection and Shielding (RPSD)

Current Topics in Radiation Protection and Shielding—Roundtable, Mon. p.m.  
Modeling and Simulation Efforts for Nuclear Nonproliferation—I, Tues. a.m.  
Modeling and Simulation Efforts for Nuclear Nonproliferation—II, Tues. p.m.  
Radiation Protection and Shielding: General, Wed. a.m.  
Computational Resources for Radiation Modeling, Wed. a.m.

The Helium-3 Shortage and the Future of Neutron Detection—Panel, Wed. p.m.  
Point Kernel Shielding Techniques: A Tutorial on Quads/QAD MDD, Thurs. a.m.

### Reactor Physics (RPD)

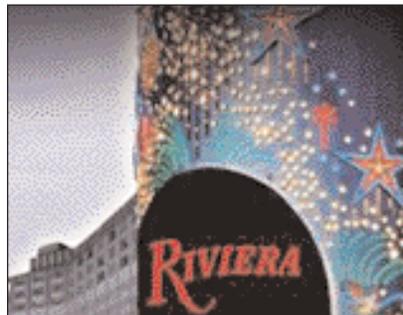
Current Issues in LWR Core Design and Reactor Engineering Support—Panel, Mon. p.m.  
Reactor Physics: General—I, Tues. a.m.  
Reactor Physics: General—II, Tues. p.m.  
Advances in Reactor Core Analysis Methods to Meet the Challenges of Next-Generation and Advanced NPP Designs, Tues. p.m.  
Reactor Analysis Methods, Wed. a.m.  
Reactor Analysis Design Validation and Operating Experience, Wed. p.m.  
Advances in Small- and Medium-Sized Reactor Designs, Thurs. a.m.

### Thermal Hydraulics (THD)

Computational Two-Phase Flow, Mon. p.m.  
Thermal Hydraulics of VHTR, Tues. a.m.  
Computational Thermal Hydraulics, Tues. p.m.  
Scaling Analysis Techniques—Tutorial, Wed. a.m.  
General Thermal Hydraulics—I, Wed. p.m.  
General Thermal Hydraulics—II, Thurs. a.m.

## American Nuclear Society: 2010 Winter Meeting and Nuclear Technology Expo

November 7–11, 2010 • Las Vegas, Nevada • Riviera Hotel



### and EMBEDDED TOPICAL MEETINGS:

- 19th Topical Meeting on the Technology of Fusion Energy (TOFE)
- 7th International Topical Meeting on Nuclear Plant Instrumentation, Control and Human Machine Interface Technologies (NPIC&HMIT 2010)
- Isotopes for Medicine and Industry

Visit the ANS home page [www.ans.org](http://www.ans.org) for future meetings and more!

# Condensed Schedule

ROOM	MONDAY, JUNE 14, 2010			TUESDAY, JUNE 15, 2010	
	8:00 AM - 11:30 AM	1:00 PM - 2:30 PM	2:30 PM - 4:00 PM	8:30 AM - 11:30 AM	1:00 PM - 4:00 PM
<b>Golden Ballroom</b>	Opening Plenary: Nuclear Science and Technology—The Right Fit. The Right Time.	ANS President's Special Session: U.S. Engagement in the Global Nuclear Renaissance—the Path Forward			
<b>Royal Palm Salon 1</b>			Current Topics in Radiation Protection and Shielding—Roundtable	Modeling and Simulation Efforts for Nuclear Nonproliferation—I	Modeling and Simulation Efforts for Nuclear Nonproliferation—II
<b>Royal Palm Salon 2</b>			Proposed Solutions for SMR Generic Licensing Issues—Panel	Severe Accident Analyses for Current and Advanced Reactors	Regulatory and Safety Analyses for Severe and Design-Basis Accidents
<b>Royal Palm Salon 3</b>			Environmental Sciences: General	Transport Methods: General	Uncertainty Quantification in Nuclear System Modeling and Simulation
<b>Royal Palm Salon 4</b>				Neutron Beam Technique Developments and Utilizations at Research Reactors	Isotopes and Radiation: General
<b>Royal Palm Salon 5</b>			Operations and Power: General—I	Update on LWR Sustainability Program R&D Overview—Panel	Plant Performance After Power Uprate—Panel
<b>Royal Palm Salon 6</b>			Hot Topics and Emerging Issues	Challenges for New Plant Workforce Development and Training	Waste Management Alternatives
<b>Windsor</b>			Computational Two-Phase Flow	Thermal Hydraulics of VHTR	Computational Thermal Hydraulics
<b>Hampton</b>			Current Issues in Computational Methods—Roundtable/Panel	Data, Analysis, and Operations in Nuclear Criticality Safety—I	Data, Analysis, and Operations in Nuclear Criticality Safety—II ----- Computational Advances in Criticality Safety Analysis
<b>Sheffield</b>			Current Issues in LWR Core Design and Reactor Engineering Support—Panel	Reactor Physics: General—I	Reactor Physics: General—II ----- Advances in Reactor Core Analysis Methods to Meet the Challenges of Next-Generation and Advanced NPP Designs
<b>Brittany</b>			Hybrid Fission-Fusion Systems for Transmutation of Waste	MOX Fuel Fabrication Facility: Overcoming Supplier Qualification Challenges for the Nuclear Renaissance—Panel	Safeguards, Nonproliferation, and Material Detection
<b>Eaton</b>			Nuclear Applications of Particle Accelerators: General	The Need for Nuclear Engineers with a Professional Engineering License—Papers/Panel	Training, Human Performance, and Workforce Development ----- Innovations in Nuclear Engineering Education, Training, and Distance Learning

## Condensed Schedule

ROOM	WEDNESDAY, JUNE 16, 2010		THURSDAY, JUNE 17, 2010
	8:30 AM - 11:30 AM	1:00 PM - 4:00 PM	8:30 AM - 11:30 AM
<b>Royal Palm Salon 1</b>	Radiation Protection and Shielding: General ----- Computational Resources for Radiation Modeling	The Helium-3 Shortage and the Future of Neutron Detection—Panel	Point Kernel Shielding Techniques: A Tutorial on Quads/QAD MOD
<b>Royal Palm Salon 2</b>	Advances in Safety Assessment Methods and Programs	Uranium Recovery: Reducing Environmental Impacts Through Technological Advances and Improved Operational Practices—Panel	
<b>Royal Palm Salon 3</b>	Computational Methods and Mathematical Modeling	Human Factors, Instrumentation, and Controls: General	
<b>Royal Palm Salon 4</b>	Food Irradiation—I	Food Irradiation—II—Panel	
<b>Royal Palm Salon 5</b>	Licensing of a Digital Upgrade—I	Licensing of a Digital Upgrade—II—Panel	Operations and Power: General—II ----- Advanced/Generation-IV Reactors
<b>Royal Palm Salon 6</b>	Lessons Learned in the 10CFR 52 Process: A Status Report—Panel		
<b>Windsor</b>	Scaling Analysis Techniques—Tutorial	General Thermal Hydraulics—I	General Thermal Hydraulics—II
<b>Hampton</b>	Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—I	Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—II	Nuclear Criticality Safety Standards—Forum
<b>Sheffield</b>	Reactor Analysis Methods	Reactor Physics Design, Validation, and Operating Experience	Advances in Small- and Medium-Sized Reactor Designs
<b>Brittany</b>	Solid Waste Recycling—Panel	New Developments in Advanced Fuel Cycles	Behavior and Performance of Fuels for Advanced Fuel Cycles
<b>Eaton</b>	Focus on Communications: Credibility in a Digital Age—Panel	Focus on Communications: Keeping Nuclear Communications Relevant—Panel	

# Technical Sessions by Day: Monday

## MONDAY • JUNE 14, 2010

7:30 AM – 5:00 PM	MEETING REGISTRATION
8:00 AM – 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM – 11:30 AM	<b>2010 ANS ANNUAL MEETING: OPENING PLENARY</b> “Nuclear Science and Technology— The Right Fit. The Right Time.”
9:30 AM – 1:30 PM	<b>SPOUSE/GUEST TOUR</b> “Vintage Vineyard Tour”
11:30 AM – 1:00 PM	<b>ATTENDEE LUNCHEON IN THE ICAPP’10 EXHIBIT</b>
11:30 AM – 1:00 PM	<b>OPERATIONS AND POWER DIVISION LUNCHEON</b>
1:00 PM – 2:30 PM	<b>2010 ANS ANNUAL MEETING: ANS PRESIDENT’S SPECIAL SESSION</b> “U.S. Engagement in the Global Nuclear Renaissance— The Path Forward”
2:30 PM – 4:00 PM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Current Topics in Radiation Protection and Shielding—Roundtable</li><li>• Environmental Sciences: General</li><li>• Operations and Power: General—I</li><li>• Hot Topics and Emerging Issues</li><li>• Computational Two-Phase Flow</li><li>• Current Issues in Computational Methods—Roundtable/Panel</li><li>• Current Issues in LWR Core Design and Reactor Engineering Support—Panel</li><li>• Hybrid Fission-Fusion Systems for Transmutation of Waste</li><li>• Nuclear Applications of Particle Accelerators: General</li><li>• Proposed Solutions for SMR Generic Licensing Issues—Panel</li></ul>
2:30 PM – 4:00 PM	<b>ICAPP’10: TECHNICAL SESSIONS</b>
2:30 PM – 5:00 PM	<b>ST-NH2: KEYNOTE AND OPENING PLENARY:</b> “Nuclear Hydrogen Programs Around the World— Current Activities and Plans”
4:00 PM – 6:00 PM	<b>ICAPP’10: OPENING PLENARY:</b> “New Nuclear Build—Perspectives from Around the World”
6:30 PM – 10:30 PM	<b>EVENING EVENT:</b> “Reception and Dinner at the USS Midway Museum”

## MONDAY, JUNE 14, 2010, 8:00 A.M.

### Opening Plenary: Nuclear Science and Technology— The Right Fit. The Right Time.

Chair: Ross T. Ridenoure (SCE)

### Golden Ballroom

#### 8:00 a.m.

##### OPENING REMARKS AND WELCOME:

- Thomas L. Sanders (President, ANS)
- Ross Ridenoure (SCE)

##### SPEAKERS:

- Gregory B. Jaczko (Chairman, NRC)
- Richard Stratford (Director, Bureau of International Security and Nonproliferation, Office of Nuclear Energy, Safety, and Security)
- Marv Fertel (NEI)
- Masaharu Hanyu (Representative Director & CEO, Hitachi-GE Nuclear Energy, Ltd.)
- Ross Ridenoure (SCE)

PRESENTATION OF SMYTH AWARD

## MONDAY, JUNE 14, 2010, 1:00 P.M.

### ANS President’s Special Session: U.S. Engagement in the Global Nuclear Renaissance—the Path Forward. Chair: Thomas L. Sanders (SNL)

### Golden Ballroom

#### 1:00 p.m.

This session will explore the steps the U.S. must take to facilitate a safe and secure global nuclear renaissance, including the deployment of advanced small modular reactors (SMRs), strengthening the U.S. domestic nuclear manufacturing infrastructure, and achieving long-term sustainability of the nuclear fuel cycle.

##### SPEAKERS:

- Thomas L. Sanders (President, American Nuclear Society)
- Craig Piercy (Washington Representative, American Nuclear Society)
- Philip Moor (Tetra Tech EC, Inc.)
- John McGaha (Entergy/Enexus)
- Audeen Fentiman (Purdue University)
- Glenn George (NERA Economic Consulting)

## MONDAY, JUNE 14, 2010, 2:30 P.M.

### Current Topics in Radiation Protection and Shielding—Roundtable, sponsored by RPSD. Session Organizer: Eric Burgett (Georgia Tech).

Chair: Eric Burgett

### Royal Palm Salon 1

#### 2:30 p.m.

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

### Environmental Sciences: General, sponsored by ESD. Session Organizer: Rebecca Steinman (Advent Eng). Chair: Rebecca Steinman

### Royal Palm Salon 3

#### 2:30 p.m.

New Meteorological Data for VENTSAR XL, Eduardo B. Farfán, Trevor Q. Foley, Erik D. Kabelá, Allen H. Weber, G. Timothy Jannik (SRNL), Elizabeth D. LaBone (Univ of South Carolina), Yanina T. Breakiron (Clemson Univ)

#### 2:55 p.m.

An Economic Comparison of Nuclear and Natural Gas for Bitumen Extraction, Julia Harvey, Erich Schneider (Univ of Texas, Austin)

#### 3:20 p.m.

Nuclear Assisted Coal and Gas to Liquids Production Analysis, Anastasia M. Gribik, Rick A. Wood (INL)

### Operations and Power: General—I, sponsored by OPD.

Chair: Art Wharton (Westinghouse)

### Royal Palm Salon 5

#### 2:30 p.m.

Vermont Yankee License Renewal and the State of Vermont’s Involvement, Bruce E. Hinkley (Beckman Assoc)

## Technical Sessions by Day: Monday

### 2:55 p.m.

Emergency Planning Considerations for Small- and Medium-Sized Reactors, Robert G. Nicholas (*Tetra Tech*)

### 3:20 p.m.

Hyperion Power Module, Safety and Operational Features for Reactor Operations, T. J. Trapp, Pete Peterson (*Hyperion Power Generation*), Pat McClure, Richard Kapernick, David Poston (*LANL*)

### 3:45 p.m.

Remote Small-Modular Helium Reactor (RS-MHR), Malcolm P. LaBar, Arkal Shenoy, Robert Schleicher (*General Atomics*)

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**Hot Topics and Emerging Issues**, sponsored by DDRD. *Session Organizer:* Nadia Glucksberg (*MACTEC, Inc.*). *Chair:* J. Mark Price (*SCE*)

### Royal Palm Salon 6

#### 2:30 p.m.

Addressing Challenging Remote-Handled Deactivation and Decommissioning Wastes at ORNL, B. D. Patton, R. T. Jubin, S. M. Robinson, K. R. Schneider, S. D. Van Hoesen (*ORNL*)

#### 2:55 p.m.

Trenchless Technologies for Minimizing Impacts for Pipeline Replacements in Radioactive Environments, K. P. Bugbee, B. D. Patton, R. T. Jubin, S. M. Robinson, N. M. Sullivan (*ORNL*)

#### 3:20 p.m.

Dismantling Nuclear Facilities for Reutilization: An Illustration on Marcoule UP1 Site, Jean-Michel Chabeuf (*AREVA NC*)

#### 3:45 p.m.

Development of Computer Program for Estimating Decommissioning Cost, Hak-Soo Kim, Tae-Won Hwang, Young-Bu Choi (*KHNP*)

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**Computational Two-Phase Flow**, sponsored by THD.

*Chair:* Donna Guillen (*INL*)

### Windsor

#### 2:30 p.m.

Three-Field Annular Flow Modeling Package—Part I: Interfacial Structure and Drag, Jeffrey W. Lane (*Penn State*), D. L. Aumiller, Jr. (*BAPL*), L. E. Hochreiter, F. B. Cheung (*Penn State*)

#### 2:55 p.m.

Three-Field Annular Flow Modeling Package—Part II: Entrainment Rate Models, Jeffrey W. Lane (*Penn State*), D. L. Aumiller, Jr. (*BAPL*), L. E. Hochreiter, F. B. Cheung (*Penn State*)

#### 3:20 p.m.

Numerical Analysis of the Effect of Two-Phase Flow Maldistribution on Heat Transfer Performance, J. C. Pacio, C. A. Dorao (*Norwegian Univ Sci Tech*)

#### 3:45 p.m.

Method of Characteristics for RELAP5 Simulations, Gaurav Shrishrimal, P. Munshi (*IIT*)

#### 4:10 p.m.

Effect of Gap Nodalization on RELAP5 Heat Conduction Calculations, Juan J. Carbajo (*ORNL*)

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**Current Issues in Computational Methods—Roundtable/Panel**, sponsored by MCD. *Session Organizer:* Farzad Rahnema (*Georgia Tech*). *Chair:* Farzad Rahnema

### Hampton

#### 2:30 p.m.

“Current Issues in Transport Theory Methods for Whole Reactor Core Criticality Analysis”

Nuclear power is a major source of electricity in many parts of the world, and it is gaining increasing amounts of attention, especially within the realm of politics. How governments, universities, small businesses, national laboratories, and commercial vendors work together will determine the future of nuclear power. The modeling and simulation of nuclear reactors requires improvements for both current and next generation reactors. This panel of scientists and engineers from commercial reactor vendors will discuss their needs for transport simulations.

#### PANELISTS:

- Farzad Rahnema (*Georgia Tech*)
- Tom Sutton (*KAPL*)
- Rene Geemert (*AREVA*)
- Boyan Ivanov (*Westinghouse*)
- Scott Palmtag (*GNF*)
- Richard Sanchez (*CEA*)
- James Donnelly (*AMEC-NSS*)
- Wei Shen (*AECL*)
- Abderrafi Ougouag (*INL*)
- Won Sik Yang (*ANL*)

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**Current Issues in LWR Core Design and Reactor Engineering Support—Panel**, sponsored by RPD. *Session Organizer:*

Moussa Mahgerefteh (*Exelon Nuclear*). *Chair:* Moussa Mahgerefteh

### Sheffield

#### 2:30 p.m.

Panel members invited from utilities and/or fuel vendors will share current core design capabilities, operating experience, methods for addressing issues impacting core designs, and associated reactor engineering support activities. Particular issues may include INPO SOER 96-02, INPO SER 03-02, reactivity management, poison management, power maneuver strategies and tools, fuel performance (cladding failures, crud-induced power shift, distinctive crud pattern, impact of primary chemistry, and Zero-by-Ten initiatives), decommissioning and spent-fuel disposal, refueling outage length, cycle length, fuel cycle cost, power uprates, and new fuel designs.

#### PANELISTS:

- Mike Reitmeyer (*Exelon*)
- Dave Hoppes (*South Texas Project*)
- Erik Mader (*EPRI*)
- David Orr (*Duke Energy*)
- Douglas Crawford (*GE Nuclear-Global Nuclear Fuel*)

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**Hybrid Fission-Fusion Systems for Transmutation of Waste**,

sponsored by FCWMD; cosponsored by FED. *Session Organizer:* James Tulenko (*Univ of Florida*). *Chair:* Wayne Meier (*LLNL*)

### Brittany

# Technical Sessions by Day: Monday/Tuesday

## 2:30 p.m.

Nearer Term Fission-Fusion Hybrids: Status and Recent Results, M. Kotschenreuther, S. Mahajan, P. Valanju, E. A. Schneider, Sid Pratap, Mike Werst, Steve Manifold, Tim Beets (*Univ of Texas, Austin*), Rob Reed (*UCLA*)

## 2:55 p.m.

The Laser Inertial Fusion Engine as a Weapons-Grade Plutonium Fuel Burner, K. J. Kramer, J. F. Latkowski, R. P. Abbott, M. Fratoni, J. J. Powers, J. E. Seifried, J. M. Taylor (*LLNL*)

## 3:20 p.m.

The Georgia Tech SABR Studies of a Fusion-Fission Hybrid Fast Burner Reactor, W. M. Stacey, C. M. Sommer, B. Petrovic, C. Stewart (*Georgia Tech*)

## 3:45 p.m.

A Conceptual Design of a Fusion-Fission Hybrid System, Yan Cao, Yousry Gohar (*ANL*)

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**Nuclear Applications of Particle Accelerators: General**, sponsored by AAD. *Session Organizer:* Phillip Ferguson (*ORNL*).  
*Chair:* Phillip Ferguson

## Eaton

### 2:30 p.m.

Laser System for Inverse Compton Scattering Gamma-Ray Source for Photofission, Yanchun Yin (*Purdue Univ*), Salime Boucher, Rodion Tikhoplav (*Radiabeam Tech*), Gil Travish (*UCLA*), Igor Jovanovic (*Purdue Univ*)

### 2:55 p.m.

Summary of Conclusions from the EUROTRANS Reactivity Monitoring Experiments at YALINA-Booster, Carl Berglöf (*KTH*), Manuel Fernández-Ordóñez, David Villamarín, Vicente Bécares, Enrique González-Romero (*CIEMAT*), Victor Bournos, Ivan Serafimovich, Sergei Mazanik, Yuri Fokov (*JIPNR*), José-Luis Muñoz-Cobo (*UPV*)

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### Proposed Solutions for SMR Generic Licensing Issues—Panel

sponsored by NISD; cosponsored by OPD. *Session Organizer:* John E. Kelly (*SNL*). *Cochairs:* Philip Moor (*Tetra Tech*), John E. Kelly

## Royal Palm Salon 2

### 2:30 p.m.

Following an NRC workshop on small- and medium-sized reactors (SMRs) in the fall of 2009, ANS President Tom Sanders formed a special committee to assess generic issues associated with licensing SMRs. The committee has identified and clarified key issues and has developed white papers that propose potential solutions for the issues. This panel session will present the results of the committee's findings.

#### PANELISTS:

- Charles Hess (*Shaw Group*)
- Jose Reyes (*NuScale*)
- Steve Atherton (*GEH*)
- Mark Campagna (*Hyperion Power Generation*)
- Robert Haemer (*Pillsbury Law*)

## TUESDAY • JUNE 15, 2010

7:30 AM – 5:00 PM **MEETING REGISTRATION**

8:00 AM – 10:00 AM **ICAPP'10: PLENARY 2:**  
"Approach to Effective and Efficient Nuclear Power Regulation"

8:00 AM – 10:00 AM **SPOUSE/GUEST HOSPITALITY**

8:15 AM – 9:50 AM **NFSM for NGNR: OPENING PLENARY**

8:15 AM – 12:00 PM **ST-NH2: TECHNICAL SESSIONS**

8:30 AM – 11:30 AM **2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS**

- Modeling and Simulation Efforts for Nuclear Nonproliferation—I
- Severe Accident Analyses for Current and Advanced Reactors
- Transport Methods: General
- Neutron Beam Technique Developments and Utilizations at Research Reactors
- Update on LWR Sustainability Program R&D Overview—Panel
- Challenges for New Plant Workforce Development and Training
- Thermal Hydraulics of VHTR
- Data, Analysis, and Operations in Nuclear Criticality Safety—I
- Reactor Physics: General—I
- MOX Fuel Fabrication Facility: Overcoming Supplier Qualification Challenges for the Nuclear Renaissance—Panel
- The Need for Nuclear Engineers with a Professional Engineering License—Papers/Panel

10:00 AM – 12:00 PM **ICAPP'10: TECHNICAL SESSIONS**

10:10 AM – 11:50 AM **NFSM for NGNR: TECHNICAL SESSIONS**

11:30 AM – 1:00 PM **ANS HONORS AND AWARDS LUNCHEON**

1:00 PM – 4:00 PM **2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS**

- Modeling and Simulation Efforts for Nuclear Nonproliferation—II
- Regulatory and Safety Analyses for Severe and Design-Basis Accidents
- Uncertainty Quantification in Nuclear System Modeling and Simulation
- Isotopes and Radiation: General
- Plant Performance After Power Uprate—Panel
- Waste Management Alternatives
- Computational Thermal Hydraulics
- Data, Analysis, and Operations in Nuclear Criticality Safety—II
- Computational Advances in Criticality Safety Analysis
- Reactor Physics: General—II
- Advances in Reactor Core Analysis Methods to Meet the Challenges of Next-Generation and Advanced NPP Designs
- Safeguards, Nonproliferation, and Material Detection
- Training, Human Performance, and Workforce Development
- Innovations in Nuclear Engineering Education, Training, and Distance Learning

1:00 PM – 4:00 PM **ICAPP'10: TECHNICAL SESSIONS**

1:00 PM – 4:25 PM **ST-NH2: TECHNICAL SESSIONS**

1:00 PM – 4:40 PM **NFSM for NGNR: TECHNICAL SESSIONS**

1:00 PM – 5:00 PM **SPOUSE/GUEST TOUR**  
"San Diego by Land and Sea"

4:00 PM – 6:00 PM **ICAPP'10: PLENARY 3:**  
"An International Outlook on Nuclear Power"

# Technical Sessions by Day: Tuesday

**TUESDAY, JUNE 15, 2010, 8:30 A.M.**

**Modeling and Simulation Efforts for Nuclear Nonproliferation—I**, sponsored by RPSD. *Session Organizer:* Michael Fensin (LANL). *Chair:* Michael Fensin

## Royal Palm Salon 1

**8:30 a.m.**

Three-Dimensional Source Localization Using Uncollimated Arrays, Adam Hecht, Tyler Alecksen (*Univ of New Mexico*)

**8:55 a.m.**

MCNPX Simulation of a Passive Prompt Gamma System to Be Used in a Spent Fuel Plutonium Assay Strategy, Michael L. Fensin, William Koehler, Stephen J. Tobin (LANL)

**9:20 a.m.**

Burnup-Dependent Neutron Source Term for Gross Neutron Detection Techniques, J. G. Richard (*Univ of Florida*), M. L. Fensin, S. J. Tobin, M. T. Swinhoe, H. O. Menlove (LANL)

**9:45 a.m.**

Delayed Neutron Measurement System for Pu Mass Determination in Spent Fuel Assembly, Tae-Hoon Lee, Howard O. Menlove, Elizabeth A. Meek, Stephen J. Tobin (LANL)

**10:10 a.m.**

Determining Plutonium Mass in Spent Fuel Using <sup>252</sup>Cf Interrogation with Prompt Neutron, Jianwei Hu, Stephen J. Tobin, Howard O. Menlove (LANL)

**10:35 a.m.**

Gate Width Optimization for Passive Neutron Albedo Reactivity Applied to the Nondestructive Assay of Spent Nuclear Fuel, L. G. Evans, S. J. Tobin, S. Croft, M. Schear (LANL)

## Severe Accident Analyses for Current and Advanced Reactors

sponsored by NISD. *Session Organizers:* Amy Hull (NRC), Stephen P. Schultz (*Consultant*). *Chair:* Phillip G. Ellison (*GE Hitachi Nuclear*)

## Royal Palm Salon 2

**8:30 a.m.**

Reliability Evaluation for the Passive Residual Heat Removal System of SMART Integral Reactor, N. C. Cho (*KINS-Korea*), I. S. Kim (*ISSA Tech*), C. J. Lee (*KINS-Korea*), Y. S. Lee (*FNC Technol*)

**8:55 a.m.**

Spray Sensitivity Study Performed with the MELCOR Code, Juan J. Carbajo (*ORNL*), Andrzej Drozd (NRC)

**9:20 a.m.**

Evaluation of the Water Spray Impact on Premixed Hydrogen-Air-Steam Flames Propagation, H. Cheikhvat, N. Chaumeix (CNRS), A. Bentaib (IRSN-France), C.-E. Paillard (CNRS)

**9:45 a.m.**

Mitigation Effect of Feed-Bleed on In-Vessel Release of Fission Products, Gaofeng Huang, Jingxi Li, Xuewu Cao (*Shanghai Jiao Tong Univ-China*)

**10:10 a.m.**

Plant-Specific Severe Accident Management Strategies Development for Pressurized Heavy Water Reactor, Y. Choi, S. Y. Park, S. D. Kim, D. H. Kim, J. H. Jin (*KAERI-Korea*)

**10:35 a.m.**

Progression of Severe Accidents in the U.S. EPR, Zhe Yuan, Mohsen Khatib-Rahbar (*Energy Research*), Imtiaz K. Madni (NRC)

**Transport Methods: General**, sponsored by MCD. *Session Organizer:* Todd Urbatsch (LANL). *Chair:* Anil Prinja (*Univ of New Mexico*)

## Royal Palm Salon 3

**8:30 a.m.**

Variable Change Technique Applied in Constrained Inverse Transport Applications, Zeyun Wu, Marvin L. Adams (*Texas A&M*)

**8:55 a.m.**

A Hybrid Differential Evolution/Levenberg-Marquardt Method for Solving Inverse Transport Problems, Keith C. Bledsoe, Jeffrey A. Favorite (LANL)

**9:20 a.m.**

A Hybrid Monte Carlo-Deterministic Method for Global Binary Stochastic Medium Transport Problems, Kendra P. Keady (*Oregon State Univ*), Patrick S. Brantley (LLNL)

**9:45 a.m.**

Enhanced Correlated Sampling by Source Biasing for Pin Diversion Analysis, Bingjing Su, Tao He (*Univ of Cincinnati*)

**10:10 a.m.**

Spatial Discretization Error Reduction in Thermal Radiative Transfer, Jesse R. Cheatham, James P. Holloway, William R. Martin (*Univ of Michigan*)

**10:35 a.m.**

Physics-Based Time Step Controller Improvements in Thermal Radiative Transfer, Jesse R. Cheatham, James P. Holloway, William R. Martin (*Univ of Michigan*)

## Neutron Beam Technique Developments and Utilizations at Research Reactors

sponsored by IRD; cosponsored by BMD. *Session Organizer:* Kenan Ünlü (*Penn State*). *Chair:* Jack Brenizer (*Penn State*)

## Royal Palm Salon 4

**8:30 a.m.**

Neutron Depth Profiling Measurements and GEANT4 Simulation Comparison for Borophosphosilicate-Glass (BPSG) Sample, D. Uçar, K. Ünlü (*Penn State*)

**8:55 a.m.**

Modeling Experimental Geometric Uncertainty Caused by Particle Straggling in Condensed Matter During Coincidence Radiation Detection Measurements, Cory L. Trivelpiece, Jack S. Brenizer (*Penn State*)

**9:20 a.m.**

Further Development of TRIGSIMS Code System for Penn State Breazeale Reactor Fuel Management, V. Karriem, F. Puente Espel, M. Avramova, B. Heidrich, K. Ünlü (*Penn State*)

# Technical Sessions by Day: Tuesday

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## 9:45 a.m.

An Assay of Uranium Ore with Compton-Suppressed Gamma Spectroscopy, S. Landsberger, S. Fitch, K. Dayman (*Univ of Texas, Austin*)

## 10:10 a.m.

The Effect of Sapphire Crystal Filter to Beam Port 4 at Penn State Breazeale Nuclear Reactor: Simulation and Measurement, D. Uçar, K. Ünlü (*Penn State*)

## 10:35 a.m.

Thermal-Hydraulic Modeling of Penn State Breazeale Reactor for Safety and Fuel Management Analysis, V. Karriem, F. Puente Espel, M. Avramova, B. Heidrich, K. Ünlü (*Penn State*)

## 11:00 a.m.

Europium Interference When Determining Trace Amounts of Nickel in Plant Samples by Neutron Activation Analysis, S. Landsberger, S. Robinson (*Univ of Texas, Austin*)

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## Update on LWR Sustainability Program R&D Overview—Panel,

sponsored by OPD. *Cochairs:* Edward Quinn (*Longenecker Assoc*), Ronaldo Szilard (*INL*)

## Royal Palm Salon 5

### 8:30 a.m.

This session will provide the latest update on the overview and status of the LWR Sustainability Program, directed by the DOE and approved by Congress to support the continued high reliability and excellent performance of the current fleet of 104 nuclear power plants in the U.S. Major R&D areas include collaborative research on advanced fuel design, instrumentation and controls, nuclear materials aging and degradation, and safety analysis. Panelists from the DOE, national labs, and industry will address the overall program and major focus areas including progress to date, ongoing activities, and major challenges to operation of our reactor fleet beyond 60 years at very high performance levels.

#### PANELISTS:

- Rich Reister (*DOE-NE*)
- John Gaertner (*EPR*)
- Garry G. Young (*Energy Nuclear*)
- Dan Naus (*ORNL*)
- Edward J. Lahoda (*Westinghouse*)
- Bruce Hallbert (*INL*)
- Bob Youngblood (*INL*)

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## Challenges for New Plant Workforce Development and Training,

sponsored by OPD. *Chair:* Mike Spellman (*Progress Energy*)

## Royal Palm Salon 6

### 8:30 a.m.

Estimating the Demand for the U.S. Nuclear Industry Workforce, Joseph C. Von Nessen, Douglas P. Woodward, Sandra J. Teel (*Univ of South Carolina*)

### 8:55 a.m.

Will the New Plant Workforce Be in Place in Time? John Lindsey (*Exelon Nuclear Partners*), Ed Baker (*ScottMadden Inc*)

## 9:20 a.m.

Managing the Uncertainty in Delivering New Plant Projects, William J. Flanagan (*Black Diamond Svc*)

## 9:45 a.m.

Operator Training Challenges for New Generation Reactors, Frank S. Tsakeres, Rob Brixey (*NWI Consulting LLC*)

## 10:10 a.m.

Instructor Development During High-Volume New Reactor Training, William W. Thompson (*TVA*)

## 10:35 a.m.

Developing the Texas Nuclear Workforce of the Future, Clarence Fenner (*STP Nucl Operating Co*)

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## Thermal Hydraulics of VHTR, sponsored by THD.

