

ANS 2006 WINTER MEETING & NUCLEAR TECHNOLOGY EXPO

“Ensuring the Future in Times of Change: Nonproliferation and Security”

November 12-16, 2006 • Albuquerque, NM

Albuquerque Convention Center, Hyatt Regency Albuquerque and Doubletree Albuquerque

EMBEDDED TOPICAL MEETINGS:

17th Topical Meeting on the Technology of Fusion Energy (TOFE)

5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology (NPIC&HMIT 2006)

PROFESSIONAL DEVELOPMENT WORKSHOP:

Digital Instrumentation Upgrades



Rio Grande Valley

Official Program



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

2006 ANS Winter Meeting & Nuclear Technology Expo;

**Embedded Topical Meeting: TOFE 2006; and
Embedded Topical Meeting: NPIC&HMIT 2006**

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We **thank** the **following companies** for their **generous support** of the

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Table of Contents

4	Meeting Highlights
5	Meeting Officials
6-7	About the Meeting Find important information regarding hotel accommodations, spouse/guest hospitality, student program, new attendee information, meeting registration, professional development workshops and more!
7-8	Special Events
9-10	Sessions by Track
10-11	Sessions by Division
12-13	Condensed Schedule – 2006 ANS Winter Meeting
14-31	Sessions by Day
32-39	TOFE – Sessions by Day 17th Topical Meeting on the Technology of Fusion Energy (TOFE)
40	NPIC & HMIT – Sessions by Track 5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology (NPIC&HMIT 2006)
41-49	NPIC & HMIT – Sessions by Day
50	ANS Student Professional Development Workshop
51	Professional Development Workshop: Digital Instrumentation Upgrades
52	DOE Nuclear Criticality Safety Program
53-55	Committee Meetings
56-57	ANS Nuclear Technology Expo

Updated: November 2, 2006

Meeting Highlights

SATURDAY, NOVEMBER 11, 2006

5:00 p.m. – 7:00 p.m.	Professional Divisions Workshop
6:00 p.m. – 8:00 p.m.	ANS Student Professional Development Workshop Mixer

SUNDAY, NOVEMBER 12, 2006

8:00 a.m. – 12:00 p.m.	ANS Student Professional Development Workshop
8:00 a.m. – 5:00 p.m.	Professional Development Workshop: Digital Instrumentation and Control
1:00 p.m. – 1:30 p.m.	First-Time Attendees Orientation
4:00 p.m. – 5:00 p.m.	Student Assistant Training Session
5:00 p.m. – 6:00 p.m.	Mentoring Program
6:00 p.m. – 7:30 p.m.	President's Reception (Exhibit Hall)

MONDAY, NOVEMBER 13, 2006

7:45 a.m. – 11:30 a.m.	2006 ANS Winter Meeting Opening Plenary – Continental Breakfast [<i>Sponsored by EnergySolutions (We're Part of the Solution)</i>]
8:00 a.m. – 10:00 a.m.	Spouse/Guest Hospitality
8:00 a.m. – 11:30 a.m.	Plenary Session: "Ensuring the Future in Times of Change: Nonproliferation and Security"
9:30 a.m. – 2:30 p.m.	Spouse/Guest Tour: Sandia Peak Tram/Artesian Winery
11:30 a.m. – 6:00 p.m.	ANS Nuclear Technology Expo
11:30 a.m. – 1:00 p.m.	Attendee Luncheon in Nuclear Technology Expo
1:00 p.m. – 2:45 p.m.	ANS President's Special Session: "Perspectives on the Global Nuclear Energy Partnership"
2:45 p.m. – 5:00 p.m.	Technical Sessions – 2006 ANS Winter Meeting
2:45 p.m. – 5:30 p.m.	Opening Plenary Session – NPIC&HMIT 2006
3:00 p.m. – 5:30 p.m.	Opening Plenary Session – TOFE 2006
4:30 p.m. – 6:00 p.m.	Reception in the Nuclear Technology Expo
6:50 p.m. – 10:00 p.m.	Evening Event: Reception at the National Atomic Museum (<i>Co-sponsored by Lockheed Martin on behalf of Sandia National Laboratories</i>)