*Cochairs:* Chang Oh (*INL*), Karen Vierow (*Texas A&M*)

## Windsor

### 8:30 a.m.

Scaling Analysis for Depressurization of High-Temperature Test Facility, R. Brian Jackson, Brian Woods, Kendra Keady (*Oregon State Univ*)

### 8:50 a.m.

Scaling a Pressurized Conduction Cooldown Event in an HTGR, Brian King, Brian Woods, Jill Smith (*Oregon State Univ*)

### 9:10 a.m.

Scaling Analysis and Numerical Comparison for the Core in the High-Temperature Test Facility, Seth Cadell, Brian Woods (*Oregon State Univ*)

### 9:30 a.m.

Daily Thermal Results of the AGR-1 Experiment in the Advanced Test Reactor, Grant L. Hawkes, Richard G. Ambrosek, James W. Sterbentz, John T. Maki (*INL*)

### 9:50 a.m.

RELAP5 Loss of Flow Analysis of Deep Burn High-Temperature Prismatic Reactor Core, Hongbin Zhang, Michael Pope, Haihua Zhao (*INL*)

### 10:10 a.m.

Measurements of Graphite Particle Generation by Pebble Abrasion, Raymond S. Troy, Robert V. Tompson, Tushar K. Ghosh, Sudarshan K. Loyalka (*Univ of Missouri, Columbia*)

### 10:30 a.m.

Pressure Drop in a Pebble Bed Reactor, Changwoo Kang, E. E. Dominguez-Ontiveros, Yassin A. Hassan (*Texas A&M*)

### 10:50 a.m.

Application of PIV and POD Techniques to Reconstruct the Vorticity Fields of Jet Flows Injecting into a Rod Bundle, Noushin Amini, Yassin A. Hassan (*Texas A&M*)

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## Data, Analysis, and Operations in Nuclear Criticality Safety—I,

sponsored by NCSD. *Session Organizer:* Larry L. Wetzel (*Babcock & Wilcox*). *Chair:* Kevin Reynolds (*BWXT Y12*)

## Hampton

# Technical Sessions by Day: Tuesday

## 8:30 a.m.

Criticality Safety Design Challenges at the MOX Fuel Fabrication Facility, Michael J. Shea, Amanda C. Bryson, Robert G. Foster (*Shaw AREVA MOX Services, LLC*)

## 8:55 a.m.

Benchmark Evaluation of Uranium Metal Annuli and Cylinders with Beryllium Reflectors, John D. Bess (*INL*)

## 9:20 a.m.

Calculated Critical Masses of  $^{242m}\text{Am}$  for Unreflected Spherical Homogeneous Water Moderated Systems, Norman L. Pruvost, Donald G. Shirk, Charles T. Rombough (*CTR Tech Svc*)

## 9:45 a.m.

Monte Carlo Simulation of Fuel Pellet Spills with Axial Inter-Pellet Moderation and Stochastic Geometry, David Snopek, Qi Ao (*GE Hitachi Nuclear*)

## 10:10 a.m.

Direct Perturbation Calculation for TSUNAMI Sensitivity Coefficient Validation, Allison D. Barber (*Univ of New Mexico*), Don Mueller (*ORNL*)

## 10:35 a.m.

Validation of the SCALE Criticality Safety Codes and Data Using Reviewed Benchmark Models, S. Goluoglu (*ORNL*)

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**Reactor Physics: General—I**, sponsored by RPD. *Session Organizer:* Fausto Franceschini (*Westinghouse*). *Chair:* Blair P. Bromley (*AECL Chalk River Labs*)

## Sheffield

### 8:30 a.m.

Improving the Thermal Conductivity of  $\text{UO}_2$  Fuel with the Addition of Graphite Fibers, D. F. Hollenbach, L. J. Ott (*ORNL*)

### 8:55 a.m.

Magnesium Oxide: An Improved Reflector for Blanket-Free Fast Reactors, R. R. Macdonald, M. J. Driscoll (*MIT*)

### 9:20 a.m.

Fission Measurements in Support of Advanced Fuel Cycle Research, Fredrik Tovesson, Alexander Laptev (*LANL*), Tony S. Hill (*INL*)

### 9:45 a.m.

Empirical Diffusion Coefficients for Natural-Uranium CANDU Lattices, Amin Patel, Eleodor Nichita (*Univ of Ontario Inst of Tech*)

### 10:10 a.m.

Monte Carlo Depletion Calculation for the AGR-1 TRISO Particle Irradiation Test, James W. Sterbentz, Grant L. Hawkes, John T. Maki, David A. Petti (*INL*)

### 10:35 a.m.

Minimization of the Decay Heat in an MHR for TRU Deep-Burn, Chang Keun Jo (*KAERI-Korea*), Yonghee Kim (*UNIST*), F. Venneri (*Logos Tech*), Jae Man Noh (*KAERI-Korea*)

## 11:00 a.m.

Evaluation of Power Peaking Factor in VVER-1000 Using MCNP, K. Hadad (*Univ of Arizona*), M. Yousefnia (*Shiraz Univ*), B. D. Ganapol (*Univ of Arizona*)

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### MOX Fuel Fabrication Facility: Overcoming Supplier Qualification Challenges for the Nuclear Renaissance—Panel,

sponsored by FCWMD; in collaboration with SCNN.

*Session Organizer:* Carl A. Mazzola (*Shaw AREVA MOX Services*).

*Chair:* Carl A. Mazzola

## Brittany

### 8:30 a.m.

The Mixed Oxide Fuel Fabrication Facility is into its third year of construction at the Savannah River Site, on time and within budget, with cold startup on the horizon. As an NRC-licensed facility, significant human resource and qualified supplier barriers have been encountered, in part due to the long dormancy of nuclear facility construction. As an entry project for the budding nuclear renaissance, overcoming these barriers is of the utmost importance.

MOX Services' Gateway program, which continues to address human resource limitations, was discussed at a recent ANS meeting. This session focuses on how the need for available qualified suppliers is being addressed, providing a forum to discuss the underlying issues and to showcase a program that provides solutions.

### PANELISTS:

- Clay Ramsey (*NNSA/SR*)
- Dave Stinson (*Shaw AREVA MOX Services*)
- George Shell (*Shaw AREVA MOX Services*)
- Howard Lawrence (*Shaw AREVA MOX Services*)
- Deborah Seymour (*NRC*)

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### The Need for Nuclear Engineers with a Professional Engineering License—Papers/Panel,

sponsored by ETWDD.

*Session Organizer:* John D. Metzger (*Bechtel Marine Propulsion*).

*Chair:* John D. Metzger

## Eaton

### 8:30 a.m.

Engineering Regulation—Evolution and Function, Harold Williamson (*HEW Enterprises*)

### 8:55 a.m.

Professional Engineering Licensure: Opening Doors of Opportunity, Rebecca L. Steinman (*Advent Eng*)

### 9:20 a.m.

Professional Engineering Registration Benefits: The Profession, the Public, the Person, T. A. Groover (*Wiley/Wilson*)

# Technical Sessions by Day: Tuesday

9:45 a.m.

PANEL DISCUSSION

PANELISTS:

- Rebecca L. Steinman (*Advent Eng*)
- Harold Williamson (*HEW Enterprises*)
- Tim A. Groover (*Wiley/Wilson*)
- David W. Scott (*NCEES*)

**TUESDAY, JUNE 15, 2010, 1:00 P.M.**

## **Modeling and Simulation Efforts for Nuclear Nonproliferation—II,**

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

*Chair:* Michael Fensin

### **Royal Palm Salon 1**

1:00 p.m.

Modeling and Simulation's Role in Determining Plutonium Mass in Spent Fuel, Stephen J. Tobin, Howard O. Menlove, Martyn T. Swinhoe (*LANL*)

1:25 p.m.

Fissile Isotope Discrimination Using Differential Die-Away Self-Interrogation Technique on a Single Pin Geometry, Melissa A. Schear, Howard O. Menlove, Stephen J. Tobin, Sang Y. Lee, Louise G. Evans (*LANL*)

1:50 p.m.

Determining Fissile Content in PWR Assemblies Using a Passive Neutron Albedo Reactivity Technique, Jeremy Lloyd Conlin, Stephen J. Tobin (*LANL*)

2:15 p.m.

MCNPX NRF Library—Release 2, Gregg W. McKinney, Alex B. McKinney, John S. Hendricks, Denise B. Pelowitz, Brian J. Quiter (*LANL*)

2:40 p.m.

Delayed Gamma Instrument for Determining Plutonium Mass in Spent Nuclear Fuel, Vladimir V. Mozin, Stephen J. Tobin (*LANL*), Jasmina Vujic (*Univ of California, Berkeley*)

3:05 p.m.

Modeling Higher Resolution Scintillators for Nonproliferation, Paul Guss, Alexis Reed, Michael Reed, Sanjoy Mukhopadhyay, Ding Yuan (*Remote Sensing Lab*), Matthew Cutler, Chris Contreras, Denis Beller (*UNLV*)

## **Regulatory and Safety Analyses for Severe and Design-Basis**

**Accidents,** sponsored by NISD. *Session Organizers:* Amy Hull (*NRC*), Stephen P. Schultz (*Consultant*). *Chair:* Lawrence M. Zull (*DNFSB*)

### **Royal Palm Salon 2**

1:00 p.m.

The BEPU (Best Estimate Plus Uncertainty) Challenge in Current Licensing of Nuclear Reactors, Francesco D'Auria (*Univ of Pisa*), Nikolaus Muellner (*Univ Wien*), Oscar Mazzantini (*Nucleoelectrica Argentina*)

1:25 p.m.

Severe Accident Consequence Assessment Regulatory Guidance: A Critique, Edwin S. Lyman (*UCS*)

1:50 p.m.

Estimation of Break Sizes for Loss of Coolant Accidents Using the Adaptive Network-Based Fuzzy Inference System, Yen Hsiang Chang, Y. M. Ferng (*National Tsing Hua Univ*)

2:15 p.m.

A Probabilistic DNBR Analysis Method, Totju Totev (*ANL*), Maria Loukanova (*SAAT-UK*)

2:40 p.m.

Experimental Assessment of NDE Methods for Online Monitoring of Materials Degradation in Nuclear Power Plant Components, Pradeep Ramuhalli, Jeffrey W. Griffin, Mukul Dixit, Leonard J. Bond (*PNNL*)

## **Uncertainty Quantification in Nuclear System Modeling and**

**Simulation,** sponsored by MCD. *Session Organizers:* Tunc Aldemir

(*Ohio State*), Hany S. Abdel-Khalik (*NCSU*). *Cochairs:* Tunc Aldemir, Hany S. Abdel-Khalik

### **Royal Palm Salon 3**

1:00 p.m.

Uncertainty Methods and Approaches in Nuclear System Safety, Francesco D'Auria, Alessandro Petrucci (*Univ of Pisa*), invited

1:20 p.m.

Modeling of the Uncertainty of Nuclear Fuel Thermal Behavior, Antoine Boulouré, Christine Struzik, Fabrice Gaudier (*CEA*), invited

1:40 p.m.

Contribution of the Uncertainty Analysis Methods to the Interpretation of Nuclear Fuel Experimental Irradiations, Christine Struzik, Antoine Boulouré (*CEA*), invited

2:00 p.m.

Using Automatic Differentiation in Sensitivity Analysis of Nuclear Simulation Models, Mihai Alexe (*Virginia Tech*), Oleg Roderick, Mihai Anitescu, Jean Utke, Thomas Fanning, Paul Hovland (*ANL*), invited

2:20 p.m.

Recent Advances in Practical Information Representation and Synthesis with Applications to Nuclear Safety Issues, E. Chojnacki, J. Baccou, S. Destercke (*IRSN*), invited

2:40 p.m.

Adjoint-Based Eigenvalue Sensitivity to Geometry Perturbations, Jeffrey A. Favorite (*LANL*)

3:00 p.m.

Imprecise Probabilities as an Engineering Tool to Handle Uncertainties in Nuclear Safety Studies, E. Chojnacki, J. Baccou, S. Destercke (*IRSN*), invited

3:20 p.m.

Scenario Aggregation in Dynamic PRA Uncertainty Quantification, Diego Mandelli, Tunc Aldemir, Alper Yilmaz (*Ohio State*), invited

# Technical Sessions by Day: Tuesday

## 3:40 p.m.

Explicit Uncertainty Analysis for Tritium Breeding in a Laser Inertial Fusion Engine, Jeffrey E. Seifried (*Univ of California, Berkeley*), Ryan P. Abbott, Massimiliano Fratoni, Kevin J. Kramer, Jeffery F. Latkowski (*LLNL*), Per F. Peterson, Jeffrey J. Powers (*Univ of California, Berkeley*), Janine M. Taylor (*LLNL*)

## Isotopes and Radiation: General, sponsored by IRD.

Session Organizer: Kenan Ünlü (*Penn State*). Chair: Jack Brenizer (*Penn State*)

### Royal Palm Salon 4

#### 1:00 p.m.

Application of Pattern Recognition Technique in Neutron-Based Elemental Analysis, Alexander Barzilov, Ivan Novikov (*Western Kentucky Univ*)

#### 1:25 p.m.

Coincidence Counting Methods for Neutron Activation Analysis in Soil, S. Landsberger, S. Horne, U. Phathanapirom (*Univ of Texas, Austin*)

#### 1:50 p.m.

Neutron Fluence Measurement Using Common PNP Transistors, David L. Gallego, Shoaib Usman (*Missouri Univ Sci Tech*)

#### 2:15 p.m.

Application of Queuing Theory for Detector Dead Time Estimation, Amol Patil, Shoaib Usman, Shrikant Jarugumilli, Scott E. Grasman (*Missouri Univ Sci Tech*)

#### 2:40 p.m.

Multi-Nuclide Decay Calculation and Recent Progresses in Methodology, Ding Yuan, Paul Guss (*Remote Sensing Lab*), Evangelos Yfantis, Charles Watkins (*UNLV*), Ray Keegan (*Remote Sensing Lab*)

#### 3:05 p.m.

A Demonstration of Self-Shielding for the Analysis of Gold with Neutron Activation Analysis, S. Landsberger, K. Dayman, V. Patel (*Univ of Texas, Austin*)

## Plant Performance After Power Uprate—Panel, sponsored by OPD.

Cochairs: Tyler Schweitzer, Lauren E. N. Schweitzer (*GE Hitachi Nuclear*)

### Royal Palm Salon 5

#### 1:00 p.m.

Over the past several years, utilities have sought to improve the performance of their plants by implementing thermal power uprates. Power uprates range from 1 to 20% increase in thermal power and are achieved through modifications in instrumentation set points, hardware changes, or major balance-of-plant equipment, depending on the size of the power uprate. Many other utilities are considering this option as energy demand continues to rise. Increasing the thermal output of a nuclear power plant brings about many challenges in the operation and maintenance of the plant. This panel will discuss the lessons learned during a power uprate and how plants have adapted to new operating parameters.

## PANELISTS:

- Tim Niggel (*GEH*)
- Bob McFetridge (*WEC*)
- Nicholas Camilli (*EPR1*)
- Norman Hanley (*Shaw Power Group*)

## Waste Management Alternatives, sponsored by FCWMD.

Session Organizer: Paul Wilson (*Univ of Wisconsin, Madison*).  
Chair: Nick Tsoulfanidis (*Editor, Nuclear Technology*)

### Royal Palm Salon 6

#### 1:00 p.m.

Methodology for Identifying Critical Fuel Cycle Parameters Governing Repository Capacity, Anthony Scopatz (*Univ of Texas, Austin*), Jun Li (*Univ of North Carolina*), Man-Sung Yim (*NCSU*), Erich Schneider (*Univ of Texas, Austin*)

#### 1:25 p.m.

Performance of Deep-Burn Spent Fuel in a Geological Repository, Bret Patrick van den Akker, Joonhong Ahn (*Univ of California, Berkeley*)

#### 1:50 p.m.

Development of Cermet High-Level Waste Forms, R. T. Jubin, W. S. Aaron, C. Ausmus, E. D. Collins, V. F. de Almeida, G. D. Del Cul, J. A. Johnson, B. D. Patton, R. J. Vedder, S. L. Voit, C. F. Weber (*ORNL*)

#### 2:15 p.m.

Evaluation of Radioactive Mineralized Waste Forms for Hanford Waste Treatment Plant Secondary Waste, Charles L. Crawford, Carol M. Jantzen, Paul R. Burket (*SRNL*)

#### 2:40 p.m.

Examination of Thermal Constraints on GTCC Waste Disposal, Jun Li (*Univ of North Carolina*), Man-Sung Yim (*NCSU*), David N. McNelis (*Univ of North Carolina*)

## Computational Thermal Hydraulics, sponsored by THD.

Chair: David Aumiller (*Bechtel-Bettis*)

### Windsor

#### 1:00 p.m.

Numerical Simulation of Exiting Coolant Flow in a Pool-Type Research Reactor, Sumeet Soni, V. Eswaran, P. Munshi (*IIT*), S. Sengupta, P. K. Guchhait (*BARC-India*)

#### 1:20 p.m.

Large-Break LOCA Analysis of a Natural Circulation Reactor, Jagdish Prasad Tyagi (*IIT*), Mithilesh Kumar, H.G. Lele (*BARC-India*), P. Munshi (*IIT*)

#### 1:40 p.m.

PISO-SIMPLE-Type Algorithms for Transient Incompressible Turbulent Flows, Ivan Otic, Xu Cheng (*KIT*)

#### 2:00 p.m.

Numerical Simulation of Thermal Hydraulics of Supercritical Fluid in a 7-Rod Bundle, Hanyang Gu, Xu Cheng (*Shanghai Jiao Tong Univ*)

# Technical Sessions by Day: Tuesday

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## 2:20 p.m.

Numerical Computation of Intermittent Flow in Fuel Channel, Zhanfei Qi, Xuewu Cao (*Shanghai Jiao Tong Univ*)

## 2:40 p.m.

Analysis of BR2 Loss of Flow Test C, Constantine P. Tzanos, Benoit Dionne (*ANL*)

## 3:00 p.m.

CFD Prediction of Heat Transfer Deterioration to Supercritical Water, Henryk Anglart (*KTH*)

## 3:20 p.m.

Thermal-Hydraulic System Analysis Input Parameters Adjustment for the IRIS Reactor, Jaeseok Heo, Paul J. Turinsky, J. Michael Doster (*NCSU*)

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

sponsored by NCSU. *Session Organizer:* Larry L. Wetzel (*Babcock & Wilcox*). *Chair:* Larry L. Wetzel

### Hampton

#### 1:00 p.m.

Application of Design-Basis Accident Analysis at Sellafield, United Kingdom, James R. Rendell (*Sellafield Ltd*)

#### 1:20 p.m.

The Revised OB-1 Method for Metal-Water Systems, R. M. Westfall, R. Q. Wright (*ORNL*)

#### 1:40 p.m.

Incorporating the Adjacent Area to the IEZ Within Nuclear Criticality Accident Emergency Planning Evaluations, Peter L. Angelo (*Y-12 NSC*)

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## Computational Advances in Criticality Safety Analysis,

sponsored by NCSU. *Session Organizer:* Pran Paul (*BWXT Y-12 LLC*). *Chair:* Allison Barber (*SNL*)

### Hampton

#### 2:05 p.m.

Criticality Accident Alarm System Modeling Made Easy with SCALE 6.1, Douglas E. Peplow, Lester M. Petrie, Jr. (*ORNL*)

#### 2:25 p.m.

Reducing Errors: Developments at Sellafield to Aid the Criticality Assessor, Dominic Winstanley, Paul Hulse (*Sellafield Ltd*)

#### 2:45 p.m.

Revisiting the “K-effective of the World” Problem, Forrest B. Brown (*LANL*)

#### 3:05 p.m.

COG—Special Features of Interest to Criticality Safety Practitioners, Richard M. Buck, David P. Heinrichs, Allan W. Krass, Edward M. Lent (*LLNL*)

## 3:25 p.m.

Bias Assessment of  $^{233}\text{U}$  Systems Using a SCALE TSURFER, Bradley T. Rearden, Don Mueller (*ORNL*)

*NOTE: This session will immediately follow the preceding session, which will begin at 1:00 p.m.*

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## Reactor Physics: General—II, sponsored by RPD. *Session Organizer:*

Fausto Franceschini (*Westinghouse*). *Chair:* Blair P. Bromley (*AECL Chalk River Labs*)

### Sheffield

#### 1:00 p.m.

MCNP Calculations of Subcritical Fixed Source and Fission Multiplication Factors, Brian C. Kiedrowski, Forrest B. Brown (*LANL*)

#### 1:25 p.m.

Comparison of Resonance Parameter Covariance Generation Using CONRAD and SAMMY Computer Codes, L. Leal (*ORNL*), C. De Saint Jean, G. Noguere (*CEA*)

#### 1:50 p.m.

Generation of Graphite Thermal Neutron Scattering Libraries Using Classical Molecular Dynamics, B. D. Hehr, A. I. Hawari, V. H. Gillette (*NCSU*)

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## Advances in Reactor Core Analysis Methods to Meet the Challenges of Next-Generation and Advanced NPP Designs,

sponsored by RPD. *Session Organizer:* Mark DeHart (*ORNL*). *Chair:* Blair P. Bromley (*AECL Chalk River Labs*)

### Sheffield

#### 2:20 p.m.

Improved Capabilities of Whole-Core Transport Code DeCART for Prismatic VHTR Analysis, Changho Lee, Won Sik Yang (*ANL*), Yeon Sang Jung (*Seoul Natl Univ–Korea*)

#### 2:45 p.m.

MCNP5 Analysis of the Fort St. Vrain High-Temperature Gas-Cooled Reactor, Benjamin R. Betzler, William R. Martin, John C. Lee (*Univ of Michigan*)

#### 3:10 p.m.

Comparison of CPM-3 Thorium Pin Cell Benchmark with Other Computer Codes, Adam Hoffman, John Lee (*Univ of Michigan*)

#### 3:35 p.m.

Coupled Nuclear-Thermal-Hydraulic Calculations for VHTRs, Gokhan Yesilyurt (*ORNL*), Kaushik Banerjee (*Holtec*), Etienne de Villèle (*AREVA*), John C. Lee, William R. Martin (*Univ of Michigan*)

*NOTE: This session will immediately follow the preceding session, which will begin at 1:00 p.m.*

## Technical Sessions by Day: Tuesday/Wednesday

**Safeguards, Nonproliferation, and Material Detection**, sponsored by FCWMD; in collaboration with SCNN. *Session Organizers:* John Gunning (ORNL), Prasad Kadambi (Consultant), John Dewes (SRNL). *Chair:* John Gunning

### Brittany

#### 1:00 p.m.

Design and Characterization of the Uranium Cylinder Assay System, Karen A. Miller, Martyn T. Swinhoe, Johnna Marlow, Howard O. Menlove, Carlos D. Rael (LANL), Tomonori Iwamoto, Takayuki Tamura, Syun Aiuchi (JNFL–Japan)

#### 1:20 p.m.

Safeguards Verification with a Fissile Mass Flow Monitor in Gas Centrifuge Enrichment Plants, Taner Uckan, Jose March-Leuba, John Gunning (ORNL)

#### 1:40 p.m.

An Inverse Method for Locating a Radioactive Source Using a Distributed Array of Detectors, Karen A. Miller, William S. Charlton (Texas A&M)

#### 2:00 p.m.

Time-Dependent Simulation of Neutron Detector Response, S. Prasad, S. D. Clarke, S. A. Pozzi, E. W. Larsen (Univ of Michigan)

#### 2:20 p.m.

The Next-Generation Safeguards Professional Network, Patrick D. Lynch, Alena V. Zhernosek, Mark D. Laughter, Jessica L. White (ORNL)

#### 2:40 p.m.

Benchmarking UK National Nuclear Laboratory's Proliferation Resistance Assessment Methodology, Kevin W. Hesketh, Andrew Worrall (NNL-UK)

#### 3:00 p.m.

Nonproliferation Infrastructure—Promoting Safety, Security, and Safeguards Through International Engagement, Jarrod Olson, Sarah Frazar, Carol Kessler (PNNL)

#### 3:20 p.m.

Identification of Adequate Proliferation Resistance for a Closed Fuel Cycle, Emory D. Collins, Michael H. Ehinger (ORNL)

### Training, Human Performance, and Workforce Development

sponsored by ETWDD. *Session Organizer:* John Wheeler (Entergy). *Chair:* John Wheeler

### Eaton

#### 1:00 p.m.

Regional Nuclear Workforce Development in the Central Savannah River Area, Susan A. Winsor (Aiken Tech College), Mindy Mets (SRS Community Reuse Org)

#### 1:25 p.m.

Knowledge Transfer and Peer Mentoring at SONGS, Pauline Alten (San Onofre Nucl Gen Station)

#### 1:50 p.m.

Training on Scaling, Uncertainty, 3-D Coupled Calculations in Nuclear Technology, Alessandro Petruzzi, Francesco D'Auria (Univ of Pisa), Tomislav Bajs (Univ of Zagreb), Francesc Reventos (Tech Univ of Catalonia)

### Innovations in Nuclear Engineering Education, Training, and Distance Learning

sponsored by ETWDD.

*Session Organizer:* J. Wesley Hines (Univ of Tennessee).

*Chair:* Peter F. Caracappa (RPI)

### Eaton

#### 2:20 p.m.

An Assessment of a Game-Like 3-D Model for Training at NPPs, Zachary Kriz, Hsingtzu Wu, Cody Aaron Morrow, Carl Rytch, Lewis Conley (Univ of Illinois), Russell Prochaska (Cornell College), Cesar Vasquez, Rizwan-uddin (Univ of Illinois)

#### 2:45 p.m.

New Control Console for the Idaho State University AGN-201 Nuclear Reactor, Daniel E. Montenegro (Univ of Missouri, Columbia), John S. Bennion (GE Hitachi Nuclear)

#### 3:10 p.m.

Meeting Future Workforce Training Needs: Development of Online Nanotechnology and Power Systems Program Concentrations, J. LeClair (Excelsior Coll), S. Anwar (Penn State), C. Snead (Excelsior Coll)

*NOTE: This session will immediately follow the preceding session, which will begin at 1:00 p.m.*

### WEDNESDAY, JUNE 16, 2010, 8:30 A.M.

#### Radiation Protection and Shielding: General

sponsored by RPSD. *Session Organizer:* Charlotta Sanders (UNLV). *Chair:* Pushpa Wijesinghe (Arizona State Univ)

### Royal Palm Salon 1

#### 8:30 a.m.

Monte Carlo Modeling for Multivariate Optimization of Transformational Neutron Detectors, Martin R. Williamson, Indraneel Sen, Alex Green, Dayakar Penumadu, L. F. Miller (Univ of Tennessee)

#### 8:55 a.m.

Prototype Neutron Energy Spectrometer, Stephen Mitchell (Remote Sensing Lab, Nellis), Sanjoy Mukhopadhyay, Richard Maurer, Ronald Wolff (Remote Sensing Lab, Andrews)

#### 9:20 a.m.

New Radiation Protection Material from the Recycling Materials, Zeev Shayer (CSM)

# Technical Sessions by Day: Wednesday

## WEDNESDAY • JUNE 16, 2010

7:30 AM – 5:00 PM	<b>MEETING REGISTRATION</b>
8:00 AM – 10:00 AM	<b>ICAPP'10: PLENARY 4:</b> “Emerging and Future LWR Designs”
8:00 AM – 10:00 AM	<b>SPOUSE/GUEST HOSPITALITY</b>
8:30 AM – 11:20 AM	<b>ST-NH2: TECHNICAL SESSIONS</b>
8:30 AM – 11:30 AM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Radiation, Protection and Shielding: General</li><li>• Computational Resources for Radiation Modeling</li><li>• Advances in Safety Assessment Methods and Programs</li><li>• Computational Methods and Mathematical Modeling</li><li>• Food Irradiation—I</li><li>• Licensing of a Digital Upgrade—I</li><li>• Lessons Learned in the 10CFR 52 Process: A Status Report—Panel</li><li>• Scaling Analysis Techniques—Tutorial</li><li>• Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—I</li><li>• Reactor Analysis Methods</li><li>• Solid Waste Recycling—Panel</li><li>• Focus on Communications: Credibility in a Digital Age—Panel</li></ul>
8:30 AM – 11:30 AM	<b>NFSM for NGNR: TECHNICAL SESSIONS</b>
10:00 AM – 12:00 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b>
11:30 AM – 1:00 PM	<b>MSTD AWARDS LUNCHEON</b>
1:00 PM – 4:00 PM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• The Helium-3 Shortage and the Future of Neutron Detection—Panel</li><li>• Human Factors, Instrumentation, and Controls: General</li><li>• Food Irradiation—II—Panel</li><li>• Licensing of a Digital Upgrade—II—Panel</li><li>• General Thermal Hydraulics—I</li><li>• Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—II</li><li>• Reactor Physics Design, Validation, and Operating Experience</li><li>• New Developments in Advanced Fuel Cycles</li><li>• Focus on Communications: Keeping Nuclear Communications Relevant—Panel</li><li>• Uranium Recovery: Reducing Environmental Impacts Through Technological Advances and Improved Operational Practices—Panel</li></ul>
1:00 PM – 4:00 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b>
1:00 PM – 4:20 PM	<b>NFSM for NGNR: TECHNICAL SESSIONS</b>
1:30 PM – 4:25 PM	<b>ST-NH2: TECHNICAL SESSIONS</b>
4:00 PM – 6:00 PM	<b>ICAPP'10: PLENARY 5:</b> “Global Nuclear Energy Opportunities and Obstacles”
4:15 PM – 5:15 PM	<b>ANS BUSINESS MEETING</b>
4:30 PM – 6:30 PM	<b>FOCUS ON COMMUNICATIONS WORKSHOP</b>
6:00 PM – 10:30 PM	<b>EVENING EVENT</b> “Dinner Cruise on the Hornblower”
7:00 PM – 9:00 PM	<b>NFSM for NGNR: POSTER SESSION</b>

**Computational Resources for Radiation Modeling**, sponsored by RPSD. *Session Organizer:* Charlotta Sanders (UNLV).  
*Chair:* Pushpa Wijesinghe (Arizona State Univ)

### Royal Palm Salon 1

#### 10:15 a.m.

Uncertainties in Dose Calculations in Mixed Radiation Field Using Point-Like Detector Option in the MCNPX Code, Maritza R. Gual (InSTEC), Héctor R. Vega-Carrillo (Univ Autonoma de Zacatecas), Massimo Zucchetti (MIT), Felix Mas (Univ of Sao Paulo—Brazil)

#### 10:40 a.m.

A Comparative Analysis of MicroShield and RadSrc Libraries, Olga Belousova, R. T. Perry, Daniel A. Gonzalez, Garry Schramm (LANL)

*NOTE: This session will immediately follow the preceding session, which will begin at 8:30 a.m.*

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**Advances in Safety Assessment Methods and Programs**, sponsored by NISD. *Session Organizers:* Amy Hull (NRC), Stephen P. Schultz (Consultant).  
*Chair:* Anthony J. Cappucci (URS Corp)

### Royal Palm Salon 2

#### 8:30 a.m.

IAEA Safety Assessment Competency and Capacity Building Initiatives, S. M. Modro, M. El-Shanawany, M. Mellinger-Deroy (IAEA—Austria)

#### 8:55 a.m.

Current IAEA Activities in Support of IRIDM and PSA, Artur Lyubarskiy, John Fraser Preston, Irina Kuzmina (IAEA—Austria)

#### 9:20 a.m.

The Effects of ESFAS STI Extension on the Unavailability of ESF Actuated Components, Yoon-Hwan Lee, Seung-Cheol Jang (KAERI—Korea)

#### 9:45 a.m.

Optimizing Transportation Parameters to Minimize the Risk of Hazardous Shipments, Barbara H. Dolphin, William D. Richins, Stephen R. Novascone (INL)

#### 10:10 a.m.

Development of Age-Dependent Failure Models for Incorporation into Existing NPP PRAs, Peter P. Lowry, Stephen D. Unwin, Michael Y. Toyooka (PNNL)

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**Computational Methods and Mathematical Modeling**, sponsored by MCD. *Session Organizer:* Patrick Brantley (LLNL).  
*Chair:* Jeffrey A. Favorite (LANL)

### Royal Palm Salon 3

#### 8:30 a.m.

Some Considerations on Stochastic Neutron Populations, Anil K. Prinja (Univ of New Mexico), Francisco J. Souto (LANL)

#### 8:55 a.m.

The Probability of Initiation in MCNP, Michael E. Rising (Univ of New Mexico), Forrest B. Brown (LANL), Anil K. Prinja (Univ of New Mexico)

#### 9:20 a.m.

Simulation of Droplet Dynamics with Mass Transfer Using the Balanced-Force Volume Tracking Algorithm for Fuel Reprocessing, Marianne M. Francois, Neil N. Carlson (LANL)

#### 9:45 a.m.

A New Multiscale Approach to Nuclear Fuel Simulations: Atomistic Validation of Kinetic Method, Z. Insepov, J. Rest, G. L. Hofman, A. Yacout (ANL), G. E. Norman, S. A. Starikov, V. V. Stegailov (JIHT—Russia)

## Technical Sessions by Day: Wednesday

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### Food Irradiation—I, sponsored by BMD; cosponsored by AAD.

*Session Organizers:* Joseph Butterweck (*Aerospace and Environmental Medicine Group*), Rolf Zeisler (*NIST*). *Chair:* Joseph Butterweck. All invited

#### Royal Palm Salon 4

##### 8:30 a.m.

Irradiation to Control Quarantine Insects in Exported Fresh Commodities: Pioneering Generic Doses, Peter A. Follett (*USDA-ARS*)

##### 8:55 a.m.

Irradiation in Combined Treatments and Food Safety, Monique Lacroix (*INRS-Institut Armand-Frappier*)

##### 9:20 a.m.

A Mobile Food Irradiation Facility to Address Emergency Food Contamination Issues, Brenden Mervin, John Brittingham, David Debo, Peter Fanno (*Univ of Tennessee*)

##### 9:45 a.m.

Regulatory Update—Food Irradiation, Lane A. Highbarger (*FDA*)

##### 10:10 a.m.

Food Irradiation in the United States: Empowering Food Industry Decision Makers, Suresh D. Pillai (*Texas A&M*)

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### Licensing of a Digital Upgrade—I, sponsored by OPD.

*Chair:* Scott Patterson (*PG&E*)

#### Royal Palm Salon 5

##### 8:30 a.m.

Licensing of the Oconee Nuclear Station Digital Protection System, Michael E. Bailey, Robert L. Gill, E. Boyd Shingleton (*Duke Energy*)

##### 8:55 a.m.

Wolf Creek's Single Platform Safety I&C Architecture, Gregg Clarkson (*Wolf Creek Nuclear Operating Corp*)

##### 9:20 a.m.

Developing Licensable FPGA-Based Safety Systems, Joseph G. Murray, Sean M. Smith (*Lockheed Martin*)

##### 9:45 a.m.

Maintaining the Qualification of an I&C Platform, Steve Seaman, Dan Stiffler (*Westinghouse*)

##### 10:10 a.m.

The 10 CFR 50.59 Rule and EPRI TR-102348/NEI 01-01—Lessons Learned, Edward L. Quinn (*Longenecker Assoc*)

##### 10:35 a.m.

Pilot Plant Experience with Interim Staff Guidance #6—Licensing Process, Scott B. Patterson (*PG&E*), John W. Hefler (*Altran*)

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### Lessons Learned in the 10CFR 52 Process: A Status Report—Panel,

sponsored by OPD. *Cochairs:* Edward Quinn (*Longenecker Assoc*), Prasad Kadambi (*Consultant*)

#### Royal Palm Salon 6

##### 8:30 a.m.

This session will provide the latest update by utilities and the NRC on using the 10 CFR 52 licensing process for new reactor licensing in the U.S. Speakers from major utilities in the lead for deployment of new designs and responsible for combined operating licensing applications as reference plants (COLA-R) will provide an overview of the process and the major challenges to date. The NRC will also address the progress, ongoing actions, and path forward to issue COLA-R for the first plants, as well as the transition into the construction phase in the U.S.

#### PANELISTS:

- D. Matthews (*NRC*)
- G. Gibson (*UniStar*)
- J. Crenshaw (*NRG/South Texas*)
- Michael Melton (*Westinghouse*)
- Peter Hastings (*Duke Energy*)

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### Scaling Analysis Techniques—Tutorial, sponsored by THD.

*Cochairs:* Pradip Saha (*GE Hitachi Nuclear*), Jose Reyes (*Oregon State Univ*)

#### Windsor

##### 8:30 a.m.

This tutorial provides a technical overview of the scaling methodology for application to nuclear power reactors, particularly light water reactors (LWRs). Three basic paths of scaling analysis—i.e., dimensional analysis, method of similitude, and normalization of governing equations—are reviewed. Examples from both single-phase and two-phase flows are discussed. Traditional scaling approach for integral test facility design, including the power/volume scaling, is discussed in light of the present approach of hierarchical two-tiered scaling (H2TS). Design and scaling of various test facilities applicable to study the transient behavior, e.g., loss-of-coolant accident, of both boiling water reactors (BWRs) and pressurized water reactors (PWRs) are discussed. Governing nondimensional scaling parameters are derived and their relative importance is established. Applicability of test data obtained from earlier test facilities is examined for the upgraded or modified reactor designs. The tutorial is geared to enhance physical understanding of the present scaling principles and should be useful for designing more effective test facilities to study the transient phenomena expected in the newer reactor designs and for new scenarios not studied earlier.

#### PANELISTS:

- Pradip Saha (*GE Hitachi*)
- Jose N. Reyes (*Oregon State Univ*)

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### Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—I, sponsored by NCS&D. *Session Organizer:* Robert Wilson

(*DOE*). *Chair:* Fitz Trumble (*WSMS*)

#### Hampton

##### 8:30 a.m.

This two-part tutorial will feature methods commonly used to identify criticality accident scenarios in nuclear operations for disposition in criticality safety evaluations.

# Technical Sessions by Day: Wednesday

Panelists will discuss the strengths and weaknesses of various hazard analysis techniques and will present principles of using these methods, along with various examples of reasonable application of the methods to plant nuclear operations. Instructors from several NCS programs will participate.

## PANELISTS:

- Bob Wilson (*DOE*)
- Julie Johnston (*LANL*)
- Tony Marth (*LANL*)
- Chris Dean (*Nuclear Safety Assoc*)
- Kevin Kimball (*Isotek*)

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**Reactor Analysis Methods**, sponsored by RPD; cosponsored by MCD. *Session Organizer:* Fausto Franceschini (*Westinghouse*).  
*Chair:* Andrew Worrall (*NNL*)

## Sheffield

### 8:30 a.m.

Performance and Convergence Issue of Coarse-Mesh Methods for Diffusion Calculations, Song Han, Sandra Dulla, Piero Ravetto (*Politecnico di Torino-Italy*)

### 8:50 a.m.

Overlap Local/Global Iteration Framework for Monte Carlo/Diffusion Nodal Calculations, Nam Zin Cho, Sunghwan Yun, Jaejun Lee (*KAIST*)

### 9:10 a.m.

Nonlinear Coarse Mesh Transport Using the Jacobian-Free Newton-Krylov Method, J.A. Roberts, B. Forget (*MIT*)

### 9:30 a.m.

A Resonance Integral Table-Based Iteration Method for Resonance Treatment in Lattice Calculations, Ser Gi Hong, Kang-Seog Kim, Jae Seung Song (*KAERI-Korea*)

### 9:50 a.m.

Comparison of Krylov and p-Multigrid Solutions of Orthogonal Response Matrix Equations, E. E. Lewis (*Northwestern Univ*), A. Wollaber, A. Marin-Lafleche, M. A. Smith, W. S. Yang (*ANL*)

### 10:10 a.m.

Response Matrix Acceleration Methods Based on Orthogonalization and Domain Decomposition, E. E. Lewis (*Northwestern Univ*), A. Wollaber, A. Marin-Lafleche, M. A. Smith, W. S. Yang (*ANL*)

### 10:30 a.m.

Development of a 1D Boiling Water Reactor Benchmark Specification, Steven Douglass, Farzad Rahnema (*Georgia Tech*)

### 10:50 a.m.

Development of a 1D Pressurized Water Reactor Benchmark Specification, Steven Douglass, Farzad Rahnema (*Georgia Tech*)

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**Solid Waste Recycling-Panel**, sponsored by FCWMD. *Session Organizer:* Paul Murray (*AREVA*). *Chair:* Paul Murray

## Brittany

### 8:30 a.m.

A panel of domestic and international experts has been assembled to discuss key technical and regulatory topics related to the generation, treatment, and stabilization of high-level waste as it relates to their countries and waste sources.

The panel will begin with a discussion of waste generated as part of the U.S. DOE Defense cleanup program followed by discussions of waste related to recycling of used nuclear fuel in Japan, the United Kingdom, and France. Panel members will discuss topics related to their areas of expertise and, where possible, will discuss current technology, lessons learned, and planned technology innovation currently under investigation.

## PANELISTS:

- Steve Schneider (*DOE-EM*)
- Pascal Prud'Homme (*AREVA La Hague*)
- Eiji Ochi (*JNF Rokkasho Reprocessing Plant*)
- Christopher Phillips (*Energy Solutions*)
- Andrew Kadak (*NWTRB*)
- Robert Jubin (*ORNL*)
- Kelli Markham (*NRC*)
- Patrick Schwab (*DOE-NE*)

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## Focus on Communications: Credibility in a Digital Age-Panel,

sponsored by ETWDD. *Session Organizer:* Teri Ehresman (*INL*).  
*Chair:* Teri Ehresman

## Eaton

### 8:30 a.m.

Online publishing serves audiences in new and meaningful ways. Journalists and their readers both have important responsibilities to explore that potential. In efforts to promote objective science coverage, journalists and public affairs officers work to help others report news responsibly and to consume information critically. This panel of newsmakers reveals strategies for evaluating the credibility of sources, segregating spin from science, and educating diverse audiences on complex subjects.

## PANELISTS:

- Gil Alexander (*SCE Corp Comm*)
- Michael Burge (*San Diego Union-Tribune*)
- Paul Sisson (*North County Times*)
- Amy Lientz (*INL*)
- Kimberly Kasitz (*General Atomics*)

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## WEDNESDAY, JUNE 16, 2010, 1:00 P.M.

### The Helium-3 Shortage and the Future of Neutron Detection-Panel,

sponsored by RPSD. *Session Organizer:* John D. Court (*ODATSD-NCB/INM*). *Chair:* John D. Court

## Royal Palm Salon 1

### 1:00 p.m.

Within the past year, the U.S. government has recognized the acute shortage of a material very important to the neutron detection community. Helium-3 is the gas of choice for neutron proportional counters in the world today.

## Technical Sessions by Day: Wednesday

This panel, consisting of members from the Department of Defense, Department of Energy, Domestic Nuclear Detection Office, National Laboratories, and National Security Staff will discuss the shortage and its history, the steps taken in the past year to deal with the shortage, and the future government policies and actions to address this critical need.

### PANELISTS:

- COL Julie A. Bentz (*National Security Staff*)
- Gregory C. Slovik (*Domestic Nuclear Detection Office*)
- Joseph Glaser (*DOE/NNSA Office for Counterterrorism, NA-4*)
- William L. Myers (*LANL*)

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**Human Factors, Instrumentation, and Controls: General**, sponsored by HFICD. *Session Organizer:* Tyrone Tonkinson (*Energy*).  
*Chair:* Richard T. Wood (*ORNL*)

### Royal Palm Salon 3

#### 1:00 p.m.

Sliding Mode Estimation of Nuclear Systems—Point Reactor Model, Günyaz Ablay, Tunc Aldemir (*Ohio State*)

#### 1:25 p.m.

Sliding Mode Estimation of Nuclear Systems—U-Tube Steam Generator, Günyaz Ablay, Tunc Aldemir (*Ohio State*)

#### 1:50 p.m.

Feature Extraction for Data-Driven Fault Detection in Nuclear Power Plants, Xin Jin, Robert M. Edwards, Asok Ray (*Penn State*)

#### 2:15 p.m.

Situation Assessment Model for Nuclear Power Plant Operators and Its Application, Hyun-Chul Lee (*KAERI-Korea*), Poong-Hyun Seong (*KAIST*)

#### 2:40 p.m.

Pulsed Eddy Current System for Monitoring the Wall Thinning of the Pipeline Covered with Insulator, D. G. Park, C. S. Angani, G. D. Kim, Y. M. Cheong (*KAERI-Korea*)

#### 3:05 p.m.

Nuclear Power Plant Productivity Improvement Opportunities with Extended Operating Life, Joseph A. Naser (*EPRI*)

#### 3:30 p.m.

NDMAS: Overview and Technical Details, Sam Alessi (*INL*)

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**Food Irradiation—II-Panel**, sponsored by BMD; cosponsored by AAD. *Session Organizers:* Joseph Butterweck (*Aerospace and Environmental Medicine Group*), Rolf Zeisler (*NIST*). *Chair:* Lane A. Highbarger (*FDA*)

### Royal Palm Salon 4

#### 1:00 p.m.

### PANELISTS:

- The 12 Misconceptions About Food Irradiation, Joseph Butterweck (*Aerospace and Environmental Medicine Group*)
- Food Irradiation: A Case Study of Implementation in Mexico, Arved G. Deecke (*PHYTOSAN SA de CV*)
- Food Irradiation: Use in Developing Countries, Sheldon Landsberger (*Univ of Texas*)
- Food Irradiation as a “Kill-Step Intervention” to Protect Consumers Against Foodborne Illness and Harmful Insects, Harlan E. Clemmons (*Sadex Corp*)
- Practical Considerations for Food Irradiation Facilities Using Electron Beam and X-Ray Technologies, Arnold Herer (*IBA Industrial*)

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**Licensing of a Digital Upgrade—II-Panel**, sponsored by OPD. *Cochairs:* Edward Quinn (*Longenecker Assoc*), William Kemper (*NRC*)

### Royal Palm Salon 5

#### 1:00 p.m.

Licensing a digital upgrade has been a challenge from the beginning and is the main reason for Task Working Group #6. Guidance has not been clear on what information is needed for the NRC to determine reasonable assurance. This panel session will allow time for a detailed discussion of lessons learned from the NRC’s standpoint, the utility’s standpoint, and the vendor’s standpoint. Presenters from the paper session will serve as panelists and will be available for answering questions.

### PANELISTS:

- Mike Bailey (*Duke Energy Carolinas*)
- Greg Clarkson (*Rock Creek Technologies*)
- Sean Smith (*Lockheed Martin*)
- Steve Seaman (*Westinghouse*)
- Edward L. Quinn (*Technology Resources*)
- Steve Wyman (*NRC*)
- John W. Hefler (*Altran Corp*)
- Norbert Carte (*NRC*)

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**General Thermal Hydraulics—I**, sponsored by THD.

*Cochairs:* Jeffrey Lane (*Bechtel-Bettis*), Jovica Riznic (*CNSC*)

### Windsor

#### 1:00 p.m.

CHF Enhancement in Flow Boiling Using Al<sub>2</sub>O<sub>3</sub> Nano-Fluid and Al<sub>2</sub>O<sub>3</sub> Nano-Particle Deposited Tube, Tae Il Kim, Won Joon Chang, Soon Heung Chang (*KAIST*)

#### 1:20 p.m.

Gas Void Fraction Determination Using an Innovative Two-Point Correlation Method, Stuart A. Walker, Arthur E. Ruggles (*Univ of Tennessee*)

# Technical Sessions by Day: Wednesday

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## 1:40 p.m.

S-RELAP5 Best-Estimate Medium-Break LOCA Analysis for US EPR™ Plant, Shih-Ping Kao, Liliane Schor (*AREVA*)

## 2:00 p.m.

Assessment of Two-Phase Critical Models Performance in RELAP5 and TRACE Against Marviken Critical Flow Test, Lukasz Sokolowski, Tomasz Kozlowski (*KTH*)

## 2:20 p.m.

Impact of Power Uprate on BWR Thermal-Hydraulic Safety Margins, Francis Bolger, Timothy Niggel, Randall Jacobs, Curt Robert, Weimin Dai (*GE Hitachi Nuclear*)

## 2:40 p.m.

Investigation of Intermittent Flow Heat Transfer in Horizontal Fuel Channel, Jingtian Yuan, Lili Tong, Xuewu Cao (*Shanghai Jiao Tong Univ-China*)

## 3:00 p.m.

Predictability of Boron Transport Phenomenon in PWR Based on PKL Experimental Program, Alessandro Del Nevo, Francesco D'Auria (*Univ of Pisa*)

## 3:20 p.m.

On the Cooling Technology of Nuclear Power Plants, Xia Wang (*Ohio State*), Hongbin Zhang (*INL*), Xiaodong Sun (*Ohio State*)

## 3:40 p.m.

Improvements to Reactor, Power, and Control Simulation (RPCSIM) Model Components, M. Carlson, S. Wright, R. Radel (*SNL*)

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**Hazard Analysis of Nuclear Criticality Safety Evaluations—Tutorial—II**, sponsored by NCS. *Session Organizer:* Robert Wilson (*DOE*). *Chair:* Fitz Trumble (*WSMS*)

## Hampton

### 1:00 p.m.

This two-part tutorial will feature methods commonly used to identify criticality accident scenarios in nuclear operations for disposition in criticality safety evaluations. Panelists will discuss the strengths and weaknesses of various hazard analysis techniques and will present principles of using these methods, along with various examples of reasonable application of the methods to plant nuclear operations.

Instructors from several NCS programs will participate.

#### PANELISTS:

- Ray Reed (*URS SMS*)
- Todd Taylor (*Bechtel BWXT Idaho*)
- Randy Shackelford (*NFS*)
- Michael Shea (*Shaw AREVA MOX Services*)
- Fred Winstanley (*Sellafield*)

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**Reactor Physics Design, Validation, and Operating Experience**, sponsored by RPD. *Session Organizer:* Fausto Franceschini (*Westinghouse*). *Chair:* Benoit Forget (*MIT*)

## Sheffield

## 1:00 p.m.

RERTR Fuel Plate Fission Power Deposition Estimation in ATR by MCNP Method, G. S. Chang (*INEL*)

## 1:25 p.m.

The Use of Perturbation Theory to Augment Advanced Test Reactor Modeling Capabilities, Joshua Peterson, Erich Schneider (*Univ of Texas, Austin*)

## 1:50 p.m.

Preservation of FFTF Data Related to Passive Safety Testing, David W. Wootan, Scott Butner, Ronald P. Omberg (*PNNL*), Bruce J. Makenas (*Mission Support Alliance*), Deborah L. Nielsen (*Indian Eyes LLC*)

## 2:15 p.m.

Assessment of Fuel Manufacturing Uncertainty Effect on NRAD Reactor Criticality, Hangbok Choi, John Bolin, Anthony Veca (*General Atomics*)

## 2:40 p.m.

HFIR Post-Irradiation Curium Target Rod Nuclide Inventory Calculations, David Chandler (*Univ of Tennessee*), R. T. Primm III (*ORNL*), G. Ivan Maldonado (*Univ of Tennessee*)

## 3:05 p.m.

Recent Reload Design Experience of Digital PWR in Korea, Il Tak Woo, Hye Young Jun, Chae Joon Lim, Sang Rin Shon (*KNFC-Korea*), R. P. Harris, J. A. Brown (*Westinghouse*)

## 3:30 p.m.

Introduction of the Core Model Simulating Load-Follow Operation, Tae Young Choi, Hag-Joon Kim, Manseok Do, Jung-Kil Kang, Kang-Hee Lee (*KNFC-Korea*)

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**New Developments in Advanced Fuel Cycles**, sponsored by FCWMD. *Session Organizer:* Paul Wilson (*Univ of Wisconsin, Madison*). *Chair:* Terry Todd (*INL*)

## Brittany

### 1:00 p.m.

Development of an Analytical Fuel Cycle Model, Raphaël Craplet, Joonhong Ahn (*Univ of California, Berkeley*)

### 1:25 p.m.

Fuel Cycle Characteristics and Energy Policy Impacts of the Energy Multiplier Module (EM2) Reactor, Robert W. Schleicher, Timothy C. Bertch, Kenneth R. Schultz (*General Atomics*)

### 1:50 p.m.

Comprehensive Recycling of Used Nuclear Fuel—A Practical Alternative, G. D. Del Cul, E. D. Collins, R. T. Jubin, J. E. Rushton (*ORNL*)

### 2:15 p.m.

Environmental Performance Analysis for the Korean Advanced Nuclear Fuel Cycle Concept, Jihae Yoon, Joonhong Ahn (*Univ of California, Berkeley*)

# Technical Sessions by Day: Wednesday/Thursday

**2:40 p.m.**

The DUROX Process: A Method to Reprocess Spent Nuclear Fuel, Chad M. Cramer (*NRC*), Brent C. Shroy (*Battelle*)

**3:05 p.m.**

Uranium Resources for the Global Nuclear Renaissance, James L. Buelte (*PNNL*), Gary Cereface (*UNLV*)

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## Focus on Communications: Keeping Nuclear Communications Relevant—Panel, sponsored by ETWDD.

Session Organizer: Teri Ehresman (*INL*). Chair: Dave Pointer (*ANL*)

**Eaton**

**1:00 p.m.**

Nuclear energy's recent popularity illustrates how cultural trends come and go. This panel discussion brings together communications professionals to explore the ideas, messages, and products that shape nuclear energy policy, for better and for worse. From the China Syndrome to climate change and energy security, this session looks at words that work and ideas that resonate to help sustain the industry's momentum as an acknowledged solution to public concerns.

PANELISTS:

- Terry Botwick (*1019 Entertainment*)
- Ralph Winter (*1019 Entertainment*)
- Mimi Limbach (*Potomac Communications Group Inc*)
- Amy Lientz (*INL*)

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## Uranium Recovery: Reducing Environmental Impacts Through Technological Advances and Improved Operational Practices—Panel, sponsored by ESD; cosponsored by FCWMD.

Session Organizer: Ruth Weiner (*SNL*). Chair: Ruth Weiner

**Royal Palm Salon 2**

**1:00 p.m.**

To meet increased demand brought forth by the worldwide expansion of nuclear power, the uranium recovery industry is applying advanced technologies and new standards. This panel will cover technology and regulatory developments in current uranium recovery methods. Topics may include but are not limited to waste management, waste minimization, recycling and avoidance of legacy sites, operational and long-term environmental impacts of in situ recovery sites, benefits and limitations of applying a generic environmental impact statement to in situ recovery sites, knowledge transfer of operational and regulatory experience to new countries entering the uranium market, and voluntary initiatives and stakeholder involvement in support of sustainable uranium recovery practices.

PANELISTS:

- Latif Hamdan (*NRC*)
- Robb Grebb (*IFSOUP*)
- Mark Pelizza (*National Mining Assoc*)

**THURSDAY • JUNE 17, 2010**

**7:30 AM – 2:00 PM MEETING REGISTRATION**

**8:00 AM – 10:00 AM ICAPP'10: PLENARY 6:**

"Nuclear Fuel Cycle Options Perceptions and Realities"

**8:30 AM – 10:15 AM ST-NH2: TECHNICAL SESSION**

**8:30 AM – 11:30 AM 2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS**

- Point Kernel Shielding Techniques: A Tutorial on Quads/QAD MOD

- Operations and Power: General—II

- Advanced/Generation-IV Reactors

- General Thermal Hydraulics—II

- Nuclear Criticality Safety Standards—Forum

- Advances in Small- and Medium-Sized Reactor Designs

- Behavior and Performance of Fuels for Advanced Fuel Cycles

**8:30 AM – 11:30 AM NFSM for NGR: TECHNICAL SESSIONS**

**10:00 AM – 12:30 PM ICAPP'10: TECHNICAL SESSIONS**

**1:00 PM – 4:00 PM ICAPP'10: TECHNICAL SESSIONS**

**1:00 PM – 4:00 PM NFSM for NGR: TECHNICAL SESSIONS**

**1:00 PM – 5:00 PM TECHNICAL TOUR:**

"DIII-D, Urban Maglev and Algae Biodiesel Facilities" (at GA)

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**THURSDAY, JUNE 17, 2010, 8:30 A.M.**

## Point Kernel Shielding Techniques: A Tutorial on Quads/QAD MOD, sponsored by RPSD.

Session Organizer: Eric Burgett (*Georgia Tech*). Chair: Eric Burgett

**Royal Palm Salon 1**

**8:30 a.m.**

The point kernel method is a quick and easy way to evaluate shielding designs. Used for years by shielders before massive parallel computers were around, this tried-and-true method for shielding evaluation and design has become less common. This tutorial will explain the basics of the point kernel method and then introduce the QADS package—a useful multidimensional point kernel shielding program—in SCALE. Participants are encouraged to bring laptops with the SCALE code already installed. No laptops will be available, nor will the SCALE code be distributed. Students will be walked through several different point kernel shielding examples.

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**Operations and Power: General—II, sponsored by OPD.**

Chair: Sarah Kleeb (*SCE*)

**Royal Palm Salon 5**

**8:30 a.m.**

Best in Class SSC Life Cycle Management,

Kevin Feldhus (*BusinessGenetics*)

**8:55 a.m.**

Corrective Actions to Resolve the Check Valve Damage, Duck Jae Lim, Jung Yong Kim, Song Kyu Lee, Se Jin Baik (*KOPEC-Korea*), Yang Ki Park, Sung Yong s, Jang Un Lee (*KHNP*)

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**Advanced/Generation-IV Reactors, sponsored by OPD.**

Chair: Sasan Etemadi (*SCE*)

**Royal Palm Salon 5**

**9:25 a.m.**

Fluoride Salt Reactors (FHRs) and the Five Imperatives of Nuclear Energy, Sherrell R. Greene (*ORNL*)

# Technical Sessions by Day: Thursday

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## 9:50 a.m.

High Sensitive and Reliable FFDL Technique for SFR Using Laser Resonance Ionization Mass Spectrometry, Chikara Ito, Iwata Yoshihiro (JAEA–Japan), Hideki Harano (NIAIST–Japan), Tetsuo Iguchi (Nagoya Univ), Aoyama Takafumi (JAEA–Japan/Univ of Fukui)

## 10:15 a.m.

Ultrasonic Linear Array for Under Sodium Viewing, Jeffrey W. Griffin, Leonard J. Bond, Gerry J. Posakony, Timothy R. Peters, Kayte M. Denslow (PNNL)

## 10:40 a.m.

Retrieval of Damaged Components from Experimental Fast Reactor Joyo Reactor Vessel, Yukimoto Maeda (JAEA–Japan)

*NOTE: This session will immediately follow the preceding session, which will begin at 8:30 a.m.*

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## General Thermal Hydraulics—II, sponsored by THD.

*Chair: Si Lee (SRNL)*

### Windsor

#### 8:30 a.m.

Convective Heat Transfer in MHD Flows in Fusion Reactor Blankets, Ajay K. Choudary, M. S. Kalra, Saurabh Sharma (IIT)

#### 8:55 a.m.

Inverse Heat Conduction Problem with Jet Cooling, J. Luitjens, S. Cadell, Q. Wu (Oregon State Univ)

#### 9:20 a.m.

Noncondensable Gases Effect on Steam Condensation Heat Transfer in Horizontal Tube Bundle, A. V. Morozov, O. V. Remizov, A. A. Tsyganok (IPPE–Russia)

#### 9:45 a.m.

Enhancement of Passive Heat Removal for Add-On Shielding in a Spent Fuel Dry Storage System, Kai-Jing Yang (Nat'l Tsing Hua Univ–Taiwan), Yung-Shin Tseng, Jong-Rong Wang (INER–Taiwan), Chunkuan Shih (Nat'l Tsing Hua Univ–Taiwan)

#### 10:10 a.m.

Safety Margin Assessment Methodology Due to Aging-Induced Thermal-Hydraulic Effects, Yong Won Choi, Hyun Yub Noh, Sang Ki Kim, Un Chul Lee (Seoul Nat'l Univ–Korea)

#### 10:35 a.m.

Unsteady State Heat Transfer Analysis in a Magnesium-Thermic-Reduction Reactor for Uranium Production, Sumeet Soni, V. Eswaran, P. Munshi (IIT), S. Manna, S. B. Roy (BARC–India)

#### 11:00 a.m.

Thermal Performance Analysis for Small Ion-Exchange Cesium Removal Process, Si Y. Lee, William D. King (SRNL)

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## Nuclear Criticality Safety Standards–Forum, sponsored by NCSA.

*Session Organizer: Davis Reed (ORNL). Chair: Davis Reed*

### Hampton

#### 8:30 a.m.

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**Advances in Small- and Medium-Sized Reactor Designs**, sponsored by RPD. *Session Organizer: Youssef Shatilla (MASDAR Institute of Science and Technology). Chair: Youssef Shatilla*

### Sheffield

#### 8:30 a.m.

Design Features, Economics, and Licensing of the 4S Reactor, Yasushi Tsuboi, Kazuo Arie (Toshiba), Tony Greci (Westinghouse)

#### 8:50 a.m.

ELECTRA—European Lead-Cooled Training Reactor, Janne Wallenius, Andrei Fokau (KTH)

#### 9:10 a.m.

Nitride-Fueled Accelerator-Driven System with High Source Efficiency, Andrei Fokau, Janne Wallenius (KTH)

#### 9:30 a.m.

A Preliminary Physics Study of a Long-Life Modular Gas-Cooled Fast Reactor, Hangbok Choi, Alan Baxter, Robert Schleicher (General Atomics)

#### 9:50 a.m.

A Small Gas-Cooled Reactor for Space and Terrestrial Applications, Michael Worrall, Zeev Shayer (CSM)

#### 10:10 a.m.

Pebble-Bed System Features and Fuel Utilization, Ryan P. Kelly, Megan L. Pritchard, Pavel V. Tsvetkov (Texas A&M)

#### 10:30 a.m.

Conceptual Design of an Annular-Fueled Superheat Boiling Water Reactor, Yu-Chih Ko, Aydin Karahan, Edward E. Pilat, Mujid S. Kazimi (MIT)

#### 10:50 a.m.

Impact of Small Modular Reactors in a Carbon Constrained Economy, Cal Abel

#### 11:10 a.m.

Compact, Deployable Reactors for Power and Fuel in Remote Regions, James R. Powell, J. Paul Farrell (Radix Power and Energy Corp)

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## Behavior and Performance of Fuels for Advanced Fuel Cycles,

sponsored by FCWMD. *Session Organizer: Paul Wilson (Univ of Wisconsin, Madison). Chair: Erich Schneider (Univ of Texas, Austin)*

### Brittany

#### 8:30 a.m.

Actinide Transmutation Using Deep Burn in an Inert Matrix Fuel, G. D. Recktenwald (Univ of Texas, Austin), M. R. Deinert (Cornell Univ)

#### 8:55 a.m.

Neutronics and Material Attractiveness Calculations for Thorium-Fueled PWRs, Holly R. Trelue, Charles G. Bathke (LANL)

#### 9:20 a.m.

Lattice Expansion in Nuclear Fuels at High Burnups, Z. Insepov, J. Rest, G. L. Hofman (ANL)

#### 9:45 a.m.

Status Update on the NIFFTE High-Precision Fission Cross-Section Measurement Program, Eric Burgett (Georgia Tech)

#### 10:10 a.m.

Analysis of Short- and Long-Term Behavior of Spent Fuel Decay Heat in a PWR, M. Mazhari, M. Eskandari (Shiraz Univ)

### *2nd International Meeting of the Safety and Technology of Nuclear Hydrogen Production, Control, and Management*



**GENERAL CHAIR:**

**Dan R. Keuter**

*Energy Nuclear, Retired*



**TECHNICAL PROGRAM COCHAIR:**

**J. Stephen Herring**

*Idaho National Laboratory*



**TECHNICAL PROGRAM COCHAIR:**

**Dana A. Powers**

*Sandia National Laboratories*

#### **MONDAY, JUNE 14, 2010, 2:30–5:00 P.M.**

##### **Keynote and Opening Plenary: Nuclear Hydrogen Programs Around the World—Current Activities and Plans,**

sponsored by ESD; cosponsored by NISD.

*Session Organizer:* Gail H. Marcus (*Consultant for Nuclear Science and Technology*).

*Session Chair:* Gail H. Marcus

##### **Sunset**

**2:30 p.m.**

##### **KEYNOTE:**

Utility Production of Hydrogen from Nuclear Energy—Historical Perspective and Future Possibilities, Dan R. Keuter (*Energy Nuclear, retired*)

##### **OPENING PLENARY:**

This session will provide an update to the 2007 international overview session on nuclear hydrogen development programs. Several of the countries that participated previously will provide updated information on their activities over the past three years and their plans for the future. A special feature will be a presentation by IAEA on its newly developed Hydrogen Economic Evaluation Program (HEEP). The presentation will include a demonstration of the program.

##### **SPEAKERS:**

- Hydrogen Production Using Nuclear Energy—Summary of Some International Programs and the IAEA HEEP Software, Atam Rao (*IAEA*)
- The Current Status of the HTTR Project, Shusaku Shiozawa (*JAEA*)
- Progress of R&D on Nuclear Hydrogen Production in China, Ping Zhang (*Tsinghua Univ*)
- Vision and Challenges for the Nuclear Hydrogen in Korea, Jonghwa Chang (*KAERI*)

#### **TUESDAY, JUNE 15, 2010, 8:15 A.M.–12:00 P.M.**

##### **Managing Hydrogen Hazards in DOE Facilities: Research and Testing Needs for Safe Nuclear Operations—Panel,** sponsored by NISD.

*Session Organizer:* Kevin R. O’Kula (*URS Safety Management Solutions*).

*Session Chair:* Chip Martin (*DNFSB*)

##### **Sunset**

**8:15 a.m.**

This panel will discuss past experimental and test programs in hydrogen safety and whether these are adequate to support safe operations in nuclear reactor and nonreactor facilities. The discussion will begin by characterizing current phenomenology and related databases available to support nuclear facility safety. The panel will then provide an assessment on where gaps exist and identify recommendations on useful directions for either current or new testing programs to best close these gaps; the session will conclude by prioritizing recommended efforts.