TUESDAY, NOVEMBER 14, 2006

8:00 a.m. – 10:00 a.m.	Spouse/Guest Hospitality
8:00 a.m. – 11:30 a.m.	Technical Sessions – TOFE 2006
8:30 a.m. – 11:30 a.m.	Technical Sessions – 2006 ANS Winter Meeting
8:30 a.m. – 11:30 a.m.	Technical Sessions – NPIC&HMIT 2006
9:30 a.m. – 2:30 p.m.	Spouse/Guest Tour: Tour of Santa Fe
10:00 a.m. – 2:00 p.m.	ANS Nuclear Technology Expo
11:30 a.m. – 1:00 p.m.	ANS Honors and Awards Luncheon
1:00 p.m. – 3:00 p.m.	Poster Session – TOFE 2006
1:00 p.m. – 4:00 p.m.	Technical Sessions – 2006 ANS Winter Meeting
1:00 p.m. – 4:00 p.m.	Technical Sessions – NPIC&HMIT 2006
3:00 p.m. – 5:00 p.m.	Technical Sessions – TOFE 2006
4:00 p.m. – 6:00 p.m.	General Chair's Special Session: Nonproliferation and Security
6:00 p.m. – 9:00 p.m.	NPIC & HMIT 2006 Banquet (<i>Co-Sponsored by Invenys</i>)
6:00 p.m. – 9:00 p.m.	TOFE 2006 Banquet (<i>Co-Sponsored by Sandia National Laboratories</i>)

WEDNESDAY, NOVEMBER 15, 2006

8:00 a.m. – 10:00 a.m.	Spouse/Guest Hospitality
8:00 a.m. – 11:30 a.m.	Technical Sessions – TOFE 2006
8:30 a.m. – 11:30 a.m.	Technical Sessions – 2006 ANS Winter Meeting
8:30 a.m. – 11:30 a.m.	Technical Sessions – NPIC&HMIT 2006
11:30 a.m. – 1:00 p.m.	Materials Science and Technology Division (MSTD) Awards Luncheon
1:00 p.m. – 4:00 p.m.	Technical Sessions – 2006 ANS Winter Meeting
1:00 p.m. – 4:00 p.m.	Technical Sessions – NPIC&HMIT 2006
1:00 p.m. – 5:00 p.m.	Technical Sessions – TOFE 2006
4:30 p.m. – 6:30 p.m.	Special Session – NPIC&HMIT 2006: "GNEP – I&C Issues–Panel"
6:50 p.m. – 10:00 p.m.	Evening Event: Dinner at El Pinto Restaurant
7:00 p.m. – 9:00 p.m.	Public Information Workshop: "Focus on Communications: Speaking to the Media"

THURSDAY, NOVEMBER 16, 2006

8:30 a.m. – 11:30 a.m.	Technical Sessions – 2006 ANS Winter Meeting
8:30 a.m. – 11:30 a.m.	Technical Sessions – NPIC&HMIT 2006
1:00 p.m. – 4:00 p.m.	Technical Sessions – 2006 ANS Winter Meeting
1:00 p.m. – 4:00 p.m.	Technical Sessions – NPIC&HMIT 2006

FRIDAY, NOVEMBER 17, 2006

8:00 a.m. – 2:30 p.m.	DOE Nuclear Criticality Safety Program
9:00 a.m. – 4:00 p.m.	Technical Tour: Trinity Site

Meeting Officials

Senator Pete Domenici
R, New Mexico
HONORARY CO-CHAIR



Senator Jeff Bingaman
D, New Mexico
HONORARY CO-CHAIR



Michael R. Anastasio
Los Alamos National Laboratory
GENERAL CO-CHAIR



Thomas O. Hunter
Sandia National Laboratories
GENERAL CO-CHAIR



Thomas J. Hirons
Los Alamos National Laboratory
ASSISTANT GENERAL CO-CHAIR



Thomas L. Sanders
Sandia National Laboratories
ASSISTANT GENERAL CO-CHAIR



Raymond H. Gabaldon III
Sandia National Laboratories
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Robert D. Busch
University of New Mexico
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William J. Flor
Los Alamos National Laboratory
FINANCE CHAIR