##### **PANELISTS:**

- Dana A. Powers (*SNL*)
- Larry W. Brown (*DNFSB*)
- Joseph Shepherd (*California Institute of Technology*)
- Chip Lagdon (*DOE*)

##### **Experience, Testing, and Methodology Applications for Resolving Nuclear Waste,** sponsored by NISD.

*Session Organizer:* Kevin R. O’Kula (*URS Safety Management Solutions*).

*Session Chair:* Tinh Tran (*URS Safety Management Solutions*)

##### **Sunset**

**10:15 a.m.**

Mitigation of Hydrogen in a Mineral Binder with an Oxide Getter, David Lambertin (*CEA, Marcoule*), Fabien Frizon, Adrien Blachere, Florence Bart (*CEA*)

## Embedded Topical Meeting: ST-NH2

### 10:50 a.m.

Improved Hydrogen Generation Rate Equations for Hanford Radioactive Waste, Tachung Albert Hu (*DOE/ORP*)

### 11:25 a.m.

Flammability Limits of Hydrogen/Air Mixtures, Ahmed Bentaib (*IRSN*)

*NOTE: This session will immediately follow the preceding session, which will begin at 8:15 a.m.*

## TUESDAY, JUNE 15, 2010, 8:30–10:50 A.M.

**Production: High-Temperature Electrolysis**, sponsored by ESD; cosponsored by NISD. *Session Organizer:* J. Stephen Herring (*INL*).  
*Session Chair:* Carl Stoots (*INL*)

### Towne

#### 8:30 a.m.

Integrated Operation of INL HYTEST System and High-Temperature Steam Electrolysis for Synthetic Natural Gas Production, Carl Marcel Stoots, Lee Shunn, James O'Brien (*INL*), invited

#### 9:05 a.m.

Analysis of Improved Reference Design for a Nuclear-Driven High-Temperature Electrolysis Hydrogen Production Plant, Edwin A. Harvego, James E. O'Brien, Michael G. McKellar (*INL*)

#### 9:40 a.m.

Degradation Mechanism in  $\text{La}_{0.8}\text{Sr}_{0.2}\text{CoO}_3$  As Contact Layer on the Solid Oxide Electrolysis Cell Anode, Vivek Inder Sharma, Bilge Yildiz (*MIT*)

#### 10:15 a.m.

Operating Experience Review of the INL HTE Gas Monitoring System, Lee C. Cadwallader, Kevin G. DeWall (*INL*)

## TUESDAY, JUNE 15, 2010, 1:00–3:00 P.M.

**New Reactor Requirements for Combustible Gas Control—Panel**, sponsored by NISD. *Session Organizer:* John Lehner (*BNL*).  
*Session Chair:* Dana Powers (*SNL*)

### Sunset

#### 1:00 p.m.

This panel discusses lessons learned from the design certification process of new LWRs about meeting the updated combustible gas regulations of 10 CFR 50.44 and associated guidance in Regulatory Guides 1.7 and 1.136. Specifically, the panel will discuss how after an accident that releases hydrogen generated from a 100% metal-water reaction, applicants are demonstrating (a) containment structural integrity given that the containment must accommodate the pressure that results from such an accident and (b) survivability of equipment that is required to function after a severe accident.

### PANELISTS:

- Anne-Marie Grady (*NRC*)
- Other panelists to be determined.

## TUESDAY, JUNE 15, 2010, 1:30–4:25 P.M.

**Production: Thermochemical Cycles**, sponsored by ESD; cosponsored by NISD. *Session Organizer:* Kenneth R. Schultz (*General Atomics*).  
*Session Chair:* Kenneth R. Schultz

### Towne

#### 1:30 p.m.

Results of the Sulfur Iodine Process Integrated Lab Scale Experiment, Benjamin Russ (*General Atomics*), Robert Moore (*SNL*), Max Helie (*CEA*)

#### 2:05 p.m.

Influence of HTR Core Inlet and Outlet Temperatures on Hydrogen Generation Efficiency Using the Sulfur-Iodine Water-Splitting Cycle, Robert Thomas Buckingham, Lloyd C. Brown (*General Atomics*), Philippe Carles, Jean-Marc Borgard, Jean Leybros, Pascal Yvonne (*CEA*)

#### 2:40 p.m.

An Optimal Operating Window of the Bunsen Reaction in IS Thermochemical Cycle, Ho Joon Yoon, Hee C. No (*KAIST*)

#### 3:15 p.m.

A Possibility of Low Pressure Operation of Sulfur-Iodine Cycle Using Heat Exchanging-Depressurizing Loop, Youngsoo Kim, Hee Cheon No, Ho Hoon Yoon, Jeong Ik Lee (*KAIST*)

#### 3:50 p.m.

Efficiency Improvement in the Sulfur-Iodine Hydrogen Production Process Through Thermal Integration, Juan Luis Francois, Alexander Mendoza (*UNAM*)

## WEDNESDAY, JUNE 16, 2010, 8:30–10:50 A.M.

**Production: Hybrid Cycles and Process Technology**, sponsored by ESD; cosponsored by NISD. *Session Organizer:* J. Stephen Herring (*INL*).  
*Session Chair:* Max Gorenssek (*SRNL*)

### Sunset

#### 8:30 a.m.

Development Status of the Hybrid Sulfur Thermochemical Hydrogen Production Process, William A. Summers, Maximilian B. Gorenssek (*SRNL*)

#### 9:05 a.m.

Development of Once-Through Hybrid Sulfur Process for Nuclear Hydrogen Production, Yong Hun Jung, Yong Hoon Jeong (*KAIST*)

#### 9:40 a.m.

Sulfuric Acid Decomposition for the Sulfur-Based Thermochemical Cycles, Robert C. Moore, Paul S. Pickard, Gary E. Rochau, Edward J. Parma, Milton E. Vernon (*SNL*)

### 10:15 a.m.

Fracture Stress Estimation Method of SiC Components in the IS Process, Hirokai Takegami, Atsuhiko Terada, Ryutarō Hino, Shusaku Shiozawa (*JAEA-Japan*)

### WEDNESDAY, JUNE 16, 2010, 8:30–11:20 A.M.

**Progress in Hydrogen Mitigation by Passive Catalytic Recombiners, and Supporting Research and Development—I**, sponsored by NISD; cosponsored by ESD. *Session Organizer:* Dana Powers (*SNL*). *Session Chair:* Phillip G. Ellison (*GE Hitachi Nuclear*)

#### Towne

### 8:30 a.m.

MELCOR Code Application to Hydrogen Issue for Czech NPPs, Jiri Duspiva (*NRI*)

### 9:05 a.m.

Experimental Investigation of Commercial Passive Autocatalytic Recombiner (PAR) Units Under Accidental Scenarios, Sanjeev Gupta, Teja Kanzleiter, Gerhard Poss (*Becker Technol GmbH*)

### 9:40 a.m.

Catalyst for Recombination of Hydrogen and Oxygen in Confined Spaces Under High Concentrations of Hydrogen, Vladimir Andreevich Shepelin, Dmitry Koshmanov, Evgueni Chepelin (*Russian Energy Tech*)

### 10:15 a.m.

Influence of Hydrogen Charging and Oxidation Solutions on the Electrochemical Measurement of Hydrogen Permeation in Steel Sheets, Xiang Chen (*Univ of Illinois*), Massimo De Sanctis, Renzo Valentini, Gianfranco Lovicu, Randa Ishak (*Univ of Pisa*), James F. Stubbins (*Univ of Illinois*)

### WEDNESDAY, JUNE 16, 2010, 1:30–3:50 P.M.

**Progress in Hydrogen Mitigation by Passive Catalytic Recombiners and Supporting Research and Development—II**, sponsored by NISD; cosponsored by ESD. *Session Organizer:* Dana Powers (*SNL*). *Session Chair:* Anthony Cappucci, Jr. (*URS Safety Management Solutions*)

#### Sunset

### 1:30 p.m.

Simulation of PAR Operation Within Compartments—Coupling of REKO-DIREKT and CFX, Stephan Kelm, Ernst-Arndt Reinecke, Wilfried Jahn (*FzJ*), Hans-Josef Allelein (*RWTH Aachen Univ*)

### 2:05 p.m.

Validation of the PAR Code REKO-DIREKT: Postcalculation of Integral PAR Experiments in the ThAI Facility, Ernst-Arndt Reinecke (*FzJ*), Berno Simon, Hans-Josef Allelein (*RWTH Aachen Univ*)

### 2:40 p.m.

Detailed Experimental and Numerical Study of Passive Auto-Catalytic Recombiners, Nicolas Meynet, Ahmed Bentaib (*IRSN*), Ernie Reinecke, Stephan Kelm (*FzJ*)

### 3:15 p.m.

Numerical Study of Hydrogen Ignition by Passive Auto-Catalytic Recombiners, Nicolas Meynet, Ahmed Bentaib (*IRSN*)

### WEDNESDAY, JUNE 16, 2010, 1:30–4:25 P.M.

**Production: Systems Analysis and Modeling**, sponsored by ESD; cosponsored by NISD. *Session Organizer:* J. Stephen Herring (*INL*). *Session Chair:* J. Stephen Herring

#### Towne

### 1:30 p.m.

Integrating Nuclear and Renewables for Electricity and Hydrogen Production, Geoffrey Haratyk, Charles W. Forsberg (*MIT*)

### 2:05 p.m.

Review of the Potential of Nuclear Hydrogen for Addressing Energy Security and Climate Change, James E. O'Brien (*INL*)

### 2:40 p.m.

Synergistic Electricity Generation Using Both Carbon Resources and Nuclear Energy—Feeding Hydrogen Produced by Nuclear-Heated Steam-Reformer to Fuel Cell, Masao Hori (*Nuclear Systems Association*)

### 3:15 p.m.

Transient Analysis of Coupled Thermochemical Hydrogen Plant and PBMR, Nicholas Brown, Shripad T. Revankar (*Purdue Univ*)

### 3:50 p.m.

Development of Models for SI Cycle and PBMR for Analysis of Transient in Coupled Hydrogen Plant and VHTR, Nicholas Brown, Shripad T. Revankar (*Purdue Univ*)

### THURSDAY, JUNE 17, 2010, 8:30–10:15 A.M.

**Analytical Studies Supporting Nuclear Facility Safety**, sponsored by NISD; cosponsored by ESD. *Session Organizer:* Kevin O’Kula (*URS Safety Management Solutions*). *Session Chair:* Kevin O’Kula

#### Sunset

### 8:30 a.m.

Hydrogen Cylinder Storage Array Explosion Evaluations at the High Flux Isotope Reactor, David H. Cook (*UT-Battelle*)

### 9:05 a.m.

A PSA of the HTTR-IS Hydrogen Production Plant, Junichi Kudou (*Tohoku Univ*), Nariaki Sakaba (*JAEA-Japan*), Toshio Wakabayashi (*Tohoku Univ*)

### 9:40 a.m.

Application of Quantitative Risk Analysis for Informing Decision Making in DOE Nonreactor Nuclear Facilities, Kevin R. O’Kula, Jackie M. East (*URS Safety Management Solutions*)

# Embedded Topical Meeting: NFSM for NGR

## *Nuclear Fuels and Structural Materials for the Next Generation Nuclear Reactors*



**GENERAL COCHAIR:**

**Todd R. Allen**

*University of Wisconsin–Madison*



**GENERAL COCHAIR:**

**Lance L. Snead**

*Oak Ridge National Laboratory*



**TECHNICAL PROGRAM COCHAIR:**

**Wolfgang Hoffelner**

*RWH Consult GmbH*



**TECHNICAL PROGRAM COCHAIR:**

**Heather MacLean**

*Idaho National Laboratory*



**TECHNICAL PROGRAM COCHAIR:**

**Pascal J. Yvon**

*CEA*

**TUESDAY, JUNE 15, 2010, 8:15–9:50 A.M.**

**Plenary—Research and Development to Bridge Science and Technology.** *Cochairs:* Heather MacLean (*INL*), Pascal Yvon (*CEA*), Wolfgang Hoffelner (*PSI*)

**Sunrise**

**8:15 a.m.**

**SPEAKERS:**

- Introduction/Welcome, Todd Allen (*Univ of Wisconsin, Madison*), Lance Snead (*ORNL*)
- DOE Perspective on Fuels and Materials Needs for Advanced Nuclear Systems, Carter “Buzz” Savage (*DOE-NE*)
- Materials for Extreme Environments: A Perspective from DOE–Basic Energy Services, Linda Horton (*DOE-BES*)

**TUESDAY, JUNE 15, 2010, 10:10–11:30 A.M.**

**Fuels and Materials for Extended Lifetimes in Light Water Reactors.**

*Cochairs:* Todd Allen (*Univ of Wisconsin*), Dan Naus (*ORNL*)

**Sunrise**

**10:10 a.m.**

The Department of Energy Light Water Reactor Sustainability Program, Richard A. Reister (*DOE*)

**10:30 a.m.**

Regulatory Research to Support “Life Beyond 60” for a Second Round of License Renewal Application Reviews, C. E. (Gene) Carpenter, Jr. (*NRC*)

**10:50 a.m.**

Enabling Life Beyond 60: Materials Degradation Needs and Research, Jeremy Busby (*ORNL*)

**TUESDAY, JUNE 15, 2010, 1:00–2:20 P.M.**

**Materials—I.** *Cochairs:* Jeff Terry (*IIT*), Emmanuel Marquis (*Univ of Oxford*)

**Sunrise**

**1:00 p.m.**

Development and Testing of Radiation Tolerant Clad Materials for Nuclear Fuels, S. A. Maloy, P. Hosemann, J. Vanden Bosch (*LANL*), M. Toloczko (*PNNL*), J. Cole (*INL*), T. S. Byun (*ORNL*)

**1:20 p.m.**

MAX Phases and Their Potential for Nuclear Reactor Applications, E. N. Hoffman, M. W. Barsoum, R. L. Sindelar, D. Tallman (*SRNL*)

**1:40 p.m.**

Welding Challenges in Generation IV Nuclear Systems, George A. Young, Julie D. Tucker, Micah J. Hackett (*Bechtel*)

## 2:00 p.m.

Aging Management of Nuclear Power Plant Concrete Structures: An Overview of Activities and Candidate Research Areas, D. J. Naus (ORNL)

## TUESDAY, JUNE 15, 2010, 2:40–4:40 P.M.

**Enabling Tools and Research Facilities.** *Cochairs:* George Young (Bechtel), Maria Okuniewski (INL)

### Sunrise

#### 2:40 p.m.

The Advanced Test Reactor National Scientific User Facility, T. R. Allen, J. B. Benson, M. K. Meyer, F. M. Marshall, M. C. Thelen (INL)

#### 3:00 p.m.

The HFIR Reactor As a Test Bed for Fast Neutron Fuels and Structural Materials, Lance L. Snead, Jess C. Gehin, J. L. McDuffee, R. J. Ellis, R. T. Primm (ORNL)

#### 3:20 p.m.

JANNUS and JHR: Key Irradiation Facilities in Support of Materials Development for Advanced Nuclear Systems, J. Henry, P. Yvon, Y. Serruys, P. Trocellier (CEA-DEN), B. Décamps (CNRS-IN2P3), S. Carassou (CEA-DEN)

#### 3:40 p.m.

Advanced Photon Source Overview and Capabilities for Nuclear Fuels and Materials Research, Jeff Terry (IIT)

#### 4:00 p.m.

Irradiation Tests for the Development of FBR in Joyo, Yukimoto Maeda, Chikara Ito, Tomonori Soga (JAEA-Japan)

#### 4:20 p.m.

Atomic-Scale Characterization of Nuclear Reactor Materials, Emmanuelle A. Marquis (Univ of Oxford)

## WEDNESDAY, JUNE 16, 2010, 8:30–9:50 A.M.

**Fuels—I.** *Cochairs:* Manuel Pouchon (PSI), Dennis Keiser (INL)

### Sunrise

#### 8:30 a.m.

Mesoscale Simulation of Microstructure Evolution in Irradiated Materials, Paul C. Millett (INL), Anter El-Azab (Florida State Univ), Dieter Wolf (INL)

#### 8:50 a.m.

Modeling Deep Burn Particulate Nuclear Fuel, T. M. Besmann, R. E. Stoller, G. Samolyuk, P. C. Schuck (ORNL), J. M. Wills, M. A. Stan (LANL), B. D. Wirth (Univ of California, Berkeley), S. Kim, D. D. Morgan, I. Szlufarska (Univ of Wisconsin, Madison)

#### 9:10 a.m.

Modeling of Ag Diffusion in TRISO Coated Fuel Particles, Izabela Szlufarska, Dane D. Morgan, Sarah Khalil, David Shrader, Andrew Heim (Univ of Wisconsin, Madison)

## 9:30 a.m.

Spark Plasma Sintering as a Fabrication Process for Functional Oxides, Zuhair A. Munir (Univ of California, Davis)

## WEDNESDAY, JUNE 16, 2010, 10:10–11:30 A.M.

**Materials—II.** *Cochairs:* Dave Guzonas (AECL), Celine Cabet (CEA)

### Sunrise

#### 10:10 a.m.

Radiation Damage in Model FeCr Alloys and FM Steels, Maria Okuniewski, Xiao Pan, Carolyn Tomchik (Univ of Illinois), Mark Kirk (ANL), James F. Stubbins (Univ of Illinois)

#### 10:30 a.m.

Deformation Mechanisms in Ferritic/Martensitic Steels, Nasr M. Ghoniem, Giacomo Po (UCLA), Silvester Noronha (AREVA NP)

#### 10:50 a.m.

Radiation Induced Segregation in Ferritic-Martensitic Steels, Samrat Choudhury, Leland Barnard, Dane Morgan, Kevin Field, Todd Allen (Univ of Wisconsin, Madison), Janelle P. Wharry, Zhijie Jiao, Gary Was (Univ of Michigan), Brian Wirth (Univ of California, Berkeley)

#### 11:10 a.m.

Miniature Samples for Condition Based Monitoring in Nuclear Power Plants, Manuel Pouchon, Jiachao Chen, Wolfgang Hoffelner (Scherrer Inst)

## WEDNESDAY, JUNE 16, 2010, 1:00–2:20 P.M.

**Fuels—II.** *Cochairs:* Ted Besmann (ORNL), Kumar Sridharan (Univ of Wisconsin)

### Sunrise

#### 1:00 p.m.

GIF SFR Advanced Fuel Project: Consideration of Carbide Fuel in the Preliminary Evaluation of Candidates, F. Delage (CEA), J. Carmack (INL), C. B. Lee (KAERI-Korea), T. Mizuno (JAEA), J. Somers (EC-JRC-ITU)

#### 1:20 p.m.

Fuel Cladding Chemical Interaction in Metallic Nuclear Fuels, Dennis D. Keiser, Jr. (INL)

#### 1:40 p.m.

Liquid-Metal-Bonded Hydride Fuels for LWRs, D. R. Olander, K. Terrani, M. Balooch (Univ of California, Berkeley)

#### 2:00 p.m.

Irradiation Effects in UO<sub>2</sub> and CeO<sub>2</sub>, Bei Ye, Di Yun (Univ of Illinois), Mark Kirk (ANL), Aaron Oaks, Wei Ying Chen, Benjamin Holtzman, Mohamed ElBakhshwan, Brent Heuser, James F. Stubbins (Univ of Illinois)

# Embedded Topical Meeting: NFSM for NGR

**WEDNESDAY, JUNE 16, 2010, 2:40–4:20 P.M.**

**Corrosion.** *Cochairs:* Paul Millet (*INL*), Jim Stubbins (*Univ of Illinois*)

## Sunrise

**2:40 p.m.**

Radiation Chemistry of Water in Contact with Nuclear Fuels and Structural Materials, Simon M. Pimblott (*Univ of Manchester*), Jay A. LaVerne (*Univ of Notre Dame*)

**3:00 p.m.**

Corrosion in a Supercritical Water-Cooled Reactor, D. Guzonas (*AECL*)

**3:20 p.m.**

Molten Salt Corrosion, Celine Cabet (*CEA/DEN/DPC/SCCME*), Stephanie Fabre (*LGC, Univ Paul Sabatier*), Sylvie Delpesch (*ENSCP*)

**3:40 p.m.**

Corrosion Studies of High-Temperature Alloys in Molten Chloride Salt, James Ambrosek, Luke Olson, Kumar Sridharan, Todd Allen, Mark Anderson (*Univ of Wisconsin, Madison*)

**4:00 p.m.**

Alloys Compatibility in Molten Salt Fluorides: Kurchatov Institute Related Experience, Ignatiev Victor (*Kurchatov RRC*)

**WEDNESDAY, JUNE 16, 2010, 7:00–9:00 P.M.**

## Poster Session

### Grand Hall

**7:00–9:00 p.m.**

Ceramic Plasma-Sprayed Coating of Melting Crucible for Metal Fuel Slugs, K. H. Kim, C. T. Lee, C. B. Lee (*KAERI-Korea*), R. S. Fielding, J. R. Kennedy (*INL*)

Evaluations of Processing and Properties of HT-UPS Austenitic Stainless Steel, Yukinori Yamamoto, Philip J. Maziasz, Jeremy T. Busby (*ORNL*)

Using Graphitic Foam as the Bonding Material in Metal Fuel Pins for Sodium Fast Reactors, Aydin Karahan, Mujid S. Kazimi (*MIT*)

Corrosion Behavior of Alloy 690 and Effects of Grain Boundary Engineering, P. Xu, L. Y. Zhao, K. Sridharan, T. R. Allen (*Univ of Wisconsin, Madison*)

Influence of Microstructural Parameters on the Intergranular Cracking of Irradiated 316L Stainless Steel in Supercritical Water, E. A. West, G. S. Was (*Univ of Michigan*)

Hydrogen Permeability in VHTR Heat Exchanger Candidate Materials, Patrick Calderoni (*INL*)

Effect of Proton Irradiation on ZrC with Varied Stoichiometry, Yong Yang, Todd Allen (*Univ of Wisconsin, Madison*)

Microchemical Variations in Proton Irradiated 9 wt.% Chromium BCC Steels, K. G. Field (*Univ of Wisconsin, Madison*), J. Bentely (*ORNL*), T. R. Allen (*Univ of Wisconsin, Madison*)

Design of Alumina Forming FeCrAl Steels for Lead or Lead-Bismuth Cooled Fast Reactor, Jun Lim, Il Soon Hwang (*Seoul Natl Univ-Korea*), Ji Hyun Kim (*UNIST*)

Corrosion of Ferritic-Martensitic Steels in Steam Compared to Supercritical Water, J. Bischoff, A. T. Motta (*Penn State*), R. J. Comstock (*Westinghouse STD*), T. R. Allen (*Univ of Wisconsin, Madison*)

An Investigation of the Mechanical Properties of Fresh and Irradiated U-Mo Fuels, Ramprasad Prabhakaran, Douglas Burkes, Adam Robinson, Jan-Fong Jue (*INL*), Amy DeMint, Jack Gooch (*Y-12 NSC*), Dennis Keiser, Daniel Wachs, James Cole (*INL*), Indrajit Charit (*Univ of Idaho*)

Characterization of Vanadium-Lined Fuel Cladding with Various Fabrication Parameters, Mehran Mohammadian, Kumar Sridharan, Todd Allen, James Cole, Randall Fielding (*Univ of Wisconsin, Madison*)

Lead-Bismuth Eutectic Technology for HYPERION, J. Zhang, R. J. Kapernick, P. R. McClure, D. I. Poston (*LANL*), T. J. Trapp (*Hyperion Power Generation*)

Growth and Analysis of Thin Films of U<sub>3</sub>O<sub>8</sub> and UO<sub>2</sub> on Sapphire Substrates, Melissa M. Strehle, Hyunsu Ju, Brent J. Heuser (*Univ of Illinois*)

Microstructure Study of U-7wt%Mo/Al-2wt%Si Dispersion Fuel Focusing on Bubble Evolution, B. D. Miller (*Univ of Wisconsin, Madison*), J. Gan (*INL*), T. R. Allen (*Univ of Wisconsin, Madison*)

Measurement of Radiation Enhanced Diffusion of La in CeO<sub>2</sub>, Harrison K. Pappas, Brent J. Heuser, Hyunsu Ju (*Univ of Illinois*)

TRISO Fuels: Ab Initio Study of Pd and SiC, P. C. Schuck, R. E. Stoller (*ORNL*)

Microstructural Development in an Irradiated Monolithic LEU U-Mo Fuel Plate, Dennis D. Keiser, Jr., Jan Fong Jue, Adam B. Robinson, Pavel Medvedev, Daniel M. Wachs (*INL*), M. Ross Finlay (*ANSTO*)

Fission Product Transport of Cesium and Silver in CVD-SiC, Tyler Gerczak, Todd Allen (*Univ of Wisconsin, Madison*), Zihua Zhu (*PNNL*)

Phase Stability in Proton and Heavy Ion Irradiated Ferritic-Martensitic Alloys, Zhijie Jiao, Vani Shanka, Janelle Wharry, Gary Was (*Univ of Michigan*)

Effect of Alloying Elements on Mechanical Properties of Ferritic/Martensitic Steels, Sung-Ho Kim, Chang Hee Han, Woo Gon Kim, Chan Bock Lee (*KAERI-Korea*)

Spectral Emissivity Measurements of Candidate Alloys for Very High Temperature Reactors in High Temperature Air Environment, G. Cao, S. J. Weber, S. O. Martin, M. H. Anderson, K. Sridharan, T. R. Allen (*Univ of Wisconsin, Madison*)

Reactions of U-Zr Alloys and Fe at 1003 K, Takanari Ogata, Kinya Nakamura (*CRIEPI*), Akinori Itoh, Mitsuo Akabori (*JAERI*)

Reaction of Rare Earth Elements with Iron-Base Alloy, Kenta Inagaki, Takanari Ogata (*CRIEPI*)

Phase Instabilities Observed in EP-450 Ferritic-Martensitic Steel Irradiated at  $\sim 300^\circ\text{C}$  to 40.3 dpa in the BN-350 Fast Reactor, O. P. Maksimkin, L. G. Turubarova, T. A. Doronina (*Inst Nuclear Physics-Kazakhstan*), F. A. Garner (*TechSource Inc*)

The Importance of Fixing Both Upper and Lower Limits of Minor Element Composition in Austenitic Stainless Steels Used in Fast Reactors, F. A. Garner (*TechSource Inc*), S. I. Porollo, Yu. V. Konobeev (*IPPE*), B. J. Makenas (*Hanford Mission Support Alliance*), S. A. Chastain (*Hanford Plateau Remediation Contractor*)

Modeling of Inert Matrix Nitride Fuels for Generation IV Reactors, Merja Pukari, Janne Wallenius (*KTH*)

Effect of Thermomechanical Treatment on 9% Cr Ferritic-Martensitic Steels, L. Tan, J. T. Busby (*ORNL*)

Modeling UZr Metallic Fuels: Coupling Thermodynamics with Microstructure, James Belak, Jean-luc Fattebert, Alex Landa, Per Soderlind, Luis Zepeda-Ruiz, Patrice Turchi (*LLNL*)

A Methodology for Quantitative Determination of Anisotropy of Pyrolytic Carbon, Anne A. Campbell, Kent B. Campbell, Gary S. Was (*Univ of Michigan*)

Modeling Gas Diffusion on a Microscopic Scale, Odd Runevall, Nils Sandberg (*KTH*)

Modeling the Radiation Stability of Nanoclusters in Ferritic Steels, A. Certain, T. R. Allen (*Univ of Wisconsin, Madison*), H.-J. Lee, D. Xu, B. D. Wirth (*Univ of California, Berkeley*)

In Situ TEM Study of Gas Bubble Formation in Krypton-Implanted  $\text{CeO}_2$ , Bei Ye, James F. Stubbins (*Univ of Illinois*), Mark A. Kirk (*ANL*)

Mechanism of Plastic Deformation of a Ni-Based Superalloy for VHTR Applications, Kun Mo, Xiang Chen (*Univ of Illinois*), Gianfranco Lovicu (*Univ of Pisa*), Hsiao-Ming Tung, James F. Stubbins (*Univ of Illinois*)

Postirradiation Examination of Metallic Fuel for Minor Actinides Transmutation in Fast Reactor, V. V. Rondinella (*EC-JRC-ITU*), H. Ohta (*CRIEPI*), D. Papaioannou (*EC-JRC-ITU*), T. Ogata (*CRIEPI*), D. Pellottiero (*EC-JRC-ITU*), T. Koyama (*CRIEPI*), J.-P. Glatz (*EC-JRC-ITU*)

Study of Irradiated Mod.9Cr-1Mo Steel by Synchrotron XAS, Meimei Li (*ANL*), Yulia Trenikhina, Dan Olive, Hasitha Ganegoda, Jeff Terry (*IIT*), Stuart A. Maloy (*LANL*)

Irradiation Damage on Fiber-Reinforced SiC, Wolfgang Hoffelner, Jiachao Chen, Tomislav Rebac, Yong Dai (*Scherrer Inst*)

Friction Stir Welding of Oxide Dispersion Strengthened Alloys, Ramprasad Prabhakaran (*INL*), Jiye Wang, Wei Yuan (*Missouri Univ Sci Tech, Rolla*), Kalyan Chitrada (*Univ of Idaho*), James Cole (*INL*), Indrajit Charit (*Univ of Idaho*), Rajiv Mishra (*Missouri Univ Sci Tech, Rolla*)

Volatile Species Retention During Metallic Fuel Casting, Randall Fielding, Douglas Porter (*INL*)

Strength of SiC/SiC Composites After Neutron Irradiation at up to  $1300^\circ\text{C}$ , Yutai Katoh, Kazumi Ozawa, Lance Snead (*ORNL*), Tatsuya Hinoki (*Kyoto Univ*), Akira Hasegawa (*Tohoku Univ*)

Hot Steam Corrosion Characteristics of Ni-Base Superalloys for Intermediate Heat Exchangers of HTSE System, Donghoon Kim, Daejong Kim, Jahyun Koo, Duk Joo Yoon, Changheui Jang (*KAIST*)

Characterization of ZrC-TRISO Particles, G. W. Chinthaka Silva, John D. Hunn, Rodger C. Martin, Fred C. Montgomery, James Henry Miller, Andrew K. Kercher, Madhavi Z. Martin, Harry M. Meyer (*ORNL*)

Corrosion Behavior of an FeCrAl Alloy in Lead-Bismuth Eutectic, Xiang Chen, Alan Bolind, James F. Stubbins (*Univ of Illinois*)

Minor-Actinide and Lanthanide Migration in the U-Zr Alloy Fuel, Yeon Soo Kim, G. L. Hofman, T. Wiencek, E. O'Hare (*ANL*), T. Ogata (*CRIEPI*)

A Thermal Conductivity Measurement System for TRISO Fuel Compacts, Colby Jensen, Changhu Xing, Heng Ban (*Utah State Univ*), Charles Barnes (*INL*)

Model-Based Breed and Burn Reactor, Anatoly Blanford (*Westside Environmental Technol*)

Thermal Analysis of High-Temperature Irradiation Modules in In-Core Sample Assembly, Sung Joong Kim, Yakov Ostrovsky, Lin-wen Hu, Gordon Kohse (*MIT*)

Resonant Ultrasound Spectroscopy Measurements of the Elastic Properties of Uranium and Plutonium Based Oxide Fuels, Tarik A. Saleh, Erik P. Luther, Douglas J. Safarik, Timothy J. Ulrich, Darrin D. Byler, Franz J. Freibert, Stephen P. Willson (*LANL*)

Fabrication and Characterization of EBR-II Type Fuels for Irradiation in ATR, Robert Mariani, Cynthia Papesch, Dawn Janney, Timothy Hyde, Thomas O'Holleran, J. Rory Kennedy, Heather MacLean (*INL*)

Postirradiation Examination of Full-Sized Monolithic U-Mo Fuel at Low Temperatures, Adam Robinson, Daniel Wachs, Dennis Keiser, Douglas Porter (*INL*)

Uranium Powder Production Using a Hydride-Dehydride Process, Grant W. Helmreich, William J. Sames, David J. Garnetti, Sean M. McDevitt (*Texas A&M*)

Out-of-Pile Effects of Lanthanide Rare-Earth Elements on Fuel-Cladding Compatibility, James I. Cole, Thomas P. O'Holleran, D. D. Keiser, J. R. Kennedy (*INL*)

Investigation of Multi-Scale Atomistic Simulations for Noble Fission Gas Diffusion in  $\text{UO}_2$ , J. M. Harp, A. I. Hawari (*NCSU*)

## Embedded Topical Meeting: NFSM for NGR

Structure of Oxide Layers Formed on HT-9 and T91 Steels in Flowing Lead-Bismuth, J. Kunkle (*Penn State*), A. Siwy (*Duke Energy*), A. T. Motta (*Penn State*)

An Evaluation of the MATPRO Fuel Creep Model Using the FALCON Fuel Analysis Code, Anh T. Mai, William F. Lyon, Robert O. Montgomery, Robert S. Dunham (*Anatech Corp*)

Statistical Analysis Support for Nuclear Fuel Performance Experimental Data Qualification, Binh T. Pham, Jeffrey J. Einerson (*INL*)