Brian Miller
Sandia National Laboratories
STUDENT CHAIR



Claudia Gabaldon
SPOUSE CHAIR



Not Pictured:
David L. Chichester,
Idaho National Laboratory,
SPECIAL EVENTS CO-CHAIR

John R. Ireland,
Los Alamos National Laboratory,
SPECIAL EVENTS CO-CHAIR

Will Keener,
Sandia National Laboratories,
MEDIA/OUTREACH CO-CHAIR

Jim Danneskiold,
Los Alamos National Laboratory,
MEDIA/OUTREACH CO-CHAIR

About the Meeting

"Ensuring the Future in Times of Change: Nonproliferation and Security"

The 2006 ANS Winter Meeting will be held November 12-16, 2006, in Albuquerque, NM. There will be two embedded topical meetings held in conjunction with the 2006 ANS Winter Meeting: "17th Topical Meeting on the Technology of Fusion Energy (TOFE)" and "5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology (NPIC&HMIT 2006)." There will also be a Professional Development Workshop held in conjunction with the 2006 ANS Winter Meeting: "Digital Instrumentation Upgrades," as well as the 2006 ANS Student Professional Development Workshop, and the ANS Nuclear Technology Expo.

Accommodations/Hotel Information

There are two hotels, the Hyatt Regency Albuquerque and the Doubletree Hotel Albuquerque, as well as the Albuquerque Convention Center, that will be the location for the 2006 ANS Winter Meeting, where all activities, technical sessions and governance committee meetings will take place.

ANS Nuclear Technology Expo

The ANS Nuclear Technology Expo will be held in conjunction with the 2006 ANS Winter Meeting in the Southwest Exhibit Hall (Convention Center). Additional information is beginning on page 56.

ANS Registration

ANS Registration will be located in the Atrium Foyer (Convention Center) on Saturday, November 11, 2006, through Thursday, November 16, 2006. Meetings and Workshop Registration, Speakers' and 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, NOVEMBER 11, 2006
2:00 p.m. – 5:00 p.m.

SUNDAY, NOVEMBER 12, 2006
7:30 a.m. – 9:30 a.m.*
(*Registration for workshop participants only)
11:00 a.m. – 7:00 p.m.

MONDAY, NOVEMBER 13, 2006
7:30 a.m. – 5:00 p.m.

TUESDAY, NOVEMBER 14, 2006
7:30 a.m. – 5:00 p.m.

WEDNESDAY, NOVEMBER 15, 2006
7:30 a.m. – 5:00 p.m.

THURSDAY, NOVEMBER 16, 2006
7:30 a.m. – 2:00 p.m.



Albuquerque,
New Mexico

2006 ANS Student Professional Development Workshop Mixer

Saturday, November 11, 2006
6:00 p.m. – 8:00 p.m.

Location: Ulam 1 (Doubletree Hotel)

2006 ANS Student Professional Development Workshop

Sunday, November 12, 2006
8:00 a.m. – 12:00 p.m.

Location: Ulam 1 (Doubletree Hotel)

Making the Most of Your ANS Experience

Student members in the ANS have nearly identical opportunities as all other ANS members, but are often at a loss for how to take advantage of them. Held in conjunction with the ANS Winter Meeting, the Student Workshop is designed to provide students with a working understanding of ANS operations, ideas of how to get involved both technically and in Society governance, and an opportunity to meet personally with leaders of the Society and the nuclear industry. The registration fee (\$20) includes dinner on Saturday evening and the Sunday morning workshop. Workshop participants are encouraged to also register for the ANS national meeting, attend technical sessions in their areas of interest, and participate in the mentor program. Additional information is beginning on page 50.

Student Assistant Program

Attendance at the 2006 ANS Winter 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, November 12th, 4:00–5:00 p.m. in the Galisteo Room (Convention Center). Student assistants receive free meeting registration and a copy of the meeting TRANSACTIONS. 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 Jemez Room (Convention Center).

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. The session will be held from 1:00–1:30 p.m. on Sunday, November 12, 2006, in the Zuni Room (Convention Center).

Mentoring Program

A special mentoring program will be held from 5:00–6:00 p.m. on Sunday, November 12, 2006, in the Sandia Room (Convention Center).

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 Atrium Foyer (Convention Center) during registration hours.

A Speakers' Preview Room, the San Juan Room (Convention Center), will be available during the following hours:

SUNDAY, NOVEMBER 12, 2006
12:00 p.m. – 6:00 p.m.

MONDAY, NOVEMBER 13, 2006
7:00 a.m. – 4:00 p.m.

TUESDAY, NOVEMBER 14, 2006
7:00 a.m. – 4:00 p.m.

WEDNESDAY, NOVEMBER 15, 2006
7:00 a.m. – 4:00 p.m.

THURSDAY, NOVEMBER 16, 2006
7:00 a.m. – 12:00 p.m.

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

Conference Office

Location: Isleta Room (Convention Center)

ANS Secretariat

Location: Cutter Room (Doubletree Hotel)

ANS Media Center

MONDAY, NOVEMBER 13, 2006

7:45 a.m. – 4:00 p.m.

TUESDAY, NOVEMBER 14, 2006

8:00 a.m. – 4:00 p.m.

WEDNESDAY, NOVEMBER 15, 2006

8:00 a.m. – 4:00 p.m.

Location: Hardin Boardroom (Doubletree Hotel)

ANS MEDIA WORKROOM

The Public Information Committee will offer individualized sessions to ANS members interested in honing their communication skills. Conducted by experienced media professionals, coaching sessions will feature hands-on practice using videotaped interviews followed by constructive critiques. Candid feedback will help ANS members cultivate their abilities to tell their stories, respond to tough questions, and confidently share their knowledge with news media, policy makers and the public. Sessions will be held Monday through Wednesday between 11:30 a.m. - 1:00 p.m.

PUBLIC INFORMATION WORKSHOP—

“Focus on Communications: Speaking to the Media”

Wednesday, November 15, 2006

7:00 p.m. – 9:00 p.m.

Location: Taos Room (Convention Center)

CHAIR:

Mimi Limbach (PCG)

PRESENTERS:

- Keith Arterburn (Sr. Media Consultant, INL)
- Laura Hermann (Director, PCG)
- Jeff Berger (Communications Director, LANL)
- Will Keener (Communications Director, SNL)

Spouse/Guest Hospitality

Spouse/Guest hospitality breakfast will be served from 8:00–10:00 a.m., Monday, November 13, 2006, through Wednesday, November 15, 2006, in the Sierra Vista Room (19th floor of the Hyatt Regency Hotel). 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 ANS 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, November 14, 2006, there will be a

noncompetitive run starting at 6:00 a.m. from the front entrance of the Albuquerque Convention Center. We are looking forward to seeing you at the fun run in Albuquerque, NM. Bring shoes and a big smile.

Professional Development Workshop

PLEASE NOTE:

Registration for the workshop is separate from, and in addition to, the meeting registration fee.

PROFESSIONAL DEVELOPMENT WORKSHOP:

Digital Instrumentation and Control

Sunday, November 12, 2006

8:00 a.m. – 5:00 p.m.

Location: Ulam 3 (Doubletree Hotel)

Registration price for the workshop is \$450 for ANS Members and \$550 for non-members. Please turn to page 51 for additional information.

DOE Nuclear Criticality Safety Program and “Endusers Focus-Group Workshop”

Friday, November 17, 2006

8:00 a.m. – 2:30 p.m.

Location: Santa Domingo Room (Convention Center)

*Sponsored by the Nuclear Criticality Safety Division
Supported by the Nuclear Criticality Safety Program (NCSP)*

Please turn to page 52 for additional information.