Understanding the Effects of Impurities in Liquid Sodium by Establishing Impure He Environments, G. Gulsoy, G. S. Was (*Univ of Michigan*)

In Situ Proton Irradiation Creep of Ferritic-Martensitic Steel T91, Cheng Xu, Gary S. Was (*Univ of Michigan*)

Role of Cr on Oxidation Mechanism of Ferritic-Martensitic Alloys in 600°C Supercritical Water, Pantip Ampornrat, Lumin Wang, Gary S. Was (*Univ of Michigan*)

Time-Dependent Fatigue Crack Propagation of Solid-Solution-Strengthened Superalloys at Elevated Temperature, Longzhou Ma (*UNLV*)

### THURSDAY, JUNE 17, 2010, 8:30–9:50 A.M.

**Materials—III (HTGR).** *Cochairs:* Yann de Carlan (*CEA*), Lizhen Tan (*ORNL*)

#### Sunrise

##### 8:30 a.m.

Graphite for Nuclear Reactors, Graham Hall, Barry Marsden, Abbie Jones (*Univ of Manchester*)

##### 8:50 a.m.

Engineered Coatings for Ni Alloys in High-Temperature Reactors, E. A. Clark, J. Y. Yang (*Univ of California, Santa Barbara*), D. Kumar, G. S. Was (*Univ of Michigan*), C. G. Levi (*Univ of California, Santa Barbara*)

##### 9:10 a.m.

Aging and Environmental Effects on VHTR High-Temperature Alloys, Richard Wright, Laura Carroll (*INL*), Celine Cabet (*INL/CEA*)

##### 9:30 a.m.

Expediting ASME HTGR Code Rules, Jim Ramirez (*ASME*)

### THURSDAY, JUNE 17, 2010, 10:10–11:30 A.M.

**Fuels—III.** *Cochairs:* John Lambert (*ANL*), Tai Asayama (*JAEA*)

#### Sunrise

##### 10:10 a.m.

Development of TRU-TRISO Fuel for Deep Burn, John D. Hunn, Rodney D. Hunt, James H. Miller (*ORNL*)

##### 10:30 a.m.

Particle Fuel for Future Reactor Systems, Manuel A. Pouchon (*Scherrer Inst*)

##### 10:50 a.m.

HTR Fuel Testing in AVR and in MTRs, Heinz Nabielek, Karl Verfondern (*FzJ*), Michael J. Kania (*Consultant*)

##### 11:10 a.m.

New Generation Nuclear Fuel Structures: Dense Particles in Selectively Soluble Matrix, Dave Devlin, Gordon Jarvinen, Brian Patterson, Steve Pattillo, James Valdez, X.-Y. Liu, Jonathan Phillips (*LANL*)

### THURSDAY, JUNE 17, 2010, 1:00–2:20 P.M.

**Leveraging Materials Progress for Next Generation Reactors.**

*Cochairs:* Carlos Levi (*UCSB*), Graham Hall (*Univ of Manchester*)

#### Sunrise

##### 1:00 p.m.

ODS Materials for Fast Reactors, Yann de Carlan, Philippe Dubuisson (*CEA*)

##### 1:20 p.m.

Response of Nanoclusters in Nanostructured Ferritic Alloys to Low-Dose Proton Irradiation, A. G. Certain, K. G. Field, T. R. Allen (*Univ of Wisconsin, Madison*), M. K. Miller, J. Bentley (*ORNL*)

##### 1:40 p.m.

Grain Boundary Engineering for Structure Materials of Nuclear Reactor, L. Tan (*ORNL*), T. R. Allen (*Univ of Wisconsin, Madison*), J. T. Busby (*ORNL*)

##### 2:00 p.m.

Innovative SiCf/SiC Composite Materials for Fast Reactor Applications, Laurent Chaffron, Jean-Louis Séran (*CEA, Saclay*)

### THURSDAY, JUNE 17, 2010, 2:40–4:00 P.M.

**Materials—IV.** *Cochairs:* Alicia Certain (*Univ of Wisconsin*), John Hunn (*ORNL*)

#### Sunrise

##### 2:40 p.m.

Irradiation Creep, J. Chen, W. Hoffelner (*Scherrer Inst*)

##### 3:00 p.m.

Issues on the Evaluation of Creep-Fatigue Interaction, Tai Asayama (*JAEA-Japan*)

##### 3:20 p.m.

High-Temperature Crack Growth Considerations for Next Generation Nuclear Reactors, Frederick W. (Bud) Brust (*Engineering Mechanics Corp of Columbus*)

# Embedded Topical Meeting: ICAPP'10

ROOM	MONDAY, JUNE 14, 2010		TUESDAY, JUNE 15, 2010				
	2:30 PM - 4:00 PM	4:00 PM - 6:00 PM	8:00 AM - 10:00 AM	10:00 AM - 12:00 PM	1:00 PM - 2:30 PM	2:30 PM - 4:00 PM	4:00 PM - 6:00 PM
Pacific Salon 1	Boiling Water Reactors			Near Term Deployment—II	Supercritical Water Reactors—II	Supercritical Water Reactors—III	
Pacific Salon 2	HTGR Systems Engineering and Design, Safety/Licensing			CFD Analysis and Optimization	Severe Accidents—I: Experiments (Part A)	Severe Accidents—II: Experiments (Part B)	
Pacific Salon 3	Sodium-Cooled Fast Reactors—I			Lead-Cooled Fast Reactors	Energy Conversion for Advanced Reactors—I	Energy Conversion for Advanced Reactors—II	
Pacific Salon 4	Safety Analysis and Licensing of non-LWR Reactor Concepts			Integral and Separate Thermal Hydraulics Testing and Analysis—I	Best Estimate Analysis Codes and Uncertainty Methodologies—I	Best Estimate Analysis Codes and Uncertainty Methodologies—II	
Pacific Salon 5	Near Term Deployment—I			Reactor Physics Benchmark and Validation	System Simulation Models and Codes—I	System Simulation Models and Codes—II	
Pacific Salon 6	Partitioning and Transmutation Issues			Structural Analysis and Design	Used Fuel Recycling Technologies—I	Used Fuel Recycling Technologies—II	
Pacific Salon 7	Multinational Regulatory Cooperation			Nuclear Energy and Global Environment—I	Regulatory Oversight of Construction and Vendor Inspection	Key Licensing and Regulatory Issues for Small and Medium Reactors	
San Diego Room		Plenary 1: New Nuclear Build—Perspectives from around the World	Plenary 2: Approach to Effective and Efficient Nuclear Power Regulation		HTGR System and Thermal Fluid Analysis		Plenary 3: An International Outlook on Nuclear Power

# Embedded Topical Meeting: ICAPP'10

ROOM	WEDNESDAY, JUNE 16, 2010					THURSDAY, JUNE 17, 2010		
	8:00 AM–10:00 AM	10:00 AM–12:00 PM	1:00 PM–2:30 PM	2:30 PM–4:00 PM	4:00 PM–6:00 PM	8:00 AM–10:00 AM	10:00 AM–12:00 PM	1:00 PM–4:00 PM
<b>San Diego Room</b>	Plenary 4: Emerging & Future LWR Designs	Software and Digital I&C Issues	Severe Accidents—II: Modeling		Plenary 5: Global Nuclear Energy Opportunities and Challenges	Plenary 6: Nuclear Fuel Cycle Options Perceptions and Realities	Nuclear Waste Management	
<b>Pacific Salon 1</b>		Supercritical Water Reactors—I	Performance and Reliability Improvements				Pressurized Water Reactors	Generic/Longer Term Concepts
<b>Pacific Salon 2</b>		HTGR Accident Analysis	Next Generation Reactor Design and Analysis	HTGR Reactor Core Physics Methods			Severe Accidents—III: Plant Studies	Advances in Regulatory Issues
<b>Pacific Salon 3</b>		Sodium-Cooled Fast Reactors—II	Sodium-Cooled Fast Reactors—III	Sodium-Cooled Fast Reactors—IV			Sodium-Cooled Fast Reactors—V	Sodium-Cooled Fast Reactors—VI
<b>Pacific Salon 4</b>		Integral and Separate Thermal Hydraulics Testing and Analysis—II	Advances in Two-Phase Flow and Heat Transfer				Advanced Reactor Testing and Analysis—I	Advanced Reactor Testing and Analysis—II
<b>Pacific Salon 5</b>		CFD Applications to Water, Liquid Metal and Gas Reactors—II	CFD Applications to Water, Liquid Metal and Gas Reactors—I	Light Water Reactor Analysis			Thermal Hydraulics Measurement and Modeling Fundamentals	LOCA and Non-LOCA Safety Analysis
<b>Pacific Salon 6</b>		Strategies for Sustainable Fuel Cycle	LWR Materials Issues	Materials for Gen IV Reactors and Fusion Systems			Materials Irradiation and Facilities	Materials Modeling and Testing
<b>Pacific Salon 7</b>		Risk Analysis and Risk Informed Applications	New Reactor Licensing in the US – Status and Projections	New Reactor Siting Issues			Operational Experience	Nuclear Energy and Global Environment—II



**HONORARY CO-CHAIR:**  
**Warren F. "Pete" Miller, Jr.**  
*U.S. Department of Energy*



**HONORARY CO-CHAIR:**  
**Takuya Hattori**  
*JAIF*



**HONORARY CO-CHAIR:**  
**Chang Sun Kang**  
*Seoul National University*



**HONORARY CO-CHAIR:**  
**Philippe Pradel**  
*CEA*



**GENERAL CO-CHAIR:**  
**John R. McGaha**  
*Enxus Energy, Inc.*



**GENERAL CO-CHAIR:**  
**Kiyoshi Okamura**  
*Toshiba Corporation*



**GENERAL CO-CHAIR:**  
**Goon-Cherl Park**  
*Seoul National University*



**GENERAL CO-CHAIR:**  
**Jean Claude Gauthier**  
*AREVA NP*



**PROGRAM CO-CHAIR:**  
**Jacopo Buongiorno**  
*Massachusetts Institute of Technology*



**PROGRAM CO-CHAIR:**  
**Izumi Kinoshita**  
*CRIEPI*



**PROGRAM CO-CHAIR:**  
**Hark-Rho Kim**  
*KAERI*



**PROGRAM CO-CHAIR:**  
**Frank Carré**  
*CEA*

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**Samim Anghaie**, *Consultant*

**Atam Rao**, *IAEA*

**Hideaki Heki**, *Toshiba Corporation*

**Kee-Cheol Park**, *KHNP*

**Bernard Jolly**, *SFEN*

# Embedded Topical Meeting: ICAPP'10 (Monday)

MONDAY • JUNE 14, 2010	
7:30 AM – 5:00 PM	<b>MEETING REGISTRATION</b>
8:00 AM – 10:00 AM	<b>SPOUSE/GUEST HOSPITALITY</b>
8:00 AM – 11:30 AM	<b>2010 ANS ANNUAL MEETING: OPENING PLENARY</b> “Nuclear Science and Technology—The Right Fit. The Right Time.”
9:30 AM – 1:30 PM	<b>SPOUSE/GUEST TOUR</b> “Vintage Vineyard Tour”
11:30 AM – 1:00 PM	<b>ATTENDEE LUNCHEON IN THE ICAPP'10 EXHIBIT</b>
11:30 AM – 1:00 PM	<b>OPERATIONS AND POWER DIVISION LUNCHEON</b>
1:00 PM – 2:30 PM	<b>2010 ANS ANNUAL MEETING: ANS PRESIDENT'S SPECIAL SESSION</b> “U.S. Engagement in the Global Nuclear Renaissance—The Path Forward”
2:30 PM – 4:00 PM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b>
2:30 PM – 4:00 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Boiling Water Reactors</li><li>• HTGR Systems Engineering and Design, Safety/Licensing</li><li>• Sodium-Cooled Fast Reactors—I</li><li>• Safety Analysis and Licensing of Non-LWR Reactor Concepts</li><li>• Partitioning and Transmutation Issues</li><li>• Near Term Deployment—I</li><li>• Multinational Regulatory Cooperation</li></ul>
2:30 PM – 5:00 PM	<b>ST-NH2: KEYNOTE AND OPENING PLENARY:</b> “Nuclear Hydrogen Programs Around the World—Current Activities and Plans”
4:00 PM – 6:00 PM	<b>ICAPP'10: OPENING PLENARY:</b> “New Nuclear Build—Perspectives from Around the World”
6:30 PM – 10:30 PM	<b>EVENING EVENT:</b> “Reception and Dinner at the USS Midway Museum”

MONDAY, JUNE 14, 2010 • 2:30 P.M. – 4:00 P.M.

## Boiling Water Reactors

Session Chair: MD Alamgir (*GE-Hitachi Nuclear Energy*)

### Pacific Salon 1

2:30 p.m.

The Severe Accident Control Strategy of the KERENA™ BWR, Manfred Fischer, Patrick Levi (*AREVA NP GmbH*)

2:50 p.m.

Development of Advanced BWR Fuel Bundle with Spectral Shift Rod (1) - Overview of the Project, Masao Chaki (*Hitachi-GE Nuclear Energy*), Yukiharu Ohga (*The Institute of Applied Energy*), Moriyasu Abe (*TEPCO*)

3:10 p.m.

Development of Advanced BWR Fuel Bundle with Spectral Shift Rod (2) - Evaluation of ABWR Core Characteristics with SSR, Tetsushi Hino, Takeshi Mitsuyasu, Motoo Aoyama (*Hitachi-GE Nuclear Energy*), Yukiharu Ohga (*The Institute of Applied Energy*), Moriyasu Abe (*TEPCO*)

3:30 p.m.

Development of Advanced BWR Fuel Bundle with Spectral Shift Rod (3) -Transient Analysis of ABWR Core with SSR, Tomohiko Ikegawa, Masao Chaki (*Hitachi-GE Nuclear Energy*), Yukiharu Ohga (*The Institute of Applied Energy*), Moriyasu Abe (*TEPCO*)

3:50 p.m.

ESBWR Long Term Containment Response to Loss of Coolant Accidents, MD Alamgir, Wayne Marquino, Jesus Diaz-Quiroz, Larry Tucker (*GE-Hitachi Nuclear Energy*)

## HTGR Systems Engineering and Design, Safety/Licensing

Session Chairs: Michael A. Fütterer (*JRC Petten*), Stuart Rubin (*US NRC*)

### Pacific Salon 2

2:30 p.m.

Development of Tritium Permeation Analysis Code and Tritium Transport in a High Temperature Gas-Cooled Reactor Coupled with Hydrogen Production System, Eung Soo Kim, Chang Oh, Mike Patterson (*INL*)

2:50 p.m.

Innovative Compact Heat Exchangers, David Southall, Stephen John Dewson (*Heatric*)

3:10 p.m.

HTGR Strategies to Meet Process Heat Reliability and Availability Needs, Elisa M. Herd, Lewis J. Lommers, Finis H. Southworth (*AREVA*)

## Sodium-Cooled Fast Reactors-I

Session Chairs: Jean-Pol Serpantié (*AREVA NP*), Pradip Saha (*GE-Hitachi Nuclear Energy*)

### Pacific Salon 3

2:30 p.m.

Conceptual Design Study toward the Demonstration Reactor of JSFR, Takaaki Sakai, Shoji Kotake, Kazumi Aoto (*JAEA*), Takuya Ito, Yoshio Kamishima, Jun Ohshima (*MFBR*)

2:50 p.m.

Preliminary Analysis to Guide the Choice of the Power Capacity of the Future French Sodium Fast Reactor Prototype, G. Mignot, M.S. Chenuaud, N. Devictor, L. Paret, G. Rodriguez, P. Dubuisson, P. Dufour, J. Rouault (*CEA*)

3:10 p.m.

ARC-100: A Sustainable, Modular Nuclear Plant for Emerging Markets, David C. Wade, Leon Walters (*Advanced Reactor Concepts*)

3:30 p.m.

Traveling-Wave Reactors: A Truly Sustainable and Full-Scale Resource for Global Energy Needs, Tyler Ellis, Robert Petroski, Pavel Hejzlar, George Zimmerman, David McAlees, Charles Whitmer, Nicholas Touran, Jonatan Hejzlar, Kevan Weaver, Joshua C. Walter, Jon McWhirter, Charles Alhfeld, Thomas Burke, Ash Odedra, Rod Hyde, John Gilleland, Yuki Ishikawa, Lowell Wood, Nathan Myhrvold, William H. Gates, III (*TerraPower*)

## Safety Analysis and Licensing of non-LWR Reactor Concepts

Session Chair: Soo Suk (*KAERI*)

### Pacific Salon 4

2:30 p.m.

Loss of Flow Accident Analysis of the MIT Research Reactor HEU-LEU Transitional Cores Using RELAP5-3D, Sung Joong Kim, Yu-chih Ko, Lin-wen Hu (*MIT*)

2:50 p.m.

Severe Accident Energetics in a Metal-Fueled Sodium Fast Reactor, Soo-Dong Suk, Yong-Bum Lee (*KAERI*)

# Embedded Topical Meeting: ICAPP'10 (Monday/Tuesday)

## 3:10 p.m.

Application of Integrated Safety Assessment Methodology (ISAM) to Japanese Sodium-cooled Fast Reactor (*JSFR*), Kenichi Kurisaka (*JAEA*), Yoshio Shimakawa (*MFBR*)

## 3:30 p.m.

Stratified Flow Induced Air-ingress Accident Assessment of GAMMA Code, Hyumg Gon Jin, Hee Cheon No, Hyeon IL Kim (*KAIST*)

## Partitioning and Transmutation Issues

Session Chairs: Temitope Taiwo (*ANL*), Taek K. Kim (*ANL*)

## Pacific Salon 6

### 2:30 p.m.

Fuel Cycle Isotope Evolution by Transmutation Dynamics over Multiple Recycles, Samuel Bays, Steven Piet (*INL*), Amaury Dumontier (*Mines Paris Tech*)

### 2:50 p.m.

Accelerator Driven Systems for Transmutation: Main Design Achievements of the XT-ADS and EFIT Systems within the FP6 IP-EUROTRANS Integrated Project, D. De Bruyn (*SCK•CEN*), S. Larmignat, A. Woaye-Hune (*AREVA*), L. Mansani (*ANSALDO*), G. Rimpault (*CEA*), C. Artioli (*ENEA*)

### 3:10 p.m.

MgO-based CERCER Fuel for Minor Actinides Transmutation: Low Burnup Investigations, R. Calabrese, F. Vettriano (*ENEA*)

## Near Term Deployment-I

Session Chairs: Jeffrey F. Hamel (*EPRI*), Tom Mulford (*EPRI*)

## Pacific Salon 5

### 2:30 p.m.

EPRI Advanced Nuclear Technology Materials Management Matrix, Jeffrey Hamel (*EPRI*), Wayne Lunceford (*Alliance Engineering*), David Sandusky (*XGEN Engineering*)

### 2:50 p.m.

Competitiveness of Small-Medium Reactors: A Probabilistic Analysis of Capital Cost, Andrea Trianni, Paolo Trucco (*Politecnico di Milano*)

### 3:10 p.m.

Modularity in Design and Construction of Nuclear Power Plants, Ashok Kumar Upadhyay (*Nuclear Power Corporation of India Limited, Indian Institute of Technology Bombay*), Karuna Jain (*Indian Institute of Technology Bombay*), Umesh Chandra (*Nuclear Power Corporation of India Limited*)

## Multinational Regulatory Cooperation

Session Chair: Gary Holahan (*US NRC*)

Session Organizer: Donna Williams (*US NRC*)

## Pacific Salon 7

### PANELISTS:

- Multinational Design Evaluation Program, Donna Williams (*US NRC*)
- IAEA Cooperative Activities Related to New Reactors, Mike Modro (*IAEA*)
- EDF Family, Greg Gibson (*UniStar*)
- Generation IV International Forum, Harold McFarlane (*INL*)
- Multinational Vendor Inspection Cooperation, Sungho Yang (*KINS*)

## MONDAY, JUNE 14, 2010 • 4:00 P.M. – 6:00 P.M.

### Plenary 1: New Nuclear Build – Perspectives from around the World

Session Chairs: Warren (Pete) Miller, Jr. (*DOE*),

Philippe Pradel (*CEA-France*)

## San Diego Room

### SPEAKERS:

- John McGaha (*Entergy/Enexus*)
- William Timmerman (*SCANA*)
- Jong-Shin Kim (*KHNP-Korea*)
- Jacques Besnainou (*AREVA*)
- Thomas Weir (*Westinghouse*)
- Akira Omoto (*AEC-Japan*)
- Marv Fertel (*NEI*)

## TUESDAY • JUNE 15, 2010

7:30 AM – 5:00 PM	<b>MEETING REGISTRATION</b>
8:00 AM – 10:00 AM	<b>ICAPP'10: PLENARY 2:</b> “Approach to Effective and Efficient Nuclear Power Regulation”
8:00 AM – 10:00 AM	<b>SPOUSE/GUEST HOSPITALITY</b>
8:15 AM – 9:50 AM	<b>NFSM for NGNR: OPENING PLENARY</b>
8:15 AM – 12:00 PM	<b>ST-NH2: TECHNICAL SESSIONS</b>
8:30 AM – 11:30 AM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b>
10:00 AM – 12:00 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• CFD Analysis and Optimization</li><li>• Lead-Cooled Fast Reactors</li><li>• Reactor Physics Benchmark and Validation</li><li>• Integral and Separate Thermal Hydraulics Testing and Analysis—I</li><li>• Structural Analysis and Design</li><li>• Nuclear Energy and Global Environment—I</li><li>• Near Term Deployment—II</li></ul>
10:10 AM – 11:50 AM	<b>NFSM for NGNR: TECHNICAL SESSIONS</b>
11:30 AM – 1:00 PM	<b>ANS HONORS AND AWARDS LUNCHEON</b>
1:00 PM – 4:00 PM	<b>2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS</b>
1:00 PM – 2:30 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Supercritical Water Reactors—II</li><li>• HTGR System and Thermal Fluid Analysis</li><li>• Energy Conversion for Advanced Reactors—I</li><li>• Severe Accidents—I (Part A)</li><li>• Best Estimate Analysis Codes and Uncertainty Methodologies—I</li><li>• System Simulation Models and Codes—I</li><li>• Used Fuel Recycling Technologies—I</li><li>• Regulatory Oversight of Construction and Vendor Inspection</li></ul>
1:00 PM – 4:25 PM	<b>ST-NH2: TECHNICAL SESSIONS</b>
1:00 PM – 4:40 PM	<b>NFSM for NGNR: TECHNICAL SESSIONS</b>
1:00 PM – 5:00 PM	<b>SPOUSE/GUEST TOUR</b> “San Diego by Land and Sea”
2:30 PM – 4:00 PM	<b>ICAPP'10: TECHNICAL SESSIONS</b> <ul style="list-style-type: none"><li>• Supercritical Water Reactors—III</li><li>• Energy Conversion for Advanced Reactors—II</li><li>• Severe Accidents—I (Part B)</li><li>• Best Estimate Analysis Codes and Uncertainty Methodologies—II</li><li>• System Simulation Models and Codes—II</li><li>• Used Fuel Recycling Technologies—II</li><li>• Gas Reactor Materials Issues</li><li>• Key Licensing and Regulatory Issues for Small and Medium Reactors</li></ul>
4:00 PM – 6:00 PM	<b>ICAPP'10: PLENARY 3:</b> “An International Outlook on Nuclear Power”

# Embedded Topical Meeting: ICAPP'10 (Tuesday)

**TUESDAY, JUNE 15, 2010 • 8:00 A.M. – 10:00 A.M.**

## Plenary 2: Approach to Effective and Efficient Nuclear Power Regulation

Session Chairs: Peter Lyons (DOE), Akira Omoto (JAEC-Japan)

### San Diego Room

#### SPEAKERS:

- Nils Diaz (ND2)
- William Travers (FNAR-UAE)
- Choul Ho Yun (KINS-Korea)
- George Apostolakis (US NRC)
- Randy Edington (Arizona Public Service Company)

**TUESDAY, JUNE 15, 2010 • 10:00 A.M. – 12:00 P.M.**

## CFD Analysis and Optimization

Session Chair: Hans Gougar (INL)

### Pacific Salon 2

#### 10:00 a.m.

On Enhancing HTGR Lower Plenum Heat Transfer and Mixing via Swirling Jets, Sal B. Rodriguez (SNL, Univ of New Mexico), Mohamed S. El-Genk (Univ of New Mexico)

#### 10:20 a.m.

Shape Optimization of an Upper Plenum of a PBMR Using 3D-RANS Analysis and Surrogate Modeling, Sang-Moon Lee, Kwang-Yong Kim (Inha Univ)

#### 10:40 a.m.

Steady-State, Whole-Core Prismatic VHTR Simulation Including Core Bypass, W.D. Pointer, J.W. Thomas (ANL)

#### 11:00 a.m.

Steady-State, Whole-Core VHTR Simulation with Consistent Coupling of Neutronics and Thermo-fluid Analysis, J.W. Thomas, C.H. Lee, W.D. Pointer, W.S. Yang (ANL)

#### 11:20 a.m.

A Practical Method for Thermal Analysis and Design of Prismatic Fuel Blocks, Nam-il Tak, Min-Hwan Kim, Hong-Sik Lim (KAERI)

## Lead-Cooled Fast Reactors

Session Chairs: Stefano Monti (ENEA), Craig Smith (Naval Postgraduate School)

### Pacific Salon 3

#### 10:00 a.m.

The FP7 Central Design Team Project: Towards a Fast-spectrum Transmutation Experimental Facility, D. De Bruyn, P. Baeten (SCK•CEN), S. Larmignat, A. Woaye-Hune (AREVA), L. Mansani (ANSALDO)

#### 10:20 a.m.

A Combined Spiral Tube Steam Generator – Primary Pb Pump Unit Study for a DEMO LFR, L. Zou (Univ of Illinois at Urbana-Champaign), A. Moiseyev, J.J. Sienicki (ANL)

#### 10:40 a.m.

Transient Evaluation of a GEN IV LFR Demonstration Plant through a Lumped Parameters Analysis of Coupled Kinetics and Thermal-Hydraulics, Sara Bortot (INL, Politecnico di Milano), Antonio Cammi, Rasha Ghazy, Marco E. Ricotti (Politecnico di Milano), Patrizio Console Camprini (Univ of Bologna), Carlo Artioli (National Agency for the New Technologies, Energy and Environment)

#### 11:00 a.m.

Uncertainty and Sensitivity Analysis for the HELIOS Loop within the LACANES Benchmark, Wadim Jaeger, Victor H. Sanchez Espinoza (Karlsruhe Institute of Technology)

#### 11:20 a.m.

Conceptual Design of a Commercial Accelerator Driven Thorium Reactor, Colin G. Fuller, Roger W. Ashworth (Aker Solutions)

## Reactor Physics Benchmark and Validation

Session Chair: Ben Forget (MIT)

### Pacific Salon 5

#### 10:00 a.m.

Benchmark Development in Support of Generation-IV Reactor Validation (IRPhEP 2010 Handbook), John D. Bess, J. Blair Briggs (INL)

#### 10:20 a.m.

Benchmarking CASMO-5 Against PNL Mixed Oxide Criticals, Zhiwen Xu, Kord Smith, Joel Rhodes (Studsvik Scandpower, Inc.)

#### 10:40 a.m.

Conceptual Design, Experiments, and Analysis for the Core of an FHR Test Reactor, Jeffrey E. Bickel, Michael R. Laufer, Linsen Li, Anselmo T. Cisneros, Per F. Peterson (Univ of California, Berkeley)

#### 11:00 a.m.

Assessment to Application of 4S Nuclear Design Methodology through Physics Benchmark Analyses for Leakage Dominant Cores, M. Kawashima (Toshiba Nuclear Engineering Services Corporation), Y. Tsuboi, A. Nagata (Toshiba Corporation)

#### 11:20 a.m.

Simulations of <sup>235</sup>U and <sup>239</sup>Pu Decay Heat Using Selected Beta Decay Data in the Framework of Reactor Antineutrino Experiments, V.M. Bui, M. Fallot, L. Giot, J. Martino, A. Porta, F. Yermia (SUBATECH (CNRS/IN2P3 – Univ of Nantes – Ecole des Mines de Nantes))

#### 11:40 a.m.

Reducing Neutron Fluence on the EPR Reactor Pressure Vessel Using a Heavy Reflector, Justin N. Byard, Seven O. Bader, Pedro B. Perez (AREVA NP)

## Integral and Separate Thermal Hydraulics Testing and Analysis-I

Session Chair: Nick Brown (Purdue Univ)

### Pacific Salon 4

#### 10:00 a.m.

Applicability of Sub-scale Integral Test Data and TRACG Computer Code to Loss-of-Coolant Accidents of Up-rated BWRs, James R. Fitch, Pradip Saha, Baris Sarikaya, Jens G. M. Andersen (GE Hitachi Nuclear Energy)

# Embedded Topical Meeting: ICAPP'10 (Tuesday)

## 10:20 a.m.

Visualization of Film and Breakup of Impinging Jet upon the Curvature Wall for Simulation of Safety Injection in SMART, Byung Soo Shin, Seungtae Lee, Yung Joo Ko, Tae Soon Kwon, Sung Jae Yi (KAERI)

## 10:40 a.m.

US EPR™ Containment Scaling Analysis Methodology, Shih-Ping Kao, Jesse Skinner, Robert Sanders (AREVA)

## 11:00 a.m.

Comparison of the DVI Line Break LOCA with the Equivalent Cold Leg Break with the ATLAS Facility, Ki-Yong Choi, Seok Cho, Kyoung-Ho Kang, Hyun-Sik Park, Yeon-Sik Kim, Won-Pil Baek (KAERI)

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## Structural Analysis and Design

Session Chairs: Ram Srinivasan (AREVA), Travis W. Knight (Univ of South Carolina)

### Pacific Salon 6

#### 10:00 a.m.

Evaluating Long-term Relaxation of High-strength Bolts Connections, Hwan-Seon Nah, Hyeon-Ju Lee, Kang-Seok Kim (KEPRI)

#### 10:20 a.m.

The Statistical Analysis of the Behavior of Slip critical joints Subjected to the Size of Bolt-holes, Kang-Seok Kim, Hwan-Seon Nah, Hyeon-Ju Lee (KEPRI), Kang-Min Lee (Chungnam National Univ)

#### 10:40 a.m.

Probabilistic Fracture Mechanics Application for Alloy 600 Components in PWRs, Jong-Dae Hong, Changheui Jang (KAIST)

#### 11:00 a.m.

The Effects of Fluid Structure Interactions on the Dynamic Characteristics of the Reactor Internals Structures of SMART, Jang-Won Lee, Sang Soon Cho, Dong-Ok Kim, Jin-Seok Park, Won-Jae Lee (KAERI)

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## Nuclear Energy and Global Environment-I

Session Chair: Koji Nagano (CRIEPI)

### Pacific Salon 7

#### 10:00 a.m.

The Future Role of Water Reactors in the 21st Century, C. Sawyer (Consultant), S. Bilbao y León (IAEA), M. Fuchs (EON), M. Kazimi (MIT), B. Guesdon (AREVA), A. Rao (IAEA), R. Sinha (BARC), Y. Yoshimoto (Hitachi)

#### 10:20 a.m.

The Competitiveness of Nuclear Power Generation in Comparison, Martin Taylor, Jan-Horst Keppler (OECD NEA)

#### 10:40 a.m.

Alternative Nuclear Energy Futures: Peak Electricity, Liquid Fuels, and Hydrogen, Charles Forsberg (MIT)

#### 11:00 a.m.

An Indirect Effect of Green Technology by Japanese LWRs, Kazuaki Yanagisawa (IAEA), Koji Nagano (CRIEPI)

## 11:20 a.m.

Deployment Scenario for Nuclear Electric Generation Revival in Italy in the Time Horizon 2020-2030, F. Vettrano, R. Calabrese (ENEA)

## 11:40 a.m.

Nuclear Power Technology for the Reduction of Korea's GHG Emissions, Seung-Su Kim, Kee-Hwan Moon, Ji-Hee Nam (KAERI)

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## Near Term Deployment-II

Session Chairs: Tom Mulford (EPRI), Jeffrey F. Hamel (EPRI)

### Pacific Salon 1

#### 10:00 a.m.

Near-term Objectives of the Works on the EUR Document, Comparison with the EPRI-URD, Pierre Berbey (EDF/SEPTEN), Pablo T. Leon Lopez (ENDESA)

#### 10:20 a.m.

Ice Thermal Storage Systems for LWR Supplemental Cooling and Peak Power Shifting, Haihua Zhao, Hongbin Zhang, Phil Sharpe (INL), Blaise Hamanaka (Mines Paristech), Wei Yan, WoonSeong Jeong (Texas A&M Univ)

#### 10:40 a.m.

Nuclear Supplier Assessment: How to Control the Nuclear Supply Chain Quality?, Alain Henckes (Bureau Veritas)

#### 11:00 a.m.

Using a Third Party for Nuclear Plant Civil Works-One of a Solution for Nuclear Safety, Alain Chandèze (Bureau Veritas)

#### 11:20 a.m.

Current Status of Leningrad NPP Construction with VVER Reactors (AES-2006 Design), Sergey Svetlov, Alexander Altshuller, Anatoly Molchanov, Alexander Kazarin, Alexander Kuzin (JSC SPAEP)

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## TUESDAY, JUNE 15, 2010 • 1:00 P.M. – 2:30 P.M.