Special Events

PLEASE NOTE: The times listed are departure times and return times to/from the convention center. Buses will leave promptly from the 3rd Street Entrance of the Albuquerque Convention Center.

Plenary Session – Continental Breakfast

MONDAY, NOVEMBER 13, 2006

7:45 a.m. – 11:30 a.m.

Location: Ballrooms B, C (Upper Level, Convention Center)

The Plenary Session – Continental Breakfast (for all meeting attendees) has been generously sponsored by EnergySolutions (We're Part of the Solution).

CONFERENCE LUNCHEONS

Attendee Luncheon in the Nuclear Technology Expo

MONDAY, NOVEMBER 13, 2006

11:30 a.m. – 1:00 p.m.

Location: Southwest Exhibit Hall (Convention Center)

One ticket is included with the full meeting registration. Extra tickets can be purchased at the ANS Registration desk for \$30.

Honors and Awards Luncheon

TUESDAY, NOVEMBER 14, 2006

11:30 a.m. – 1:00 p.m.

Location: Ballroom C (Upper Level, Convention Center)

Plan to attend the Honors and Awards Luncheon held to recognize the outstanding efforts of the award winners and to celebrate their accomplishments. Tickets can be purchased at the ANS Registration desk for \$40.

Materials Science and Technology Division (MSTD) Awards Luncheon

WEDNESDAY, NOVEMBER 15, 2006

11:30 a.m. – 1:00 p.m.

Location: Sendero I (Hyatt Regency Hotel)

Tickets can be purchased at the ANS Registration desk for \$40.

EVENING EVENTS

PLEASE NOTE: You must be registered for the meeting to attend evening events.

ANS President's Reception in the Nuclear Technology Expo

SUNDAY, NOVEMBER 12, 2006

6:00 p.m. – 7:30 p.m.

Location: Southwest Exhibit Hall (Convention Center)

The ANS President's Reception kicks off the meeting on Sunday, November 12, 2006. 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 \$65.

Reception at the National Atomic Museum

MONDAY, NOVEMBER 13, 2006

6:50 p.m. – 10:00 p.m.

The National Atomic Museum is located in the heart of Old Town Albuquerque, along Museum Corridor. The National Atomic Museum is the nation's only Congressionally chartered museum of nuclear science and history. The museum was established in 1969 as an intriguing place to learn the story of the Atomic Age, from early research of nuclear development through today's peaceful uses of nuclear technology. Visitors can explore how nuclear science continues to influence our world. The museum strives to present through permanent and changing exhibits and displays the diverse applications of nuclear energy and its pioneers. Museum visitors can view and photograph displays presenting the development of the Atomic Age, including replicas of the world's first two atomic weapons, Little Boy and Fat Man, which were built and used at the end of World War II.

Tickets can be purchased at the ANS Registration Desk for \$40.

The ticket price has been underwritten by the generous contribution of Lockheed Martin on behalf of Sandia National Laboratories.

Special Events

Banquet – 17th Topical Meeting on the Technology of Fusion Energy

TUESDAY, NOVEMBER 14, 2006

6:00 p.m. – 9:00 p.m.

Location: Ulam Ballroom (Doubletree Hotel)

Tickets can be purchased at the ANS Registration Desk for \$25.

This event is cosponsored by Sandia National Laboratories.

Banquet – 5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology

TUESDAY, NOVEMBER 14, 2006

6:00 p.m. – 9:00 p.m.

Location: Sendero Ballroom (Hyatt Regency Hotel)

BANQUET SPEAKER:

Doug Chapin (*Principal Officer, MPR Associates, Inc.*)

Tickets can be purchased at the ANS Registration Desk for \$25.

This event is cosponsored by INVENSYS.

Dinner at El Pinto Restaurant

WEDNESDAY, NOVEMBER 15, 2006

6:50 p.m. – 10:00 p.m.

Since 1962 the World-Famous El Pinto restaurant has been entertaining heads of state, the Hollywood elite, as well as local patrons with inventive and traditional tastes from the southwest! You will enjoy a southwest banquet buffet, including southwest favorites: red chile cheese enchiladas, green chile chicken enchiladas, Aztec corn, guacamole salad and chile con queso, tostadas and jalapeno salsa, sopapillas and honey, flan – and many other delicious dishes!

Tickets can be purchased at the ANS Registration Desk for \$35.

SPOUSE/GUEST TOURS

“Sandia Peak Tram/Artesian Winery Tour”

MONDAY, NOVEMBER 13, 2006

9:30 a.m. – 2:30 p.m.

This afternoon you board your deluxe coach and head east to the foothills of the Sandia Mountains for a ride on the Sandia Peak Aerial Tramway, the world's longest free-span cable tramway. The 2.7-mile ride to the top will take you through four of the seven life zones found in North America. Traversing these zones is equivalent to taking a trip from Mexico City to Alaska! Once atop Sandia Peak, at an elevation of 10,375 feet above sea level, you will marvel at the thousands of square miles of breathtaking scenery and panoramic views in all directions.

Next, you return to Albuquerque for a tour and wine tasting at an artisan winery. New Mexico's sun soaked soil and cool high desert nights are nearly perfect for



Sandia Peak Tramway – the world's Largest Aerial Tram

the cultivation of grapes and have contributed to the recent revival of wine making in one of the nation's oldest wine producing regions. Enjoy a delicious cheese and fruit platter while sampling these fine wines.

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

“The high desert
bursts with color
as Albuquerque's evergreens
and cactus live in harmony.
The purples and reds
of native plants transform
into fall's brilliant blaze
of reds, oranges and golds
along the Rio Grande
walking and bike trails.”

“Tour of Santa Fe”

TUESDAY, NOVEMBER 14, 2006

9:30 a.m. – 2:30 p.m.

Upon arrival you may take an optional guided walking tour, visiting such points of interest as the Historic Plaza, St. Francis Cathedral, the Loretto Chapel, with its famous “miraculous” staircase, and the San Miguel Mission. Founded in 1610, Santa Fe was the last stop on the Camino Real, the fabled Royal Road that stretched from Mexico City to the northernmost reaches of the Spanish Empire. Today it is the heart and soul of the Southwest, and “Santa Fe Style” is synonymous with all the best the region has to offer. Its historic Plaza, winding streets, covered arcades, hidden gardens and courtyards, and Pueblo-style architecture reflect the blending of Indian, Hispanic, and Anglo cultures.

You may continue to explore on your own or indulge in a southwestern shopping spree at the many unique specialty stores and galleries around the Plaza. Nearly all the city's main cultural attractions are also within walking distance of the Plaza, including the Georgia O'Keeffe Museum and the Palace of the Governors.

Tickets can be purchased at the ANS Registration Desk for \$35 (lunch on your own).

TECHNICAL TOUR

Trinity Site Tour

FRIDAY, NOVEMBER 17, 2006

9:00 a.m. – 4:00 p.m.

On July 16, 1945 the world changed with the explosion of the first atomic bomb. The explosion took place at Trinity Site which is on what is now White Sands Missile Range. The 19-kiloton explosion not only led to a quick end to the war in the Pacific but also ushered the world into the atomic age. All life on earth has been touched by the event which took place here.

The 51,500-acre area was declared a national historic landmark in 1975. The landmark includes base camp, where the scientists and support group lived; ground zero, where the bomb was placed for explosion; and the McDonald ranch house, where the plutonium core to the bomb was assembled.

Trinity is a national historic landmark which is open to the public twice a year. The ANS has scheduled an optional technical tour to the Trinity Site in conjunction with the 2006 ANS Winter Meeting. On the tour, you will see ground zero and the McDonald ranch house. In addition, one of the old instrumentation bunkers is visible beside the road just west of ground zero.

After the Trinity Site tour, you will have lunch at the Owl Bar and Grill in San Antonio, NM. Save room for their special dessert—the pecan pie a la mode.

In order to participate in the tour, you must be registered for the 2006 ANS Winter Meeting. This tour is sold-out!