### Supercritical Water Reactors-II

Session Chairs: Pradip Saha (GE-Hitachi Nuclear Energy), Thomas Schulenberg (Karlsruhe Institute of Technology)

### Pacific Salon 1

#### 1:00 p.m.

Recent Analyses of the HPLWR Three Pass Core, T. Schulenberg, J. Starflinger (Karlsruhe Institute of Technology IKET), C. Maraczy (Hungarian Academy of Sciences KFKI), J. Heinecke (AREVA NP GmbH), W. Bernnat (Univ of Stuttgart)

#### 1:20 p.m.

Core and Sub-channel Analysis of SCWR with Mixed Spectrum Core, X.J. Liu, T. Yang, X. Cheng (Shanghai Jiao Tong Univ)

#### 1:40 p.m.

CFD-Analysis of the Moderator Water Flow in the HPLWR, Claus Kunik, Aurélien Miotto, Thomas Schulenberg (Karlsruhe Institute of Technology)

# Embedded Topical Meeting: ICAPP'10 (Tuesday)

## 2:00 p.m.

CFD Analysis on the Influence of Wire Wrap Spacers on the Heat Transfer to Supercritical CO<sub>2</sub>, D.C. Visser, L. Chandra, J.A. Lycklama a Nijeholt (*NRG*), Y.Y. Bae (*KAERI*)

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## HTGR System and Thermal Fluid Analysis

Session Chair: Gerhard Strydom (*INL*)

### San Diego Room

#### 1:00 p.m.

Multi-Dimensional Column-to-Column Heat Transfer in VHTR Cores, Richard B. Vilim (*ANL*)

#### 1:20 p.m.

A Study on Bypass Flow Gap Distribution in a Prismatic VHTR Core, Min-Hwan Kim, Chang Keun Jo, Hong-Sik Lim (*KAERI*)

#### 1:40 p.m.

Coolant Distribution in the VHTR Prismatic Core, Richard B. Vilim (*ANL*)

#### 2:00 p.m.

Dynamic Response for High Temperature Gas-cooled Reactor with Indirect Closed Brayton Cycle, Wenlong Li, Zuoyi Zhang, Heng Xie, Yujie Dong (*Tsinghua Univ*)

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## Energy Conversion for Advanced Reactors-I

Session Chairs: Anton Moiseyev (*ANL*), Nicolas Alpy (*CEA*)

### Pacific Salon 3

#### 1:00 p.m.

International Collaboration on Development of the Supercritical Carbon Dioxide Brayton Cycle for Sodium-Cooled Fast Reactors under the Generation IV International Forum Component Design and Balance of Plant Project, J.J. Sienicki, A. Moiseyev, D.H. Cho (*ANL*), M. Thomas (*Bettis Atomic Power Laboratory-USA*), S.A. Wright, P.S. Pickard, G. Rochau (*SNL*), G. Rodriguez, G. Avakian, N. Alpy, D. Haubensack, L. Gicquel, N. Simon, F. Rouillard (*CEA/CADARACHE*), S. Kotake, N. Kishohara, Y. Sakamoto (*JAEA*), J.-B. Kim, J.E. Cha, J.H. Eoh (*KAERI*)

#### 1:20 p.m.

Engineering Performance of Supercritical CO<sub>2</sub> Brayton Cycles, Steven A. Wright, Ross F. Radel (*SNL*), Robert Fuller (*Barber Nichols Inc.*)

#### 1:40 p.m.

Supercritical CO<sub>2</sub> Brayton Cycle Coupled with a Sodium Fast Reactor: Na/CO<sub>2</sub> Interaction: Experiments and Interaction Modeling, L. Gicquel, C. Latge, N. Simon (*CEA*), Ph Hobbes (*Rouen Court of Appeal*), A. Saboni (*UPPA-IUT-LaTEP*), J.-C. Buvat (*INSA ROUEN*), J.-L. Gustin (*RHODIA*)

#### 2:00 p.m.

Conceptual Design of a Commercial Supercritical CO<sub>2</sub> Gas Turbine for the Fast Reactor Power Plant, Yasushi Muto, Takao Ishizuka, Masanori Aritomi (*Tokyo Institute of Technology*)

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## Severe Accidents-I: Experiments (Part A)

Session Chair: T. (Nithy) Nitheanandan (*AECL*)

### Pacific Salon 2

#### 1:00 p.m.

Experimental Investigation of Debris Effects on Pump Operation and Comparison with Existing Wear Models, Daniel Lewis (*Flouserve Corporation*)

#### 1:20 p.m.

Status of the SARNET Network on Severe Accidents, Jean-Pierre Van Dorsselaere (*IRSN*), Ari Auvinen (*VTT*), David Beraha (*GRS*), Patrick Chatelard (*IRSN*), Christophe Journeau (*CEA*), Ivo Kljenak (*Jozef Stefan Institute*), Bal Raj Sehgal (*KTH*), Th. Walter Tromm (*Karlsruhe Institute of Technology*), Roland Zeyen (*JRC IE*)

#### 1:40 p.m.

An ECO-NET Network of High Temperature Facilities Simulating Severe Accidents, Christophe Journeau, Pascal Piluso, Kamila Plevacova, Lionel Ferry (*CEA*), Monika Kiselova (*UJV*), Snezana Bakardjeva (*UACH*), Vaclav Tytrpekl (*UACH, CEA*), Igor Pozniak (*St Petersburg Electrotechnical Univ*), Vladimir Zhdanov, Viktor Baklanov (*NNC RK*), Thierry Wiss, David Bottomley (*JRC-ITU*)

#### 2:00 p.m.

High-Temperature Oxidation of Zircaloy-4 in Mixed Steam-Air and Steam-Nitrogen Atmospheres, Martin Steinbrück (*Karlsruhe Institute of Technology-Germany*), Nóra Vér (*AEKI*)

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## Best Estimate Analysis Codes and Uncertainty Methodologies-I

Session Chair: Jamal Abdelghany (*AREVA*)

### Pacific Salon 4

#### 1:00 p.m.

Code Development in Coupled PARCS/RELAP5 for Supercritical Water Reactor, Po Hu (*Shanghai Jiao Tong Univ*), Paul Wilson (*Univ of Wisconsin-Madison*)

#### 1:20 p.m.

Validation and Verification of Wall Heat Transfer Models of the SPACE Code Using Separate Effects Tests, Sang-Ki Moon, Jungwoo Kim (*KAERI*), Kyung Chul Seo (*Energy and Environment Systems Co.*), Ki-Yong Choi, Hyun-Sik Park, Kyung-Doo Kim (*KAERI*)

#### 1:40 p.m.

Integral Effect Experiments on 6 inch Cold-Leg SBLOCA using the ATLAS Facility, Seok Cho, Ki-Yong Choi, Hyun-Sik Park, Kyoung-Ho Kang, Yeon-SIK Kim, Kyoung-Du Kim, Won-Pil Baek (*KAERI*)

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## System Simulation Models and Codes-I

Session Chairs: Christophe Peniguel (*EDF*), Cristhian Galvez (*Univ of California at Berkeley*)

### Pacific Salon 5

#### 1:00 p.m.

Modeling and Simulation of the PB-AHTR using RELAP5-3D, Cristhian Galvez, Raymond Wang, Sahak Margossian, Sebastian Dionisio, Per F. Peterson (*Univ of California at Berkeley*)

# Embedded Topical Meeting: ICAPP'10 (Tuesday)

## 1:20 p.m.

A Coupled Calculation of System Thermal-hydraulics and Three-dimensional Reactor Kinetics for a 12-Finger CEA Drop Event in a Two-Loop PWR Plant, Jae Jun Jeong, Seung Wook Lee, Jin Young Cho, Bub Dong Chung (*KAERI*), Gyu-Cheon Lee (*KOPEC*)

## 1:40 p.m.

Thermal-hydraulics and Conjugate Heat Transfer Calculation in a Wire-Wrapped SFR Assembly, C. Peniguel, I. Rupp (*EDF R&D*), S. Rolfo (*School of MACE*), M. Guillaud (*INCKA*)

## 2:00 p.m.

Set-up of a Validation Strategy for the Coupled Code CFX/TRACE in the FLORIS Facility with the Aid of CFD Simulations, Davide Bertolotto (*PSI, EPFL*), Annalisa Manera, Petrov Victor, Wilhelm M. Bissels (*PSI*), Horst M. Prasser (*PSI, ETHZ*), Rakesh Chawla (*PSI, EPFL*)

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## Used Fuel Recycling Technologies-I

Session Chair: R.A. Borrelli (*Univ of California at Berkeley*)

### Pacific Salon 6

#### 1:00 p.m.

A High Voltage Head-End Process for Waste Minimization and Reprocessing of Coated Particle Fuel for High Temperature Reactors, Michael A. Fütterer (*European Commission JRC*), Frédéric von der Weid, Patrick Kilchmann (*selFrag AG*)

#### 1:20 p.m.

Investigation of Alternative Anode Materials for Electrolytic Reduction of Spent Oxide Fuels, J. Ruppert, K.S. Raja, M. Misra (*Univ of Nevada*)

#### 1:40 p.m.

Methodology for a Thermal Analysis of a Proposed SFR Transport Cask with the Thermal Code SYRTHES, C. Peniguel, I. Rupp, J.P. Schneider (*EDF*)

#### 2:00 p.m.

High Reliability Safeguards For Remote-Handled Nuclear Materials, R.A. Borrelli, Lance Kim, Edward Blandford (*Univ of California-Berkeley*), Yongsoo Hwang, Eung Ho Kim (*KAERI*), Per F. Peterson (*Univ of California-Berkeley*)

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## Regulatory Oversight of Construction and Vendor Inspection

Session Chair: John Tappert (*US NRC*)

Session Organizer: Aida Rivera-Verona (*US NRC*)

### Pacific Salon 7

#### PANELISTS:

- John Tappert (*US NRC*)
- Sebastien Limousin (*ASN*)
- Sungho Yang (*KINS*)

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## TUESDAY, JUNE 15, 2010 • 2:30 P.M. – 4:00 P.M.

### Supercritical Water Reactors-III

Session Chairs: Thomas Schulenberg (*Karlsruhe Institute of Technology*), Pradip Saha (*GE-Hitachi Nuclear Energy*)

#### Pacific Salon 1

##### 2:30 p.m.

Integration of In-Core Instrumentation into HPLWR, Christina Koehly (*Karlsruhe Institute of Technology*), Werner Meier (*AREVA NP*), Joerg Starflinger (*Karlsruhe Institute of Technology*)

##### 2:50 p.m.

Design Proposal and Parametric Study of the HPLWR Safety System, Marc Schlagenhauser, Thomas Schulenberg, Joerg Starflinger (*Karlsruhe Institute of Technology*), Dietmar Bittermann (*AREVA NP GmbH*), Michele Andreani (*PSI*)

##### 3:10 p.m.

Design and Stability Limits of the HPLWR Re-heater, Heiko Herbell, Andreas Class, Jörg Starflinger, Thomas Schulenberg (*Karlsruhe Institute of Technology*)

##### 3:30 p.m.

A Study on Thermo-Mechanical Behavior of a Fuel Rod in an SCWR Core, S. Higuchi, S. Sakurai (*TOSHIBA*)

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### Energy Conversion for Advanced Reactors-II

Session Chairs: Nicolas Alpy (*CEA*), France, Anton Moiseyev (*ANL*)

#### Pacific Salon 3

##### 2:30 p.m.

Brayton Power Cycles for Electricity Generation from Fusion Reactors, J.I. Linares (*UPCO*), L.E. Herranz (*CIEMAT*), B.Y. Moratilla (*UPCO*), I.P. Serrano (*UPCO*)

##### 2:50 p.m.

Extension of the Supercritical Carbon Dioxide Brayton Cycle for Application to the Very High Temperature Reactor, A. Moiseyev, J.J. Sienicki (*ANL*)

##### 3:10 p.m.

Potential Improvements of Supercritical CO<sub>2</sub> Brayton Cycle by Mixing Other Gases, Woo Seok Jeong, Jeong Ik Lee, Yong Hoon Jeong, Hee Cheon No (*KAIST*)

##### 3:30 p.m.

Comparison of Heat Exchanger Modeling with Data from CO<sub>2</sub>-to-CO<sub>2</sub> Printed Circuit Heat Exchanger Performance Tests, A. Moiseyev, J.J. Sienicki, D.H. Cho (*ANL*), M.R. Thomas (*Bettis Atomic Power Laboratory*)

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### Severe Accidents-I: Experiments (Part B)

Session Chair: T. (Nithy) Nitheanandan (*AECL*)

#### Pacific Salon 2

##### 2:30 p.m.

Results from the Fourth High-Pressure Melt Ejection Test Completed in the Molten Fuel Moderator Interaction Facility at Chalk River Laboratories, T. Nitheanandan, G. Kyle, R. O'Connor (*AECL*)

# Embedded Topical Meeting: ICAPP'10 (Tuesday)

## 2:50 p.m.

Aerosol Removal by Emergency Spray in PWR Containment, Emmanuel Porcheron, Pascal Lemaitre, Denis Marchand, Amandine Nuboer (*IRSN*)

## 3:10 p.m.

Gas Phase Reactions of Organic Iodine in Containment Conditions, Teemu Kärkelä (*VTT Technical Research Centre of Finland*), Joachim Holm (*Chalmers Univ of Technology*), Ari Auvinen, Riitta Zilliacus, Tuula Kajolinna, Unto Tapper (*VTT Technical Research Centre of Finland*), Henrik Glänneskog (*Vattenfall Power Consultant*), Christian Ekberg (*Chalmers Univ of Technology*)

## Best Estimate Analysis Codes and Uncertainty Methodologies-II

Session Chairs: Jamal Abdelghany (*AREVA*), Seungjin Kim (*The Pennsylvania State Univ*)

### Pacific Salon 4

#### 2:30 p.m.

TRACE Analysis of MSIV Closure Direct Scram Event for Lungmen ABWR, Jong-Rong Wang, Hao-Tzu Lin (*Institute of Nuclear Energy Research, Atomic Energy Council*), Wei-Chen Wang, Chunkuan Shih (*National Tsing Hua Univ*)

#### 2:50 p.m.

Uncertainty Analysis for Containment Response of US EPR Reactor to Large Break Loss-of-Coolant Accidents, Jamal M. Abdelghany, Robert P. Martin (*AREVA NP Inc.*)

#### 3:10 p.m.

Best Estimate Plus Uncertainty Analysis to Evaluate Safety Margin in Case of Large Break Loss of Coolant Accident, Mahendra Prasad, R.S. Rao, S.K. Gupta (*AERB*)

#### 3:30 p.m.

TRACE with Dynamic Model for Interfacial Area Concentration Prediction, Justin D. Talley, Seungjin Kim, John H. Mahaffy (*The Pennsylvania State Univ*), Stephen M. Bajorek, Kirk Tien (*US NRC*)

## System Simulation Models and Codes-II

Session Chair: Kune Y. Suh (*SNU*)

### Pacific Salon 5

#### 2:30 p.m.

High Power Natural Circulation SBLOCA Transient in LSTF (ROSA V): Simulation with TRACE5.0, V. Abella, S. Gallardo, G. Verdú (*Univ Politècnica de Valencia*)

#### 2:50 p.m.

Thermohydraulic and Conjugate Heat Transfer Analysis of a 1300 MW PWR Core Internal Baffle Structure, I. Rupp, C. Péniguel, M. Tommy-Martin (*EDF*)

#### 3:10 p.m.

Station Blackout Analysis of a Natural Circulation Reactor, Jagdish Prasad Tyagi, P. Munshi (*Indian Institute of Technology*), Mithilesh Kumar, H.G. Lele (*BARC*)

## Used Fuel Recycling Technologies-II

Session Chair: Sigitas Rimkevicius (*Lithuanian Energy Institute*)

### Pacific Salon 6

#### 2:30 p.m.

Preparation of Low O/M MOX Pellets for Fast Reactors using Carbothermic Reduction, Tatsutoshi Murakami, Masato Kato, Kiichi Suzuki (*JAEA*), Hiroki Uno (*Inspection Development Company*)

#### 2:50 p.m.

Effects of H<sub>2</sub>/H<sub>2</sub>O Ratio in the Sintering Atmosphere on the Sintering Behavior of MOX Pellets, Kentaro Takeuchi, Masato Kato (*JAEA*), Takeo Sunaoshi (*Inspection Development Company*)

#### 3:10 p.m.

Safety Analysis for Reuse and Transportation of RBMK Fuel Assemblies, Sigitas Rimkevicius, Eugenijus Uspuras, Darius Laurinavicius, Gintautas Dundulis (*Lithuanian Energy Institute*)

#### 3:30 p.m.

Electrochemical Properties of Molten Salt Systems Containing Multiple Fission Product Elements, S. Baral, K.S. Raja, M. Misra (*Univ of Nevada, Reno*)

## Key Licensing and Regulatory Issues for Small and Medium Reactors

Session Chair: Stewart Magruder (*US NRC*)

Session Organizer: John Smith (*US NRC*)

### Pacific Salon 7

#### 2:30 p.m.

Licensing Strategy for PRISM Sodium-Cooled Fast Reactors in the United States, Arielle Miller, Pradip Saha, Eric Loewen, Charles W. Bagnal, Jr (*GE Hitachi Nuclear Energy*)

#### 2:50 p.m.

Regulatory Activities for Design Certification of SMART (System Integrated Modular Advanced Reactor), Namduk Suh, Changwook Huh (*KINS*)

#### PANELISTS:

- Jim Kinsey (*INL*)
- Bill Reckley (*US NRC*)

**TUESDAY, JUNE 15, 2010 • 4:00 P.M. – 6:00 P.M.**

## Plenary 3: An International Outlook on Nuclear Power

Session Chairs: Mujid Kazimi (*MIT*), Atambir Rao (*IAEA-Austria*)

### San Diego Room

#### SPEAKERS:

- Regis Matzie (*Westinghouse*)
- Erepamo Osaisai (*Atomic Energy Agency-Nigeria*)
- Ratan Kumar Sinha (*BARC-India*)
- Kiyoshi Yamauchi (*MHI-Japan*)
- Mingguang Zheng (*SNTPC/SNERDI-China*)

# Embedded Topical Meeting: ICAPP'10 (Wednesday)

WEDNESDAY • JUNE 16, 2010

7:30 AM – 5:00 PM	MEETING REGISTRATION
8:00 AM – 10:00 AM	ICAPP'10: PLENARY 4: “Emerging and Future LWR Designs”
8:00 AM – 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:30 AM – 11:20 AM	ST-NH2: TECHNICAL SESSIONS
8:30 AM – 11:30 AM	2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS
8:30 AM – 11:30 AM	NFSM for NGNR: TECHNICAL SESSIONS
10:00 AM – 12:00 PM	ICAPP'10: TECHNICAL SESSIONS <ul style="list-style-type: none"><li>• Supercritical Water Reactors—I</li><li>• HTGR Accident Analysis</li><li>• Sodium-Cooled Fast Reactors—II</li><li>• Software and Digital I&amp;C Issues</li><li>• Risk Analysis and Risk Informed Applications</li><li>• Integral and Separate Thermal Hydraulics Testing and Analysis—II</li><li>• CFD Applications to Water, Liquid Metal and Gas Reactors—II</li><li>• Strategies for Sustainable Fuel Cycle</li></ul>
11:30 AM – 1:00 PM	MSTD AWARDS LUNCHEON
1:00 PM – 2:30 PM	ICAPP'10: TECHNICAL SESSIONS <ul style="list-style-type: none"><li>• Sodium-Cooled Fast Reactors—III</li><li>• Performance and Reliability Improvements (1:00 P.M. – 3:00 P.M.)</li><li>• Severe Accidents—II: Modeling (1:00 P.M. – 4:00 P.M.)</li><li>• Next Generation Reactor Design and Analysis</li><li>• Advances in Two-Phase Flow and Heat Transfer (1:00 P.M. – 3:00 P.M.)</li><li>• CFD Applications to Water, Liquid Metal and Gas Reactors—I</li><li>• LWR Materials Issues</li><li>• New Reactor Licensing in the US—Status and Projections</li></ul>
1:00 PM – 4:00 PM	2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS
1:00 PM – 4:20 PM	NFSM for NGNR: TECHNICAL SESSIONS
1:30 PM – 4:25 PM	ST-NH2: TECHNICAL SESSIONS
2:30 PM – 4:00 PM	ICAPP'10: TECHNICAL SESSIONS <ul style="list-style-type: none"><li>• HTGR Reactor Core Physics Methods</li><li>• Sodium-Cooled Fast Reactors—IV</li><li>• Light Water Reactor Analysis</li><li>• Materials for GenIV Reactors and Fusion Systems</li><li>• New Reactor Siting Issues</li></ul>
4:00 PM – 6:00 PM	ICAPP'10: PLENARY 5: “Global Nuclear Energy Opportunities and Challenges”
4:15 PM – 5:15 PM	ANS BUSINESS MEETING
4:30 PM – 6:30 PM	FOCUS ON COMMUNICATIONS WORKSHOP
6:00 PM – 10:30 PM	EVENING EVENT “Dinner Cruise on the Hornblower”
7:00 PM – 9:00 PM	NFSM for NGNR: POSTER SESSION

WEDNESDAY, JUNE 16, 2010 • 10:00 A.M. – 12:00 P.M.

## Supercritical Water Reactors-I

Session Chair: Sama Bilbao y Leon (IAEA)

### Pacific Salon 1

10:00 a.m.

Numerical Investigation of Supercritical Water Cooling Channel Flows around a Single Rod with a Wrapped Wire, Yu Zhu, Eckart Laurien (IKE, Univ Stuttgart)

10:20 a.m.

Supercritical Heat Transfer Correlation for Carbon Dioxide Flowing Upward in a Vertical Tube, S.J. Mokry, I.L. Pioro, A. Farah, K. King (Univ of Ontario Institute of Technology)

10:40 a.m.

Improving the Understanding of Thermal-Hydraulics and Heat Transfer for Super Critical Water Cooled Reactors, Sama Bilbao y Leon, Nusret Aksan (IAEA)

11:00 a.m.

Development of Numerical Wall-Functions to Model the Heat Transfer of Supercritical Fluids, Eckart Laurien (Univ of Stuttgart, IKE)

11:20 a.m.

Mixed Convection Heat Transfer to Supercritical Carbon Dioxide in a Vertical Circular Heated Tube, Yoon-Yeong Bae, Tae-Ho Yoo, Hwan-Yeol Kim (KAERI)

11:40 a.m.

High Performance Light Water Reactor Transient Analysis with Neutronics Feedback Using TRAB-3D and SMABRE Codes, Malla Seppälä, Anitta Hämäläinen, Antti Daavittila (VTT Technical Research Centre of Finland)

## HTGR Accident Analysis

Session Chair: Chang Oh (INL)

### Pacific Salon 2

10:00 a.m.

Failure of Oxidized Graphite Support Column in VHTR, Byung Ha Park, Hee Cheon No (KAIST)

10:20 a.m.

RELAP5 and CATHARE2 Benchmarking Assessment on Two LOFA Transients Conducted in HE-FUS3 Helium Facility, Paride Meloni, Massimiliano Polidori (ENEA), Luciana Barucca, Marco Gregorini (ANSALDO), Geffraye Geneviève, Vladimir Kalitvianski (CEA), Francois Cochemé, Ludovic Maas (IRSN)

10:40 a.m.

On Modes and Kinetics of Nuclear Graphite Oxidation in Massive Air or Steam Ingress, Mohamed S. El-Genk, Jean-Michel P. Tournier (Univ of New Mexico)

11:00 a.m.

Sensitivity of HTGRs Source Term Estimates to Uncertainties in the Radiological Blow-down into the Confinement Building, Joan Fontanet, Luis Herranz (CIEMAT), Alastair Ramlakan (PBMR (Pty) Ltd.)

WEDNESDAY, JUNE 16, 2010 • 8:00 A.M. – 10:00 A.M.

## Plenary 4: Emerging & Future LWR Designs

Session Chairs: Goon-Cherl Park (SNU, President of KNS-Korea), Jack Tuohy (ANS)

### San Diego Room

#### SPEAKERS:

- Kiyoshi Okamura (Toshiba-Japan)
- Paul Lorenzini (NuScale)
- Hark Rho Kim (KAERI-Korea)
- Jeff Halfinger (Babcock & Wilcox)
- Atambir Rao (IAEA-Austria)

# Embedded Topical Meeting: ICAPP'10 (Wednesday)

## 11:20 a.m.

MELCOR Fission Product Release Model for HTGRs, Michael F. Young (*Sandia National Laboratories*), Hossein Esmaili (*US NRC*), Randall Gauntt (*Sandia National Laboratories*), Sudamay Basu, Richard Lee, Stuart Rubin (*US NRC*)

## 11:40 a.m.

Effects of Geometric Parameters on Lock Exchange and Buoyancy Driven Exchange Flow, Suchismita Sarangi, Justin D. Talley, Rachael Sakurai, Jenna J. Baird, James P. Spring, Seungjin Kim (*The Pennsylvania State Univ*), Andrew J. Ireland, Stephen M. Bajorek (*US NRC*)

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## Sodium-Cooled Fast Reactors-II

*Session Chairs:* James J. Sienicki (*ANL*), David Wade (*Advanced Reactor Concepts*)

### Pacific Salon 3

#### 10:00 a.m.

Overall Optimization Methodology for Sodium-cooled Fast Reactor Core Conception, Damien Schmitt, Simone Massara, Thomas Jourdeuil, Philippe Tetart, Tanguy Courau (*EDF*)

#### 10:20 a.m.

Sodium-Cooled Fast Reactor Core Designs for Transmutation of MHR Spent Fuel, Ser Gi Hong (*KAERI*), Yong-Hee Kim (*Ulsan National Institute of Science and Technology*), Francesco Venneri (*LOGOS Technologies*)

#### 10:40 a.m.

Power Flattening of CANDU Fast Reactor by Adding Thorium in Inner Core, Hiroshi Sekimoto, Sinsuke Nakayama, Hiroshi Taguchi, Tsuyoshi Ohkawa (*Tokyo Institute of Technology*)

#### 11:00 a.m.

Preliminary Flow Optimization of Core Sub-assemblies in French Sodium-cooled Fast Reactors, B. Valentin, L. Buiron (*CEA DEN*), D. Verrier (*AREVA NP*), S. Massara (*EDF R&D SINETICS*)

#### 11:20 a.m.

An Innovative Particulate Metallic Fuel for Next Generation Nuclear Energy, L. Walters, D. Wade (*Advanced Reactor Concepts*), G. Hofman (*ANL*)

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## Software and Digital I&C Issues

*Session Chair:* Steve Yang (*AREVA*)

### San Diego Room

#### 10:00 a.m.

Software Safety Analysis Application in Installation Phase, Hui-Wen Huang (*INER*), Swu Yih (*Ching Yun Univ*), Li-Hsin Wang, Ben-Ching Liao (*INER*), Lin Jiin-Ming (*Taiwan Power Company*), Tsu-Mu Kao (*INER*)

#### 10:20 a.m.

Tracing Software Requirements of Digital I&C Systems, Steve Yang, Robert Moniri, Mike Fillian, Li Shi (*AREVA NP*)

#### 10:40 a.m.

Soft Error Reduction in FPGAs for Digital I&C in Nuclear Power Plants, Rahul Puri, Keith E. Holbert, Lawrence T. Clark (*Arizona State Univ*)

## 11:00 a.m.

Licensing Experience of the Evaluation of Surveillance Test for Digital I&C Systems Important to Safety, Seonghyon Ji, DAI I. Kim (*KINS*)

## 11:20 a.m.

Using Neuro-Fuzzy Based Approach for the Evaluation of Turbine-Generator Outputs, Yea-Kuang Chan, Chun-Chang Lu, Chin-Jang Chang, Lainsu-Kao (*INER*), Li-Chiang Hong (*Chinshan Nuclear Power Station, Taipower Company*)

## 11:40 a.m.

Design of Conventional Panels Based on Task Analysis in a Computerized Main Control Room, Luis Rejas (*Tecnatom*)

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## Risk Analysis and Risk Informed Applications

*Session Chair:* Kyle G. Metzroth (*The Ohio State Univ*)

### Pacific Salon 7

#### 10:00 a.m.

Dynamic Event Tree Analysis as a Risk Management Tool, Kyle Metzroth, Richard Denning, Tunc Aldemir (*Ohio State Univ*)

#### 10:20 a.m.

Scenario Aggregation and Analysis via Mean-Shift Methodology, Diego Mandelli, Alper Yilmaz, Kyle Metzroth, Tunc Aldemir, Richard Denning (*The Ohio State Univ*)

#### 10:40 a.m.

Seismic Risk Evaluation within the Technology Neutral Framework, B.C. Johnson, G.E. Apostolakis (*MIT*)

#### 11:00 a.m.

Approaches to NPP I&C Systems Dependability Assessment: Analysis and Implementation, Vyacheslav Kharchenko, Eugene Babeshko, Vladimir Sklyar (*Centre for Safety Infrastructure-Oriented Research and Analysis*), Alexander Siora, Viktor Tokarev (*Research and Production Company "RADII"*)

#### 11:20 a.m.

Deterministic CCF Analysis for Achieving Sufficiently Diverse Design of NPP Safety Systems, Joerg Blombach (*Consultant*), Stefan Bordihn (*AREVA NP GmbH*)

#### 11:40 a.m.

Development of a Strategy for Implementation of Risk Monitors at Russian NPPs, Bronislav Vinnikov (*RRC Kurchatov Institute*)

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## Integral and Separate Thermal Hydraulics Testing and Analysis-II

*Session Chair:* Nick Brown (*Purdue Univ*)

### Pacific Salon 4

#### 10:00 a.m.

Status of the Full Scale Component Testing of the KERENATM Emergency Condenser and Containment Cooling Condenser, Stephan Leyer, Fabian Maisberger, Vassili Herbst, Mathias Doll, Michael Wich, Thomas Wagner (*AREVA NP GmbH*)

# Embedded Topical Meeting: ICAPP'10 (Wednesday)

## 10:20 a.m.

A Study on the Steady-State and Transient Behavior of Natural Circulation in REX-10, Byeong-Ill Jang (*Hanyang Univ*), Moo-Hwan Kim (*Pohang Univ of Science and Technology*), Gyoo-Dong Jeun (*Hanyang Univ*)

## 10:40 a.m.

Design Experimental Facility for SMART Flow Mixing Header Assembly, Jong-Soo Choi, Jong-Won Kim (*Seoul National Univ*), Young-In Kim (*KAERI*), Goon-Cherl Park (*Seoul National Univ*)

## 11:00 a.m.

Analysis of PAFS (Passive Auxiliary Feedwater System) Horizontal Heat Exchanger in APR+ and Scale-up Capability of Experimental Loop, Byoung-Uhn Bae, Byong-Jo Yun, Sung-Won Bae, Ki-Yong Choi, Chul-Hwa Song (*KAERI*), Jong Cheon (*KHNP*)

## 11:20 a.m.

A New Integral Facility PWR PACTEL for Vertical Steam Generator Simulation, Antti Rantakaulio, Virpi Kouhia, Vesa Riikonen, Antti Räsänen, Heikki Purhonen, Riitta Kyrki-Rajamäki (*Lappeenranta Univ of Technology*)

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## CFD Applications to Water, Liquid Metal and Gas Reactors-II

Session Chairs: Kazuyuki Takase (*JAEA*), Juliette Cahen (*CEA*)

### Pacific Salon 5

#### 10:00 a.m.

Proper Orthogonal Decomposition of the Flow in a T-junction, E. Merzari, W.D. Pointer, P. Fischer (*ANL*)

#### 10:20 a.m.

Numerical Investigation on Melting Characteristics of Minuteness Metal Powders by Laser Welding, Kazuyuki Takase, Takahisa Shobu, Kazuyuki Tsukimori, Toshiharu Muramatsu (*JAEA*)

#### 10:40 a.m.

Parametric Investigation on the Mechanical Loads Induced by Liquid Droplet Impingement onto a Rigid Wall, Jinbiao Xiong, Seiichi Koshizuka, Mikio Sakai (*The University of Tokyo*)

#### 11:00 a.m.

Interaction of Computational Tools for Multiscale Multiphysics Simulation of Generation-IV Reactors, I.A. Bolotnov, F. Behafarid, D. Shaver (*Rensselaer Polytechnic Institute*), T. Guo, S. Wang, H. Wei (*Stony Brook Univ*), S.P. Antal, K.E. Jansen (*Rensselaer Polytechnic Institute*), R. Samulyak (*Stony Brook Univ, Brookhaven National Laboratory*), M.Z. Podowski (*Rensselaer Polytechnic Institute*)

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## Strategies for Sustainable Fuel Cycle

Session Chairs: Michael Todosow (*BNL*), Temitope Taiwo (*ANL*)

### Pacific Salon 6

#### 10:00 a.m.

Thorium Based Fuel Cycle Options for PWRs, Michael Todosow, Gilad Raitzes (*BNL*)

#### 10:20 a.m.

Collocation and Integration of Reprocessing, Fabrication, and Repository Facilities to Reduce Closed Fuel Cycle Costs and Risks, C.W. Forsberg (*MIT*), L.R. Dole (*ORNL*)

## 10:40 a.m.

Usage of Thorium Based Nuclear Fuel in VVER Reactors, Jan Frýbort, Radim Vočka (*Nuclear Research Institute Rez*)

## 11:00 a.m.

Investigation on the Feasibility of Thorium Breeder Reactor in a BWR, Yoshitaka Funahashi, Yoichiro Shinazu, Tadashi Narabayashi, Masashi Tsuji (*Hokkaido Univ*)

## 11:20 a.m.

Current Progress in On-line Reprocessing Technology of Molten Salt Reactor Systems, Jan Uhlir, Martin Straka, Michal Korenko (*Nuclear Research Institute Rez*)

## 11:40 a.m.

Advanced Nuclear Fuel Cycle Options, Roald Wigeland (*INL*), Temitope Taiwo (*ANL*), Michael Todosow (*BNL*), William Halsey (*LLNL*), Jess Gehin (*ORNL*)

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## WEDNESDAY, JUNE 16, 2010 • 1:00 P.M. – 2:30 P.M.