Technical Sessions by Track

SESSIONS BY TRACK *(Asterisks indicate special sessions)*

Track 1: Ensuring the Future in Times of Change—Nonproliferation and Security

*Opening Plenary: Ensuring the Future in Times of Change—Nonproliferation and Security, Mon. a.m. (8:00–11:30 a.m.)

*ANS President's Special Session: Perspectives on the Global Nuclear Energy Partnership, Mon. p.m. (1:00–2:45 p.m.)

*General Chair's Special Session: Nonproliferation and Security, Tues. p.m. (4:00–6:00 p.m.)

Homeland Security Technologies—I: Radiological Search and Identification, Tues. a.m.

Homeland Security Technologies—II: Consequence Management, Tues. p.m.

Enhancing Safeguards at U.S. Nuclear Sites Through IAEA Additional Protocol—Panel, Tues. a.m.

Closed Fuel Cycle Deployment in Fuel Cycle States: Similarities and Differences—Panel, Tues. a.m.

Nuclear Nonproliferation and International Safeguards Measurement Technologies—I, Wed. a.m.

Nuclear Nonproliferation and International Safeguards Measurement Technologies—II, Wed. p.m.

Safeguarding Radiation Sources and Radioactive Materials, Thurs. a.m.

Track 2: Technology, Management, Operations, and New Construction of Nuclear Systems

Combined Operating License Application Status in the United States—Panel, Tues. p.m.

Advanced Nuclear Energy Systems Including Nuclear Power 2010: Research and Development, Wed. a.m.

Software Safety for Digital Electronics in Nuclear Safety Systems, Thurs. p.m.

Robotics at the U.S. Department of Energy National Laboratories—Panel, Thurs. p.m.

Track 3: Nuclear Fuel Cycle, Waste Management, and Decommissioning Technologies

Technology Innovations Update—Panel, Mon. p.m. (2:55–5:00 p.m.)

Small-Scale Reactors for GNEP—Panel, Tues. a.m.

Nuclear Materials Management and Nonproliferation, Tues. a.m.

Project Status on Decommissioning and Reutilization—Paper/Panel, Tues. a.m.

The Waste Isolation Pilot Plant: An Operating Repository, Tues. p.m.

Recent Developments in Fuel Cycle Modeling and Systems Analysis—I, Wed. a.m.

Recent Developments in Fuel Cycle Modeling and Systems Analysis—II, Thurs. p.m.

Novel Fuel Concepts for Advanced Reactor Systems, Wed. p.m.

Development of Conversion Processes and Remote Fuel Fabrication Capabilities for Transmutation Fuels, Wed. p.m.

Environmental Aspects of the Management of Radioactive Waste, Thurs. a.m.

Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations, Thurs. a.m.

Track 4: Nuclear and Criticality Safety Technologies

Emergency Preparedness and Response, Mon. p.m. (2:55–5:00 p.m.)

Transitioning to Performance-Based Fire Protection (NFPA 805)—Papers/Panel, Tues. p.m.

Data, Analysis, and Operations for Nuclear Criticality Safety—I, Tues. p.m.

Data, Analysis, and Operations for Nuclear Criticality Safety—II, Wed. a.m.

Burnup/Depletion Modeling: Capabilities and Results, Wed. a.m.

Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance and Analysis, Wed. a.m.

Probabilistic Risk Assessment, Wed. p.m.

Use of Hand Calculations in Nuclear Criticality Safety Analyses—Panel, Wed. p.m.

Emerging Topics in Nuclear Installation Safety Technology, Thurs. a.m.

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

Validation: How Much is Enough?, Thurs. p.m.

Track 5: Environmental Science and Technologies

Current Risk Issues in Environmental Cleanup—Panel, Wed. a.m.

Track 6: Nonpower, Medical, and Radiation Applications

Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods, Mon. p.m. (2:55–5:00 p.m.)

Research Reactor Modeling, Tues. a.m.

Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease, Tues. a.m.

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

Nuclear Methods in Support of Nano- to Micro-Domain Sciences, Wed. p.m.

Biology and Medicine: General, Wed. p.m.

Nuclear Archaeometry—I, Thurs. a.m.