### Sodium-Cooled Fast Reactors-III

Session Chair: Yoshitaka Chikazawa (*JAEA*)

### Pacific Salon 3

#### 1:00 p.m.

On the Numerical Simulation of Thermal Striping in the Upper Plenum of a Fast Reactor, E. Merzari, W.D. Pointer, A. Obabko, P. Fischer (*ANL*)

#### 1:20 p.m.

Preconceptual Design of a Sodium Component Test Complex, Gregory A. Johnson, Michael W. McDowell (*Pratt & Whitney - Rocketdyne*), Christopher W. Grandy, James J. Sienicki (*ANL*), Sherree Shaw (*CH2M Hill*)

#### 1:40 p.m.

MEGAPIE Spallation Target: Synthesis of the Experimental and Operational Feedback of the Use of Lead-Bismuth Eutectic for Innovative SFR, Ch. Latge (*CEA*), M. Wohlmuther, K. Thomsen, W. Wagner (*PSI*)

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### Performance and Reliability Improvements\* (until 3pm)

Session Chairs: Michael Ostrelch (*ATC Nuclear*), Richard Kaylor (*ATC Nuclear*)

### Pacific Salon 1

#### 1:00 p.m.

Project of Modernization and Power Uprate Developed by Iberdrola at Laguna Verde NPP, Alejandro Merino Teillet, Jose Luis García Serrano, Ignacio Martinez Gozalo, Beatriz Liebana Martinez (*IBERDROLA*)

#### 1:20 p.m.

Evaluation of Level Uncertainty for Uljin Units 1&2 Steam Generator due to the Thermal-Hydraulic Operating Condition Change, In Hwan Kim, Jae Yong Lee (*KEPRI*)

#### 1:40 p.m.

Innovating the Differential Pressure Switch, Michael Ostrelch (*ATC Nuclear-USA*)

# Embedded Topical Meeting: ICAPP'10 (Wednesday)

## 2:00 p.m.

Advanced Core Protection Calculator System Algorithm For Shin-Ulchin 1&2, Tae-Young Yoon, Dae-Jin Lee (*KNF*), Wang-Kee In (*KAERI*), Jong-Sik Bae (*Doosan Heavy Industries & Construction Co*)

## 2:20 p.m.

Development of Position Detection Method for an Underwater Vehicle Used in Reactor Core Internal Inspection, Ryosuke Kobayashi, Satoshi Okada, Masahiro Tooma (*Energy and Environmental Systems Laboratory, Hitachi*)

## 2:40 p.m.

Over Pressure Protection System of Moisture Separator Reheater, Jun Manabe, Kazumi Yamamoto, Kaku Fujita, Yoshinori Imaji (*Mitsubishi Heavy Industries*)

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## Severe Accidents-II: Modeling

Session Chair: Martin Steinbrück (*KIT*)

### San Diego Room

#### 1:00 p.m.

Analytical Study on Core Melt Retention in a Core Catcher, Ryoichi Hamazaki (*Isogo Nuclear Engineering Center, Toshiba*), Takahiro Nakagawa (*Toshiba Plant Systems and Services Corporation*), Mika Tahara, Yuka Suzuki, Toshimi Tobimatsu, Tomohisa Kurita (*Power & Industrial Systems R&D Center, Toshiba*)

#### 1:20 p.m.

SCDAPSIM/RELAP5 Investigation on In-Vessel Corium Retention for CANDU 6 Plant, Daniel Dupleac (*Politehnica Univ of Bucharest*), Mirea Mladin (*Institute for Nuclear Research*), Ilie Prisecaru, Gheorghe Negut (*Politehnica Univ of Bucharest*)

#### 1:40 p.m.

Simulation of SERENA KROTOS Steam Explosion Experiments with the MC3D Code, Matjaž Leskovar, Mitja Uršič (*Jožef Stefan Institute*)

#### 2:00 p.m.

Direct Containment Heating (DCH) in European PWR – COCOSYS Model Development for Melt Entrainment and Application to DISCO-Experiments, C. Spengler (*GRS*)

#### 2:20 p.m.

Performance of Horizontal U-tube Type Passive Containment Cooling System in a BWR, Yoshihiro Kojima, Kenji Arai, Tomohisa Kurita, Hirohide Oikawa, Makoto Akinaga, Toshimi Tobimatsu, Hiromasa Yanagisawa, Mika Tahara, Ryoichi Hamazaki (*Toshiba*)

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## Next Generation Reactor Design and Analysis

Session Chair: Anne Nicolas (*CEA*)

### Pacific Salon 2

#### 1:00 p.m.

A Break Even Oxide Fuel Core for an Innovative Sodium-Cooled French Fast Reactor: Core Flexibility, L. Buiron (*CEA*), D. Verrier, A.C. Scholer (*AREVA NP*), S. Massara, T. Jourdeuil (*EDF R&D*)

#### 1:20 p.m.

Neutronics Design of a Thorium-Fueled Fission Blanket for LIFE (Laser Inertial Fusion Energy), Jeffrey J. Powers (*Univ of California at Berkeley, LLNL*), Ryan Abbott, Massimiliano Fratoni (*LLNL*), Kevin Kramer (*Univ of California at Berkeley, LLNL*), Jeffery Latkowski (*LLNL*), Jeffrey Seifried (*Univ of California at Berkeley, LLNL*), Janine Taylor (*LLNL*)

#### 1:40 p.m.

A Coupled 3D Neutron Kinetics / Thermal-Hydraulics Model of the Generation IV Sodium-Cooled Fast Reactor, A. Chenu, K. Mikityuk, R. Chawla (*PSI*)

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## Advances in Two-Phase Flow and Heat Transfer\* (until 3pm)

Session Chair: Donna Post Guillen (*INL*)

### Pacific Salon 4

#### 1:00 p.m.

A Study on the Root Cause Identification of Local Wall Thinning Caused by Deflected Turbulent Flow Inside Orifice of Carbon Steel Components, Sang Hun Park, Kyung Hoon Kim (*KyungHee Univ*), Kyeong Mo Hwang (*KOPEC*)

#### 1:20 p.m.

Modeling of Friction Pressure Drop for Sodium Two-Phase Flow in Round Tubes, A. Chenu (*PSI/EPFL*), K. Mikityuk (*PSI*), R. Chawla (*PSI/EPFL*)

#### 1:40 p.m.

Local Liquid Velocity and Temperature for Subcooled Boiling Flow in a Vertical Annulus and Evaluation of Interfacial Drag Models, Byong-Jo Yun, Byoung-Uhn Bae, Dong-Jin Euh, Won-Man Park, Chul-Hwa Song (*KAERI*)

#### 2:00 p.m.

Condensation Correlations for Light Water Reactors, Shripad T. Revankar (*Purdue Univ*)

#### 2:20 p.m.

Comparative Experimental and Numerical Analysis of the Hydraulic Behaviour of Free-Surface Flow in the Water Experiment of the XT-ADS Windowless Spallation Target, A. Batta, A. Class (*KIT*), H. Jeanmart (*UCL*)

#### 2:40 p.m.

Investigation of Thermal Conductivity of Nanofluids with Liquid Gallium as Base Fluid for Nuclear Applications, Seung Won Lee, Sung Dae Park, Sarah Kang, In Cheol Bang, Ji Hyun Kim (*Ulsan National Institute of Science and Technology (UNIST)*)

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## CFD Applications to Water, Liquid Metal and Gas Reactors-I

Session Chairs: Juliette Cahen (*CEA*), Kazuyuki Takase (*JAEA*)

### Pacific Salon 5

#### 1:00 p.m.

Development and Validation of a CFD Model for the EPR Pressure Vessel, V. Petrov, A. Manera (*PSI*)

## Embedded Topical Meeting: ICAPP'10 (Wednesday)

### 1:30 p.m.

Numerical Analysis of the Onset of Heat Transfer Deterioration to Supercritical Water, Henryk Anglart (*Royal Institute of Technology*)

### 1:50 p.m.

U-RANS Simulation of Unsteady Eddy Motion in Pipe Elbow at High Reynolds Number Conditions, Masa-aki Tanaka, Hiroyuki Ohshima, Hidemasa Yamano, Kosuke Aizawa (*JAEA*), Tatsuya Fujisaki (*NDD Corporation*)

### 2:10 p.m.

Calculation of Debris Particle Transport on Containment Floor Using Shallow Water Equation, Young Seok Bang, Gil-Soo Lee, Deog-Yeon Oh, Sweng-Woong Woo (*KINS*)

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### LWR Materials Issues

Session Chairs: Ill-Seok Jeong (*KEPRI*), Kenneth Geelhood (*PNNL*)

### Pacific Salon 6

#### 1:00 p.m.

Analysis of Control Rod Behavior Based on Numerical Simulation, Dong-Geun Ha, Joon-Kyoo Park, Nam-Gyu Park, Jung-Min Suh, Kyeong-Lak Jeon (*Korea Nuclear Fuel*)

#### 1:20 p.m.

Evaluation of Instability of Laminated Rubber Bearings under Dynamic Loading, R.L. Frano, G. Forasassi (*DIMNP Univ of Pisa*)

#### 1:40 p.m.

High Temperature Electro-Mechanical Devices for Nuclear Applications, D. Robertson (*Rolls-Royce Civil Nuclear*)

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### New Reactor Licensing in the US – Status and Projections

Session Chair: Dave Matthews (*US NRC*)

### Pacific Salon 7

- Mark Tonacci (*US NRC*)

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### WEDNESDAY, JUNE 16, 2010 • 2:30 P.M. – 4:00 P.M.

### HTGR Reactor Core Physics Methods

Session Chairs: Madeline Feltus (*US DOE*), Volkan Seker (*Univ of Michigan*)

### Pacific Salon 2

#### 2:30 p.m.

Quantification of TRISO Heterogeneity Effects in HTGR Lattice Physics Calculations, Christopher M. Perfetti, Samim Anghaie, Edward Dugan (*Univ of Florida*), Thomas Marcille (*LANL*)

#### 2:50 p.m.

Core Optimization of a Deep-Burn Pebble Bed Reactor, B. Boer, A.M. Ougouag (*INL*)

### 3:10 p.m.

An Evaluation of Dancoff Factor for Pebble-type Reactor Using Monte Carlo Method, Song Hyun Kim, Hong-Chul Kim (*Hanyang Univ*), Jea Man Noh (*KAERI*), Jong Kyung Kim (*Hanyang Univ*)

### 3:30 p.m.

Use of Thorium Blankets in a Pebble Bed Advanced High Temperature Reactor, Anselmo T. Cisneros, Ehud Greenspan, Per F. Peterson (*Univ of California at Berkeley*)

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### Sodium-Cooled Fast Reactors-IV

Session Chair: Michael McDowell (*Pratt & Whitney – Rocketdyne*)

### Pacific Salon 3

#### 2:30 p.m.

Generation IV Nuclear Reactors: Strategy and Challenges of R&D Program for Improving Inspection and Repair of Sodium Cooled Systems, J. Sibilo, E. Breuil (*AREVA NP*), F. Baqué (*CEA*), J.M. Augem (*EDF SEPTEN*)

#### 2:50 p.m.

Development of the Main Components for JSFR, Kazuya Kurome, Hisatomo Murakami (*Mitsubishi Heavy Industries, Ltd.*), Yoshihiro Tsujita (*Mitsubishi FBR Systems, Inc.*), Satoshi Futagami, Hiroki Hayafune (*JAEA*)

#### 3:10 p.m.

Endurance Sodium Experiment of Selector-Valve for Failed Fuel Detection and Location System in Sodium-Cooled Large Reactor, Kosuke Aizawa, Kaoru Fujita, Shingo Hirata (*JAEA*), Naoto Kasahara (*JAEA/Univ of Tokyo*)

#### 3:30 p.m.

Development of Control Rod Programming for Power Maneuvering of a SFR, Seung-Hwan Seong, Han-Ok Kang, Seong-O Kim (*KAERI*)

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### Light Water Reactor Analysis

Session Chair: Christine Poinot-Salanon (*CEA*)

### Pacific Salon 5

#### 2:30 p.m.

Loading Pattern Optimization with Maximum Utilization of Discharging Fuel Employing Adaptively Constrained Discontinuous Penalty Function, Tong Kyu Park, Han Gyu Joo, Chang Hyo Kim (*Seoul National Univ*)

#### 2:50 p.m.

Analysis of the Influence of the Thermalhydraulic to Neutronic Mapping in the RIA Analysis in Almaraz NPP, T. Barrachina, M. García-Fenoll, F. Anchel, R. Miró, G. Verdú (*UPV*), A. Ortego (*IBERINCO*), J.C. Martínez-Murillo (*Almaraz-Trillo AIE*)

#### 3:10 p.m.

A New Methodology to Obtain the 1D Cross-sections for TRAC-BF1 Code: Application to Peach Bottom NPP, T. Barrachina, R. Miró, G. Verdú (*Univ Politècnica de València*), I. Collazo, P. González, A. Concejal, P. Ortego, J. Melara (*IBERINCO*)

# Embedded Topical Meeting: ICAPP'10 (Wednesday/Thursday)

## Materials for Gen IV Reactors and Fusion Systems

Session Chair: Djamel Kaoumi (*Univ of South Carolina*)

### Pacific Salon 6

2:30 p.m.

Developing a Nuclear Grade of Alloy 617 for Gen IV Nuclear Energy Systems, Weiju Ren (*ORNL*), Robert W. Swindeman (*Cromtech*), Michael L. Santella (*ORNL*)

2:50 p.m.

Evaluation of Fracture Toughness of F82H Steels Added with Phosphorus by Small Specimen Test Technique, Byung Jun Kim, Ryuta Kasada, Akihiko Kimura (*IAE, Kyoto Univ*), Hiroyasu Tanigawa (*JAEA*)

3:10 p.m.

Microstructure and Mechanical Properties of Solid State Diffusion Bonded ODS Ferritic Steels, Sanghoon Noh, Ryuta Kasada, Akihiko Kimura (*Kyoto Univ*)

3:30 p.m.

Characterization of Candidate Materials in SCWR Conditions – Estimation of Kinetic Parameters of Individual Corrosion Layer Constituents, Sami Penttila (*VTT Technical Research Centre*), Iva Betova (*Technical Univ of Sofia*), Martin Bojinov (*Univ of Chemical Technology and Metallurgy*), Petri Kinnunen, Aki Toivonen (*VTT Technical Research Centre*)

## New Reactor Siting Issues

Session Chair: Scott Flanders (*US NRC*)

Session Organizer: Carolyn Lauron (*US NRC*)

### Pacific Salon 7

PANELISTS:

- New Reactor Siting Issues, Clifford Munson (*US NRC*)
- Seismic Isolation, Shinjiro Hikada (*JNES*)
- Seismic Back Check Status to the New Seismic Review Guide in Japan, Yuichi Uchiyama (*JNES*)
- Western U.S. Seismic Siting Issues, Jon Ake (*US NRC*)
- International Perspectives on the Regulation of Site Selection and Preparation, Philip Webster (*CNSC*)

WEDNESDAY, JUNE 16, 2010 • 4:00 P.M. – 6:00 P.M.

## Plenary 5: Global Nuclear Energy Opportunities and Challenges

Session Chairs: Yasuo Yoshinari (*Hitachi-GE-Japan*),

Samim Anghaie (*Consultant*)

### San Diego Room

SPEAKERS:

- Chang Sun Kang (*SNU-Korea*)
- Ashok Passiricha (*US Ex-Im Bank*)
- Dipinder Saluja (*Capricorn Investment Group*)
- Georges Serviere (*EDF-France*)
- Khaled Toukan (*Jordan Atomic Energy Authority-Jordan*)

THURSDAY • JUNE 17, 2010

7:30 AM – 2:00 PM MEETING REGISTRATION

8:00 AM – 10:00 AM ICAPP'10: PLENARY 6:  
“Nuclear Fuel Cycle Options Perceptions and Realities”

8:30 AM – 10:15 AM ST-NH2: TECHNICAL SESSION

8:30 AM – 11:30 AM 2010 ANS ANNUAL MEETING: TECHNICAL SESSIONS

8:30 AM – 11:30 AM NFSM for NGNR: TECHNICAL SESSIONS

10:00 AM – 12:00 PM ICAPP'10: TECHNICAL SESSIONS

- Pressurized Water Reactors
- Sodium-Cooled Fast Reactors—V
- Operational Experience
- Severe Accidents—III: Plant Studies
- Advanced Reactor Testing and Analysis—I
- Thermal Hydraulics Measurement and Modeling Fundamentals
- Nuclear Waste Management
- Materials Irradiation and Facilities

1:00 PM – 3:00 PM ICAPP'10: TECHNICAL SESSIONS

- Sodium-Cooled Fast Reactors—VI
- Generic/Longer Term Concepts
- LOCA and non-LOCA Safety Analyses (1:00 – 4:00 PM)
- Advances in Regulatory Issues
- Advanced Reactor Testing and Analysis—II
- Materials Modeling and Testing
- Nuclear Energy and Global Environment—II

1:00 PM – 4:00 PM NFSM for NGNR: TECHNICAL SESSIONS

1:00 PM – 5:00 PM TECHNICAL TOUR:

“DIII-D, Urban Maglev and Algae Biodiesel Facilities”  
(at General Atomics)

THURSDAY, JUNE 17, 2010 • 8:00 A.M. – 10:00 A.M.

## Plenary 6: Nuclear Fuel Cycle Options Perceptions and Realities

Session Chairs: Andrew Kadak (*Exponent*), Frank Carré (*CEA-France*)

### San Diego Room

SPEAKERS:

- Frank Carré (*CEA-France*)
- Paul Murray (*AREVA*)
- Albert Machiels (*EPRI*)
- Charles Forsberg (*MIT*)
- Harukuni Tanaka (*JNFL-Japan*)

THURSDAY, JUNE 17, 2010 • 10:00 A.M. – 12:00 P.M.

## Pressurized Water Reactors

Session Chair: Shigemitsu Otsuka (*MHI*)

### Pacific Salon 1

10:00 a.m.

The Development of a Passive Auxiliary Feedwater System in APR+, Mun Soo Kim, Jong Cheon, Sang Hee Kang (*KHNP*)

10:20 a.m.

Reactor Coolant Pump Type RUV for Westinghouse Reactor AP 1000TM, Sven Baumgarten, Bernhard Brecht, Uwe Bruhns (*KSB AG*), Pete Fehring (*Westinghouse*)

# Embedded Topical Meeting: ICAPP'10 (Thursday)

## 10:40 a.m.

Experimental Study on Novovoronezh NPP-2 Steam Generator Model Condensation Power in the Event of the Beyond Design Basis Accident, O.V. Remizov, A.V. Morozov, A.A. Tsyganok, D.S. Kalyakin (*Institute for Physics and Power Engineering*), V.M. Berkovich, V.G. Peresadko, G.S. Taranov (*JSC*)

## 11:00 a.m.

A Dual Pressurized Water Reactor Producing 2000 MWe, Kyoung M. Kang (*Seoul National Univ*), Kune Y. Suh (*Seoul National Univ, PHILOSOPHIA*)

## 11:20 a.m.

A Robust Design Exercise to Establish a Soft Seated Steam Generator Relief Valve Main Seal for a PWR Application, J.L. Sulley, P. Thompson (*Rolls Royce*), E. Nowicki (*Weir Valves*)

## 11:40 a.m.

A Marine Propulsion Plant based on the 'Mutsu' PWR for an 8000-ton, Electrically-Propelled Ship, James Vaughan (*Royal Navy School of Marine Engineering*), Samuel Treasure (*Rolls-Royce plc*), Christopher Quick (*Ministry of Defence*), Ronan Leblon, Morgan Faucouit (*Ecole des Applications Militaires de l'Energie Atomique*), Kirk D. Atkinson, Jonathan C. Barrett, Alice Darbyshire, Simon Jewer, Paul M. Jenneson, Matthew K. Knott, Philip A. Beeley (*Defence Academy - College of Management and Technology*)

## Sodium-Cooled Fast Reactors-V

*Session Chair: Christian Latge (CEA)*

### Pacific Salon 3

#### 10:00 a.m.

Verification of the Plant Dynamics Analytical Code CERES: Comparison with the EBR-II Test, Yoshihisa Nishi, Nobuyuki Ueda, Satoshi Nishimura (*CRIEPI*), T.H. Fanning, F.E. Dunn (*ANL*)

#### 10:20 a.m.

Safety Improvement Research to Design a Sodium Fast Reactor Steam Generator with Regard to Sodium/Water Reaction Risk, A. Gerber, J.P. Pirus, S. Beils, B. Carlucci (*AREVA NP*), F. Beauchamp, J.Ph. Jeannot (*CEA DEN Cadarache*), G. Prèle (*EdF SEPTEN*)

#### 10:40 a.m.

Comparative Study on Advanced Fuel Handling Systems for JSFR, Yoshitaka Chikazawa (*JAEA*), Masayuki Uzawa (*MFBR*), Shinichi Usui (*KPS*), Katsuhiko Tozawa (*FESYS*), Shoji Kotake (*JAPC*)

#### 11:00 a.m.

Development of the JSFR Fuel Handling System and Mock-up Experiments of Fuel Handling Machine in Abnormal Conditions, Atsushi Katoh, Shingo Hirata, Yoshitaka Chikazawa, Nariaki Uto (*JAEA*), Hiroyuki Obata, Shoji Kotake (*JAPC*), Masayuki Uzawa (*Mitsubishi FBR Systems*)

#### 11:20 a.m.

Evaluation of Neutronic Physics Parameters and Reactivity Coefficients for Sodium Fast Reactors, A. Ponomarev, C.H.M. Broeders, R. Dagan, M. Becker (*KIT*)

## Operational Experience

*Session Chair: Shih-Ping Kao (AREVA NP)*

### Pacific Salon 7

#### 10:00 a.m.

Verification of Revised EOP Using the CATHENA Code for Wolsong NPP-CANDU 6, Won-Sun Kim, Seok-Dong Lee, Kyu-Soo Jang (*KHNP*), Jong-Hyun Kim, Seong-Soo Choi, Kun-Ho Chun, Hee-Soo Bae (*Atomic Creative Technology Co*)

#### 10:20 a.m.

BWR Recirculation Pump Adjustable Speed Drive Salient Controls Functionality, James W. Morgan (*ILD, Inc. /Exelon Nuclear*), Thomas Sudduth, Leon Norman (*AREVA NP*)

#### 10:40 a.m.

Establishing Construction – Corrective Action Program for New Nuclear Power Plants under Construction in KHNP, Young-II Lee, Yang-Hee Lee, Hong-Jung Choi (*KHNP*)

#### 11:00 a.m.

The Solution of 'Leakage in Spent Fuel Reception Bay', H.C. Park, J.T. Kim, J.H. Lee (*KHNP*)

#### 11:20 a.m.

Bridging Probabilistic Safety Assessment Studies with Information Management System, Eric Michael Luanco (*Ventyx*)

## Severe Accidents-III: Plant Studies

*Session Chair: Luis Herranz (CIEMAT)*

### Pacific Salon 2

#### 10:00 a.m.

Analysis of a High Pressure Sequence for an Integral-Type Reactor Using SCDAP/RELAP5, Rae-Joon Park, Kyoo-Whan Bae, Sang-Baik Kim, Youngho Jin (*KAERI*)

#### 10:20 a.m.

Hydrogen Behaviour following a Station Blackout at Wolsong Units 1-4, Han-Chul Kim, Jae-Hong Park (*KINS*), Song-Won Cho (*KRTI*)

#### 10:40 a.m.

Detailed Evaluation on Entry Condition of the Severe Accident Management Guidance for OPR1000 Using SCDAP/RELAP5, Rae-Joon Park, Seong-Wan Hong (*KAERI*)

#### 11:00 a.m.

The Impact of Early Spray Activation During a Postulated Severe Accident in the AREVA EPR™ Containment, Harald Dimmelmeier, Jürgen Eyink (*AREVA NP GmbH*), Robert P Martin (*AREVA NP*)

#### 11:20 a.m.

Evaluation of Decision Making in Technical Support Center for Effective Severe Accident Management, Changwook Huh, Namduk Suh (*KINS*)

# Embedded Topical Meeting: ICAPP'10 (Thursday)

## 11:40 a.m.

Severe Accident Analysis to Prevent High Pressure Scenarios in EPR™, G. Azarian, P. Gandrille, M. Gasperini, R. Klein (*AREVA NP SAS*)

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## Advanced Reactor Testing and Analysis-I

Session Chair: Richard Vilim (*ANL*)

### Pacific Salon 4

#### 10:00 a.m.

Study of Steam Control Valve for Large Turbine System, Koo S. Kim (*Philosophia*), Kune Y. Suh (*Philosophia, Seoul National Univ*)

#### 10:20 a.m.

Safety Analysis of a Compact Vessel Integrated LWR, Koroush Shirvan, Pavel Hejzlar, Mujid S. Kazimi (*MIT*)

#### 10:40 a.m.

A One-Dimensional Compressor Model for Super-Critical Carbon Dioxide Applications, Richard B. Vilim (*ANL*)

#### 11:00 a.m.

Stability Analysis of Fluid at Supercritical Pressure in a Heated Channel, Tara Gallaway, Michael Z. Podowski (*RPI*)

#### 11:20 a.m.

Study on a Nuclear Spaceship for Interplanetary Cruise: Optimization of Radiator-Panels, Daiki Takeyama, Taku Kitamura, Atsurou Yoshida, Tadashi Narabayashi, Yoichiro Shimazu, Masashi Tsuji (*Hokkaido Univ*)

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## Thermal Hydraulics Measurement and Modeling Fundamentals

Session Chairs: Karen Vierow (*Texas A&M Univ*), Sama Bilbao y Leon (*IAEA*)

### Pacific Salon 5

#### 10:00 a.m.

Thermal-hydraulic Characteristics Evaluations of the Printed Circuit Heat Exchanger in a Helium- Water Test Loop, In Hun Kim, Hee Cheon No (*KAIST*)

#### 10:20 a.m.

Experimental Study of Water Subcooling Effect on Steam-Water Flooding in a Large-diameter Vertical Tube, O. Draznin (*Texas A&M Univ*), S. N. Ritchey (*Purdue Univ*), K. Vierow (*Texas A&M Univ*)

#### 10:40 a.m.

Interaction of Stratified Light Gas Layer with a Buoyant Jet in Containment: Hydrogen/Helium Material Scaling, Sanjeev Gupta, Teja Kanzleiter, Karsten Fischer, Gunter Langer, Gerhard Poss (*Becker Technologies GmbH*)

#### 11:00 a.m.

Single-phase Cross-mixing Measurements with a Wire-mesh Sensor in a 4x4 Rod Bundle, Arto Ylönen (*PSI*), Horst-Michael Prasser (*PSI, Swiss Federal Institute of Technology*)

## 11:20 a.m.

Experimental Studies on Air-Water Two-Phase Flow through a 90-Degree Vertical Elbow, Mohan S. Yadav, Seungjin Kim (*The Pennsylvania State Univ*)

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## Nuclear Waste Management

Session Chair: Charles Forsberg (*MIT*)

### San Diego Room

#### 10:00 a.m.

Improvement of Induced Activity Estimation Method, Tomohiro Ogata, Seiichi Kudo, Takashi Muramatsu, Yuya Watanabe (*Mitsubishi Heavy Industries*), Satoshi Iwai, Shunji Takagi (*Mitsubishi Research Institute*), Hideki Harano, Tetsuo Matsumoto, Jun Nishiyama (*National Institute of Advanced Industrial Science and Technology*)

#### 10:20 a.m.

Collection and Transportation of Specimens from the Irradiated Pressure Tubes at Wolsong Unit#1, Dong-Hyeun Hwang, Jung-Kwon Son (*NETEC/KHNP*)

#### 10:40 a.m.

An Overview on the National Strategy to Implement a Deep Geological Repository in Romania, Gheorghe Negut, Petre Ghitescu, Daniel Dupleac, Ilie Prisecaru (*Univ Politehnica Bucharest*)

#### 11:00 a.m.

Thermal Model for the Study of High Level Waste Geological Disposal, H. Leroyer, A. Soulié, P. Rascle, C. Garzenne, C. Péniguel, I. Rupp (*EDF*)

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## Materials Irradiation and Facilities

Session Chair: Joe Palmer (*INL*)

### Pacific Salon 6

#### 10:00 a.m.

Hydraulic Shuttle Irradiation System (HSIS) Recently Installed in the Advanced Test Reactor (ATR), A. Joseph Palmer, G.L. McCormick, S.J. Corrigan (*INL*)

#### 10:20 a.m.

Fabrication and Characterization of a Conduction Cooled Thermal Neutron Filter, Heather Wampler, Adam Gerth, Heng Ban (*Utah State Univ*), Donna Post Guillen, Douglas Porter, Cynthia Papesch (*INL*), Thomas Hartmann (*Univ of Nevada at Las Vegas*)

#### 10:40 a.m.

Post-Irradiation Evaluation of the Stirling Alternator Radiation Test Article, Omar R. Mireles (*Univ of Florida*), E. Eugene Shin (*Ohio Aerospace Institute*), Cheryl Bowman (*NASA Glenn Research Center*)

#### 11:00 a.m.

Test Train Assembly Facility (TTAF) Capabilities at the Advanced Test Reactor (ATR) Complex, Clifford J. Stanley (*INL*)

# Embedded Topical Meeting: ICAPP'10 (Thursday)

THURSDAY, JUNE 17, 2010 • 1:00 P.M. – 3:00 P.M.

## Sodium-Cooled Fast Reactors-VI

Session Chairs: Pavel Hejzlar (*TerraPower*), Tyler Ellis (*TerraPower*)

### Pacific Salon 3

1:00 p.m.

A Prospective Study of Power Cycles Based on the Expected Sodium Fast Reactor Parameters, L.E. Herranz (*CIEMAT*), J.I. Linares, B.Y. Moratilla, G.D. Pérez (*Comillas Pontifical Univ*)

1:20 p.m.

Applying the Technology Neutral Framework to Evaluate Core Outlet Temperature Changes in a Sodium Fast Reactor, M.R. Denman, N.E. Todreas, M.J. Driscoll (*MIT*)

1:40 p.m.

Safety Objectives of SEPIA Systems for Sodium-Cooled Fast Reactor, S. Beils, B. Carlucci, J. Champigny (*AREVA NP*), M.S. Chenaud, D. Lorenzo (*CEA DEN*), S. Massara (*EDF R&D*), B. Mathieu, G. Prèle, M. Schikorr (*CEA DEN*)

2:00 p.m.

Toward More Realistic Source Terms for Metallic-Fueled Sodium Fast Reactors, R. Denning, A. Brunett, D. Grabaskas, M. Umbel, T. Aldemir (*Ohio State Univ*)

2:20 p.m.

Sacrificial Materials for SFR Severe Accident Mitigation, Christophe Journeau, Kamila Plevacova, Gérald Rimpault, Sandra Pomerouly (*CEA*)

## Generic/Longer Term Concepts

Session Chair: Jiri Krepel (*PSI*)

### Pacific Salon 1

1:00 p.m.

The 15-year ISTC Experience in Realization of International Collaboration for Nuclear Science and Engineering (Review), L.V. Tocheny, W. Gudowski (*ISTC*)

1:20 p.m.

Self-Sustained Regime of Nuclear Burning Wave in Safe Fast Reactor Using Mixed Th-U-Pu Fuel Cycle, A.S. Fomin, S.P. Fomin, Yu.P. Mel'nik, V.V. Pilipenko, N.E. Shul'ga (*NSC KIPT*)

1:40 p.m.

Overview of Component Testing Requirements for a Small Fluoride-Salt-Cooled High-Temperature Reactor, Sacit M. Cetiner, David E. Holcomb, George F. Flanagan, Fred J. Peretz, Graydon L. Yoder (*ORNL*)

2:00 p.m.

In-Pile Experiment of a New Hafnium Aluminide Composite Material to Enable Fast Neutron Testing in the Advanced Test Reactor, Donna Post Guillen, Douglas L. Porter, James R. Parry (*INL*), Heng Ban (*Utah State Univ*)

2:20 p.m.

Comparison of Closed Fuel Cycles for Generation-IV Fast Reactors by Means of the Equilibrium Procedure EQL3D, Jiri Krepel, Kaichao Sun, Sandro Pelloni, Stevan Pilarski, Konstantin Mikityuk (*PSI*)

## LOCA and Non-LOCA Safety Analysis\* (until 4pm)

Session Chair: Qiao Wu (*Oregon State Univ*)

### Pacific Salon 5

1:00 p.m.

Modeling of Atmosphere Stratification in Containments of Nuclear Power Plants Using Lumped-parameter Code, M. Povilaitis, E. Urbonavičius, S. Rimkevičius (*Lithuanian Energy Institute*)

1:20 p.m.

Conceptual Framework for Using "Bests Estimate Plus Uncertainty" as a Basis for Licensing Activities for Fuels Developed for a Advanced Reactor, Patrick R. McClure, Cetin Unal (*LANL*), Brent Boyack (*LANL Contractor*)

1:40 p.m.

Best Estimate Analysis of Station Blackout Case in RBMK-type Reactors, A. Kaliatka, E. Uspuras, S. Rimkevičius (*Lithuanian Energy Institute*)

2:00 p.m.

Analysis of QUENCH-ACM Experiments Using SCDAP/RELAP5, J. Birchley (*PSI*), J. Stuckert (*Karlsruhe Institute of Technology*)

2:20 p.m.

Experimental Results of Reflood Bundle Test QUENCH-15 with ZIRLO™ Cladding Tubes, Juri Stuckert, M. Große, M. Steinbrück (*Karlsruhe Institute of Technology*)

2:40 p.m.

Transient Analysis of Anticipated Transient Without Scram (ATWS) Events for Lungmen by Modified PCTAN-ABWR Code, Kai-Lan Chang, Chunkuan Shih (*National Tsing Hua Univ*), Hui-Wen Huang (*INER*)

3:00 p.m.

Best-Estimated Multi-Dimensional Calculation during LBLOCA for APR1400, Deog Yeon Oh, Young Seok Bang, Ae Ju Cheong, Sweng Woong Woo (*KINS*)

3:20 p.m.

Study on 1-D Neutronic Model and Chexal-Layman Correlation and Their Effects by Using MAAP5 Code, Yu-Huai Shih, Te-Chuan Wang (*INER*)

## Advances in Regulatory Issues

Session Chair: Michael L. Scott (*US NRC*)

### Pacific Salon 2

1:00 p.m.

Effects of Generic Issues Program on Improving Safety, Mehdi Reisi Fard, John V. Kauffman (*US NRC*)

# Embedded Topical Meeting: ICAPP'10 (Thursday)

## 1:20 p.m.

Review of Reactor Internals Vibration Assessment Programs, Jai R. Rajan, Thomas G Scarbrough, Terri Spicher (*US NRC*)

## 1:40 p.m.

Loss of Final Heat Sink in a Nordic BWR: A Strategy for Accident Mitigation, Mikko Lemmetty (*TVO*)

## 2:00 p.m.

The Ongoing Challenge – Closing Emergency Core Cooling System Strainer Issues for Good, Michael L Scott, Michael R Snodderly (*US NRC*)

## 2:20 p.m.

Analyses and Estimation of Insulation Material Release in E.ON- PWR under Loss of Coolant Conditions, Reinhard Koring (*E.ON Kernkraft*)

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## Advanced Reactor Testing and Analysis-II

Session Chair: Theron Marshall (*GE Hitachi Nuclear Energy*)

### Pacific Salon 4

#### 1:00 p.m.

Validation of Designing Tools as Part of Nuclear Pump Development Process, Toni Klemm, Frank Sehr, Phillip Spenner, Jochen Fritz (*KSB Aktiengesellschaft*)

#### 1:20 p.m.

Low Temperature Cycles with Supercritical Fluids for Nuclear Plants, Petr Hajek (*Research Centre Rez*)

#### 1:40 p.m.

Development of High-efficiency Jet Pump for Boiling Water Reactors, Naoyuki Ishida, Hisamichi Inoue, Masaya Ohtsuka (*Hitachi*)

#### 2:00 p.m.

Analysis of Nonlinearities Compensation for Control Valves, B. Halimi (*Seoul National Univ*), Kune Y. Suh (*Seoul National Univ, PHILOSOPHIA*)

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## Materials Modeling and Testing

Session Chair: Jim Cole (*INL*)

### Pacific Salon 6

#### 1:00 p.m.

Long Term High-Temperature Oxidation of Alloys for Intermediate Heat Exchangers, Celine Cabet, Brigitte Duprey (*CEA*)

#### 1:20 p.m.

Tribological Testing of Catcher Bearing Materials of the Gas Turbine Modular Helium Reactor (GT-MHR) Turbomachine, C.B. Baxi, A. Telengator (*General Atomics*), M.N. Borovkov, E.G. Novinskiy, S.E. Belov (*Experimental Design Bureau of Machine Building*)

## 1:40 p.m.

Study on an Innovative Fast Reactor Utilizing Hydride Neutron Absorber - Fabrication and High Temperature Behavior of Hafnium Hydride Pellets, Mutsumi Hirai, Hiroshi Sakurai, Ryoichi Yuda, Atsushi Ouchi (*Nippon Nuclear Fuel Development Co. Ltd*), Kenji Konashi (*Tohoku Univ*)

## 2:00 p.m.

Study on an Innovative Fast Reactor Utilizing Hydride Neutron Absorber - Development of Sodium Bond Type Hafnium Hydride Control Rod, Masahiko Ariyoshi, Koki Okazaki (*Toshiba*), Kenji Konashi (*Tohoku Univ*)

## 2:20 p.m.

Study on an Innovative Fast Reactor Utilizing Hydride Neutron Absorber- Final Report of Phase I Study, Kenji Konashi, Tomohiko Iwasaki (*Tohoku Univ*), Kunihiro Itoh (*NDC*), Mutsumi Hirai (*NFD*), Ikken Sato (*JAEA*), Ken Kurosaki (*Osaka Univ*), Akihiro Suzuki (*Univ. Tokyo*), Yoshihito Matsumura (*Tokai Univ*), Shinji Abe (*Mitsubishi Nuclear Engineering Co*)

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## Nuclear Energy and Global Environment-II

Session Chair: Christian Latge (*CEA*)

### Pacific Salon 7

#### 1:00 p.m.

Implications of Gigawatt-Year Electric Storage Systems on Future Baseload Nuclear Electricity Demand, Isaiah Oloyede, Charles Forsberg (*MIT*)

#### 1:20 p.m.

Options for Nuclear-Geothermal Gigawatt-Year Peak Electricity Storage System, You Ho Lee, Charles Forsberg, Michael Driscoll, Benyamin Sapiie (*MIT*)

#### 1:40 p.m.

Nuclear Desalination for the Southwestern United States, Keith E. Holbert (*Arizona State Univ*), Mark Lewis (*Water Resource Institute*), Dexinghui Kong (*Arizona State Univ*)

#### 2:00 p.m.

Water Desalination Using Different Capacity Reactors Options, Gustavo Alonso (*ININ, IPN*), Samuel Vargas (*ININ*), Edmundo del Valle (*IPN*), Ramon Ramirez (*ININ*)

#### 2:20 p.m.

Development of Inventory Estimation Code for Tritium Storage and Delivery System, Sang Chul Lee, Kun Jai Lee (*KAIST*), Kyu Min Song, Soon Hwan Shon (*KEPRI*)

**ICAPP EXHIBIT 2010**

**Sunday, June 13**

6-8pm

(ANS President's Reception)

**Monday, June 14**

7am-2:30pm

(Continental Breakfast, ANS Attendee Luncheon)

**Tuesday, June 15**

10am-1:30pm

(Concession Lunch • Prizes)

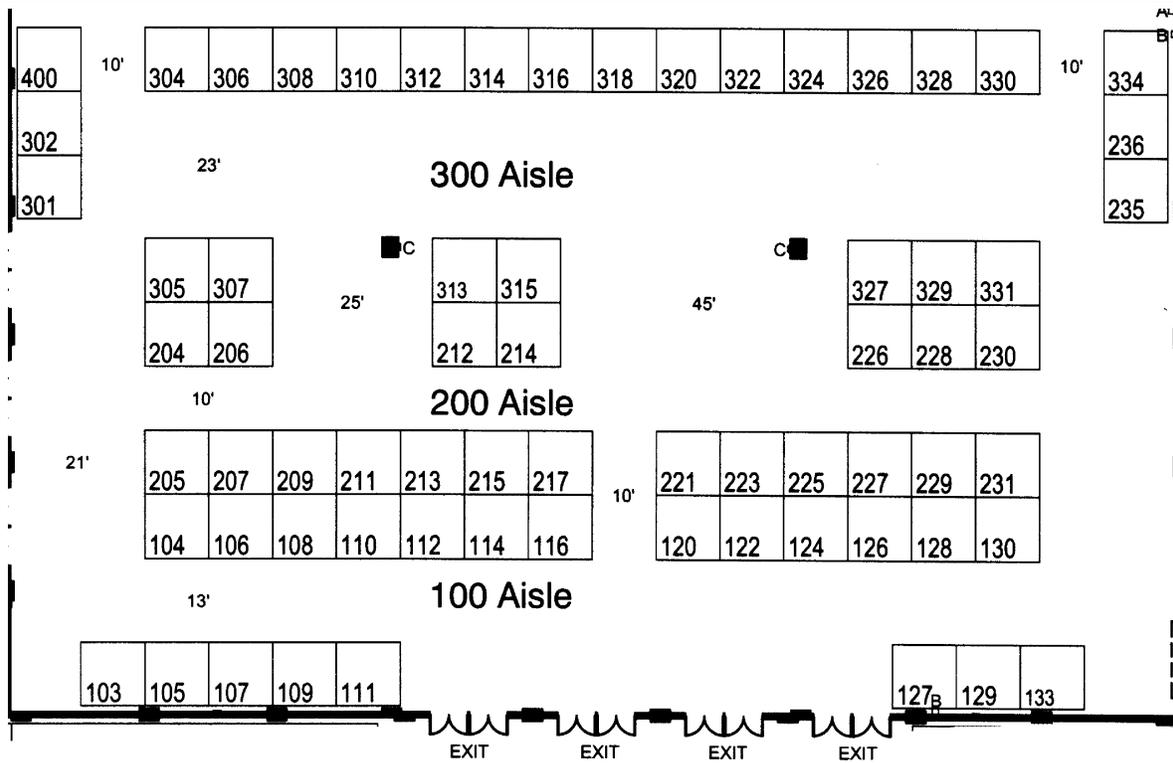


The ICAPP EXHIBIT 2010 will be held June 13-15, 2010 in the Grand Exhibit Hall of the Town & Country Resort in San Diego, CA. The Exhibit will be open Sunday-Tuesday with many special events taking place in the Hall. A list of exhibitors follows:

<b>ABS Consulting</b>	<b>206</b>
<b>Advanced Reactor Concepts</b>	<b>318</b>
<b>AREVA</b>	<b>213</b>

<b>Artisan Industries, Inc.</b>	<b>207</b>
<b>AT&amp; F Nuclear, Inc.</b>	<b>211</b>
<b>Atomexpo, LLC/Rosatom</b>	<b>226, 228, 230</b>
<b>Bechtel Power Corporation</b>	<b>204</b>
<b>Black &amp; Veatch</b>	<b>209</b>
<b>Commissioning Agents, Inc.</b>	<b>330</b>
<b>Del Mar Avionics</b>	<b>236</b>
<b>EXCEL Services Corporation</b>	<b>212, 214, 313, 315</b>
<b>General Atomics</b>	<b>215</b>
<b>Heatric</b>	<b>301</b>
<b>IAEA Careers/Argonne National Laboratory</b>	<b>307</b>
<b>Idaho National laboratory</b>	<b>221, 223</b>
<b>ITD USA</b>	<b>229, 231</b>
<b>Kamatics Corporation</b>	<b>235</b>
<b>KHNP</b>	<b>227</b>
<b>KSB, Inc.</b>	<b>310, 312, 314</b>
<b>Lockheed Martin</b>	<b>331</b>
<b>Mitsubishi Heavy Industries, Ltd./ Mitsubishi Nuclear Energy Systems, Inc.</b>	<b>326, 328</b>
<b>NETZSCH Instruments</b>	<b>205</b>
<b>Northrop Grumman</b>	<b>116</b>
<b>Nuclear Energy University Programs</b>	<b>225</b>
<b>Nuclear Plant Journal</b>	<b>217</b>
<b>Nuclear Safety Associates</b>	<b>305</b>
<b>NuScale Power</b>	<b>316</b>
<b>Toshiba Corporation</b>	<b>302, 400</b>
<b>TW Metals, Inc.</b>	<b>104, 106</b>
<b>University of Maryland A. James Clark School of Engineering</b>	<b>327</b>
<b>U.S. Navy</b>	<b>322, 324</b>
<b>Westinghouse Electric Company</b>	<b>304, 306, 308</b>

## FLOOR PLAN: TOWN & COUNTRY RESORT – GRAND EXHIBIT HALL – SAN DIEGO, CA



# ANS EXPO 2010

November 7-9, 2010 • Riviera Hotel • Las Vegas, NV

### Embedded Topicals:

- Technology of Fusion Energy (TOFE)
- Nuclear Plant Instrumentation, Control and Human Machine Interface Technologies (NPIC&HMIT 2010)
- Isotopes of Medicine and Industry

### Exhibitors Receive:

One Complimentary Full Meeting Badge, One Complimentary Exhibitor Only Badge, Tickets for the ANS President's Reception & ANS Attendee Luncheon, ANS Expo Guide Listing, Program Publicity, and a copy of the Meeting TRANSACTIONS.

- Sunday – 6-8pm (ANS President's Reception)
- Monday – 11am-6pm (ANS Attendee Luncheon and ANS Expo Fest)
- Tuesday – 10am-2pm (Events TBD)

**Contact:** Sharon Bohlander on 800.250.3678 x227 or visit [www.earlbeckwith.com](http://www.earlbeckwith.com).

# Professional Development Workshop

## “Preparing for the Nuclear Engineering Professional Engineering Exam”

**Sunday, June 13, 2010**

**8:30 a.m. - 5:00 p.m.**

**Location: Pacific Salon Four**

### WORKSHOP ORGANIZER:

**Dr. Robert D. Busch, P.E.**, Director, Nuclear Engineering Laboratory, University of New Mexico

### WORKSHOP PRESENTERS:

**Dr. Robert D. Busch, P.E.**, Director, Nuclear Engineering Laboratory, University of New Mexico

**Kermit A. Bunde, P.E.**, DOE

**Gerald Loignon, Jr., P.E.**, SCANA

### PURPOSE OF WORKSHOP:

This course is designed for individuals who have passed the Fundamentals of Engineering Exam (formerly the EIT exam) and who are preparing for the Professional Engineering Exam (PE exam) in Nuclear Engineering. Instructors will provide details on registration and how it differs from state to state, plus an overview of the examination formats. The six basic skill areas; neutronics, instrumentation and measurements, nuclear power shielding, nuclear materials and fuels, and radioactive waste, will be discussed in detail. For each skill area, the instructor will describe the topics and the skills to be tested within each.

Examples of questions will be presented in depth, after which students will work other typical questions on their own. Instructors will provide assistance, then review solutions with the group. Students will be provided a sample exam and list of recommended resources for continued study.

### WORKSHOP OUTLINE:

<b>TIME</b>	<b>TOPIC</b>	<b>PRESENTER</b>
8:30 AM – 9:00 AM	Introduction	
9:00 AM – 9:30 AM	Radioactive Waste	Dr. Robert D. Busch
9:30 AM – 10:30 AM	Neutronics	Kermit A. Bunde
10:30 AM – 11:30 AM	Nuclear Fuels	Gerald Loignon
11:30 AM – 1:00 PM	Lunch (on your own)	
1:00 PM – 2:00 PM	Radiation Protection/Shielding	Dr. Robert D. Busch
2:00 PM – 3:30 PM	Nuclear Power/PRA	Gerald Loignon
3:30 PM – 4:30 PM	Instrumentation	Dr. Robert D. Busch
4:30 PM – 5:00 PM	Wrapup	

# Professional Development Workshop

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## “Source Term Quantification for Nonreactor Nuclear Installation Safety Analysis”

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Sunday, June 13, 2010

8:30 a.m. - 5:00 p.m.

Location: Pacific Salon Five

TIME	MATERIAL PRESENTED
8:30 AM	Introduction <ul style="list-style-type: none"><li>• Housekeeping Items</li><li>• Resume: Jofu Mishima</li><li>• Course Purpose &amp; Objectives</li></ul>
8:45 AM	Background Material <ul style="list-style-type: none"><li>• Scope</li><li>• Five Factor Formula</li><li>• Particle Generation</li><li>• Aerosol Physics</li><li>• Experimental Basis – History</li><li>• Release Mechanisms</li></ul>
9:15 AM	Explosive Releases <ul style="list-style-type: none"><li>• Detonation</li><li>• Deflagration</li></ul>
10:00 AM	Break
10:15 AM	Explosive Releases (continued) <ul style="list-style-type: none"><li>• Over-Pressurization</li></ul>
10:45 AM	Thermally-Induced Release <ul style="list-style-type: none"><li>• Volatile compounds</li><li>• Non-volatile compounds</li><li>• Flammable liquids</li><li>• Reactive metals</li></ul>
12:00 PM	Lunch
1:00 PM	Thermally-Induced Releases (continued)
3:00 PM	Break
3:15 PM	Mechanically Induced Releases <ul style="list-style-type: none"><li>• Spill</li><li>• Shock vibration</li><li>• Crush impact</li></ul>
4:00 PM	Aerodynamic Entrainment <ul style="list-style-type: none"><li>• Liquid</li><li>• Powder</li></ul>
4:30 PM	Questions & Discussion
5:00 PM	Adjournment and Workshop Feedback

# DOE NCSP Hazard Evaluation Techniques Workshop

## “Hazard Evaluation Techniques”

**Friday, June 18, 2010**

**8:00 a.m. - 5:00 p.m.**

**Location: Windsor Room**

***Sponsored by NNSA***

### TARGET AUDIENCE:

Criticality Safety professionals and Nuclear Facility Safety professionals.

The Hazard Evaluation Techniques workshop is designed to acquaint criticality safety professionals with formal hazard analysis methods for safety analysis.

Upon completion of this workshop, participants will understand various techniques used to perform a comprehensive assessment of facility hazards that provide a qualitative risk perspective to help in decision making for risk reduction. The five techniques covered in detail include: What If/Checklist Analysis, Hazards and Operability (HAZOP) Analysis, Event Tree, Fault Tree, and Human Reliability Analysis.

### INSTRUCTORS:

Julie Johnston, and Ron Selvage

*Los Alamos National Laboratory, Safety Basis Technical Services Group*

### AGENDA:

<u>TIME</u>	<u>TOPIC</u>
8:00 A.M. – 9:45 A.M.	Purpose and applicability of a hazard evaluation Pre-start hazard evaluation activities Application of frequency, consequence, and risk bins to accident scenarios
10:00 A.M. – 10:45 A.M.	What-If/Checklist Technique
11:00 A.M. – 12:00 P.M.	Hazard and Operability (HAZOP) Analysis Technique
12:00 P.M. – 1:00 P.M.	Lunch
1:00 P.M. – 1:30 P.M.	Use of formality of operations for human reliability
1:45 P.M. – 2:30 P.M.	Event Tree and Fault Tree Techniques
2:30 P.M. – 3:00 P.M.	Selection of the appropriate technique for general hazard studies, design phase studies of process and process operations, or detailed analysis of a specific hazardous situation.

# Committee Meetings

## NATIONAL COMMITTEES

### Accreditation Policies and Procedures

Sunday, 11:00 A.M. – 12:00 P.M.  
Location: Eaton

### ANS Business Meeting

Wednesday, 4:15 P.M. – 5:15 P.M.  
Location: Hampton

### Board of Directors

Saturday, 8:00 A.M. – 4:00 P.M.  
Location: Town & Country Ballroom

### Bylaws and Rules

Sunday, 4:30 P.M. – 6:00 P.M.  
Location: Royal Palm Salon Three

### Finance

Tuesday, 4:00 P.M. – 7:00 P.M.  
Location: Fairfield

### Honors and Awards

Tuesday, 5:00 P.M. – 7:00 P.M.  
Location: Golden West Room

### International

Sunday, 11:30 A.M. – 2:30 P.M.  
Location: San Diego Room

### Local Sections/Workshop

Sunday, 8:00 A.M. -12:00 P.M.  
Location: California Room

### Membership

Sunday, 11:00 A.M. – 12:00 P.M.  
Location: Clarendon Room

### National Program Committee (NPC) Program

Wednesday, 4:00 P.M. – 7:00 P.M.  
Location: California Room

### Screening and International

Sunday, 10:00 A.M. – 12:00 P.M.  
Location: Golden West Room

### NEED

Sunday, 7:30 P.M. – 9:00 P.M.  
Location: Sunset

### Planning

Sunday, 2:00 P.M. – 6:00 P.M.  
Location: California Room

### Professional Development Workshop

Tuesday, 7:30 A.M. – 8:30 A.M.  
Location: Lexington

## Professional Divisions

### Committee Meeting

Tuesday, 4:00 P.M. – 6:30 P.M.  
Location: California Room

### Training Workshop

Saturday, 5:00 P.M. – 8:00 P.M.  
Location: Royal Palm Salon Four & Five

### Professional Engineering Exam Committee Meeting

Sunday, 3:00 P.M. – 5:00 P.M.  
Location: Ascot

### Item Writers Workshop

Saturday, 6:00 P.M. – 10:00 P.M.  
Location: Royal Palm Salon Six

### PAKS Workshop

Saturday, 8:00 A.M. – 5:00 P.M.  
Location: Royal Palm Salon Six

### Professional Women in ANS

Monday, 11:30 A.M. – 1:00 P.M.  
Location: Dover

### Public Information

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: San Diego Room

### Public Policy

Wednesday, 11:30 A.M. – 1:30 P.M.  
Location: Dover

### Publications Steering

**Book Publishing**  
Sunday, 11:00 A.M. – 12:00 P.M.  
Location: Stratford

### Meetings, Proceedings and Transactions

Sunday, 9:30 A.M. – 10:30 A.M.  
Location: Stratford

### Nuclear News Editorial Advisory

Sunday, 4:00 P.M. – 5:30 P.M.  
Location: Clarendon

### Publications Steering

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: Stratford

### Technical Journals

Sunday, 1:00 P.M. – 3:00 P.M.  
Location: Stratford

### Scholarship Policy and Coordination

Monday, 12:00 P.M. – 1:00 P.M.  
Location: Crescent

### Student Sections

**Executive**  
Monday, 6:00 P.M. – 7:00 P.M.  
Location: Windsor

### Reports

Monday, 7:00 P.M. – 8:00 P.M.  
Location: Windsor

## SPECIAL COMMITTEES

### Integration Oversight

Tuesday, 9:00 A.M. – 11:00 A.M.  
Location: California Room

### Nuclear Nonproliferation

Sunday, 2:00 P.M. – 4:00 P.M.  
Location: Royal Palm Salon Three

### Small and Medium-sized Reactor Generic Licensing Issues

Sunday, 12:00 P.M. – 2:30 P.M.  
Location: Royal Palm Salon Four

### Used Fuel Management Options

Sunday, 2:30 P.M. – 4:00 P.M.  
Location: Galleria One Room

### Monday, 6:00 P.M. – 8:00 P.M.

Location: Galleria One Room

## OTHER COMMITTEES

### 17th PBNC Organizing Committee

Tuesday, 4:00 P.M. – 5:00 P.M.  
Location: Crescent

### CNF

Monday, 7:30 P.M. – 10:00 P.M.  
Location: Dover

### Eagle Alliance Board of Directors

Sunday, 1:00 P.M. – 3:30 P.M.  
Location: Lexington

### 2011 ICAPP Planning Committee

Tuesday, 2:30 P.M. – 3:30 P.M.  
Location: Stratford

### INSC

Sunday, 3:00 P.M. – 5:00 P.M.  
Location: Golden West Room

### Mathematics and Computation/ Reactor Physics/ Radiation Protection & Shielding

**Joint Benchmark Meeting**  
Sunday, 11:00 A.M. – 1:00 P.M.  
Location: Brittany

### NEDHO

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: Royal Palm Salon Four

### PAK Workshop

Saturday, 8:00 A.M. – 5:00 P.M.  
Location: Royal Palm Salon Six

### Past Presidents' Meeting

Tuesday, 7:00 AM – 9:00 AM  
Location: Crescent

### UWC 2010 Planning Committee

Sunday, 12:00 P.M. – 1:00 P.M.  
Location: Lexington

## DIVISION COMMITTEES

### Accelerator Applications

**Executive**  
Monday, 11:30 A.M. – 1:00 P.M.  
Location: Stratford

### Aerospace Nuclear Science and Technologies

Sunday, 12:00 P.M. – 2:00 P.M.  
Location: Galleria One

### Biology and Medicine

**Committee of the Whole**  
Sunday, 4:00 P.M. – 5:30 P.M.  
Location: Brittany

### Computational Medical Physics Working Group

Sunday, 10:00 A.M. – 11:00 A.M.  
Location: Brittany

### Joint Program Committee – I&R and B&M

Sunday, 1:30 P.M. – 2:30 P.M.  
Location: Sunset

### Education, Training, and Workforce Development

**Alpha Nu Sigma**  
Sunday, 1:00 P.M. – 2:00 P.M.  
Location: Royal Palm Salon Three

### Executive/Membership/ Honors and Awards

Sunday, 1:30 P.M. – 4:00 P.M.  
Location: Towne

### Nuclear Workforce Working Group

Sunday, 12:00 P.M. – 1:30 P.M.  
Location: Ascot

### Program

Sunday, 10:30 A.M. – 12:00 P.M.  
Location: Ascot

### University/Industry/ Government Relations

Sunday, 9:30 A.M. – 10:30 A.M.  
Location: Ascot

### Environmental Sciences

### ESD Special Committee on Climate Change

Sunday, 1:00 P.M. – 3:00 P.M.  
Location: Fairfield

### Executive

Sunday, 10:00 A.M. – 12:00 P.M.  
Location: Fairfield

### Nuclear Production of Hydrogen Working Group

Sunday, 12:00 P.M. – 1:00 P.M.  
Location: Fairfield

### Program

Sunday, 8:30 A.M. – 10:00 A.M.  
Location: Fairfield

## Fuel Cycle and Waste Management

### Executive

Sunday, 1:00 P.M. – 2:30 P.M.  
Location: Royal Palm Salon One

### Program

Sunday, 12:00 P.M. – 1:00 P.M.  
Location: Royal Palm Salon One

### Technical Operating and Standards Committee

Sunday, 2:30 P.M. – 3:30 P.M.  
Location: Royal Palm Salon One

## Fusion Energy

### Executive

Sunday, 3:00 P.M. – 5:00 P.M.  
Location: Fairfield

## Human Factors, Instrumentation, and Controls

### Executive/Program

Sunday, 12:00 P.M. – 2:30 P.M.  
Location: Eaton

## Isotopes and Radiation

### Executive

Sunday, 2:30 P.M. – 4:00 P.M.  
Location: Clarendon

### Joint Program Committee – I&R and B&M

Sunday, 1:30 P.M. – 2:30 P.M.  
Location: Sunset

## Materials Science and Technology

### Executive

Monday, 7:00 P.M. – 9:00 P.M.  
Location: Stratford

## Mathematics and Computation

### Computational Medical Physics Working Group

Sunday, 10:00 A.M. – 11:00 A.M.  
Location: Brittany

### Executive

Sunday, 2:00 P.M. – 4:00 P.M.  
Location: Brittany

### Program

Sunday, 1:00 P.M. – 2:00 P.M.  
Location: Brittany

## Nuclear Criticality Safety

### Education Meeting

Sunday, 1:00 P.M. – 2:00 P.M.  
Location: Royal Palm Salon Five

### Executive

Sunday, 3:00 P.M. – 4:30 P.M.  
Location: Royal Palm Salon Five

### Program

Sunday, 2:00 P.M. – 3:00 P.M.  
Location: Royal Palm Salon Five

## Nuclear Installation Safety

### Executive

Sunday, 7:30 P.M. – 9:00 P.M.  
Location: Royal Palm Salon Six

### Program

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: Royal Palm Salon Six

## Operations and Power

### Executive

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: Royal Palm Salon Two

### Nuclear Construction Working Group

Sunday, 12:30 P.M. – 2:30 P.M.  
Location: Royal Palm Salon Two

### Program

Sunday, 2:30 P.M. – 4:00 P.M.  
Location: Royal Palm Salon Two

## Radiation Protection and Shielding

### Executive

Sunday, 1:30 P.M. – 2:30 P.M.  
Location: Royal Palm Salon Six

### Program

Sunday, 12:30 P.M. – 1:30 P.M.  
Location: Royal Palm Salon Six

### Shielding Standards

Sunday, 12:00 P.M. – 12:30 P.M.  
Location: Royal Palm Salon Six

## Reactor Physics

### Executive

Sunday, 4:00 P.M. – 6:00 P.M.  
Location: Crescent

### Goals and Planning

Sunday, 1:00 P.M. – 2:00 P.M.  
Location: Crescent

### Honors and Awards

Sunday, 10:00 A.M. – 11:00 A.M.  
Location: Crescent

### Program

Sunday, 2:00 P.M. – 4:00 P.M.  
Location: Crescent

## Robotics and Remote Systems

### Executive

Sunday, 12:00 P.M. – 4:00 P.M.  
Location: Dover

## Thermal Hydraulics

### Executive

Sunday, 4:30 P.M. – 6:00 P.M.  
Location: Eaton

### Program

Sunday, 2:30 P.M. – 4:30 P.M.  
Location: Eaton

## Young Member Group

### Executive Committee

Monday, 11:30 A.M. – 1:00 P.M.  
Location: Towne

## STANDARDS COMMITTEES

### ANS Standards Board

Tuesday, 9:00 A.M. – 5:00 P.M.  
Location: Dover

### ANS-8.1

Sunday, 8:00 A.M. – 12:00 P.M.  
Location: Pacific Salon Seven

Tuesday, 7:00 A.M. – 8:30 A.M.  
Location: Fairfield

### ANS-8.12

Tuesday, 4:30 P.M. – 6:30 P.M.  
Location: Ascot

### ANS-8.20

Sunday, 9:00 A.M. – 12:00 P.M.  
Location: Lexington

### ANS-8.21

Thursday, 7:00 A.M. – 8:30 A.M.  
Location: Dover

### ANS-8.26

Wednesday, 7:00 A.M. – 8:30 A.M.  
Location: Stratford

### ANS-8.3

Tuesday, 7:00 A.M. – 8:30 A.M.  
Location: Galleria Two

### ANS-8.3

Wednesday, 7:00 A.M. – 8:30 A.M.  
Location: Dover

### ANS-10.7

Saturday, 8:30 A.M. – 4:30 P.M.  
Location: Pacific Salon Seven

### ANS-19

Sunday, 9:30 A.M. – 11:00 A.M.  
Location: Royal Palm Four

### ANS-19.1

Tuesday, 4:00 P.M. – 5:00 P.M.  
Location: Lexington

### ANS-19.3

Sunday, 9:00 A.M. – 10:00 A.M.  
Location: Clarendon

### ANS-53.1

Wednesday, 8:00 A.M. – 5:00 P.M.  
Location: Lexington

### ANS-54.1

Monday, 7:30 P.M. – 9:30 P.M.  
Location: Lexington

### ANS-58.8

Tuesday, 9:00 A.M. – 4:00 P.M.  
Location: Lexington

### ANS-58.16

Tuesday, 8:30 A.M. – 4:00 P.M.  
Location: Ascot

Wednesday, 8:30 A.M. – 4:00 P.M.  
Location: Ascot

Thursday, 8:30 A.M. – 4:00 P.M.  
Location: Ascot

### ANS-58.25

Tuesday, 8:00 A.M. – 5:00 P.M.  
Location: Galleria One Room

Wednesday, 8:00 A.M. – 5:00 P.M.  
Location: Clarendon

## NFSC

Monday, 8:30 A.M. – 5:00 P.M.  
Location: General Atomics  
3550 General Atomics Court  
San Diego, CA

## RISC

Wednesday, 8:00 A.M. – 4:00 P.M.  
Location: Golden West Room