Nuclear Archaeometry—II, Thurs. p.m.

Track 7: Nuclear Science and Engineering

Best of RPSD 2006—I, Mon. p.m. (2:55–5:00 p.m.)

Best of RPSD 2006—II, Tues. p.m.

*Inverse Methods for Radiation Transport Problems, Mon. p.m. (2:55–5:00 p.m.)

Transport Methods: General—I, Tues. a.m.

Transport Methods: General—II, Wed. a.m.

Transport Methods: General—III, Wed. p.m.

Radiation Protection and Shielding: General—I, Tues. a.m.

Radiation Protection and Shielding: General—II, Wed. a.m.

General Thermal Hydraulics—I, Tues. a.m.

General Thermal Hydraulics—II, Wed. a.m.

Computational Resources for Radiation Protection and Shielding—I, Tues. p.m.

Computational Resources for Radiation Protection and Shielding—II, Thurs. a.m.

Severe Accident Phenomena and Engineered Features, Tues. p.m.

Reactor Analysis Methods, Tues. p.m.

Technical Sessions by Track

Track 7: Nuclear Science and Engineering (continued)

Reactor Physics Design, Validation, and Operating Experience, Wed. a.m.
Mathematical Modeling: General, Wed. p.m.
Codes for Radiation Shielding and Accelerator Applications, Wed. p.m.
Reactor Physics: General, Wed. p.m.
Contributions of Nuclear Science and Technology to Sustainable Development, Wed. p.m.
General Two-Phase Flow, Thurs. a.m.
Computational Methods: General, Thurs. a.m.
Monte Carlo Tutorial, Thurs. p.m.
Computational Thermal Hydraulics, Thurs. p.m.

Track 8: Emerging Nuclear Technologies, Advanced Energy Research

Continuing Update on the Status of Small Power Reactors—Paper/Panel, Mon. p.m. (2:55–5:00 p.m.)
Reactor Safety: General, Mon. p.m. (2:55–5:00 p.m.)
*Thermal-Hydraulic Limits for Generation IV Reactors—Panel, Mon. p.m. (2:55–5:00 p.m.)
Nuclear Energy Technology for Regions with Water Scarcity—Panel, Tues. a.m.
*Numerical Methods for Radiation Transport in High Energy Density Applications, Tues. p.m.

Track 8: Emerging Nuclear Technologies, Advanced Energy Research (continued)

Use of Nuclear Energy for Hydrogen Production, Tues. p.m.
Critical Technologies for Space Reactor Development, Wed. p.m.
Thermal Hydraulics of Advanced Systems, Wed. p.m.
University Reactor and Nuclear Research—I—Panel, Wed. p.m.
University Reactor and Nuclear Research—II, Thurs. a.m.
Experiments in Support of Accelerator Applications—Papers/Panel, Thurs. a.m.
Materials Science: General, Thurs. a.m.

Track 9: Communication, Education, Training, Public Involvement, and the Nuclear Industry

Diversity in the Workplace—Panel, Mon. p.m. (2:55–5:00 p.m.)
Focus on Communications—I: Pronuclear Activism in Cyberspace—Panel, Mon. p.m. (2:55–5:00 p.m.)
Focus on Communications—II: Pronuclear Communications—Papers/Panel, Tues. p.m.
Focus on Communications—III: What Can We Learn from the Students?—Panel, Tues. p.m.
Get Connected!—Panel, Mon. p.m. (2:55–5:00 p.m.)
Student Design Competition, Mon. p.m. (2:55–5:00 p.m.)
Innovations in Nuclear Engineering Education, Training, and Distance Education, Wed. a.m.
Education and Training: General, Thurs. p.m.

Technical Sessions by Division

SESSIONS BY DIVISION

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

Special Sessions

*Opening Plenary: Ensuring the Future in Times of Change—Nonproliferation and Security, Mon. a.m. (8:00–11:30 a.m.)
*ANS President's Special Session: Perspectives on the Global Nuclear Energy Partnership, Mon. p.m. (1:00–2:45 p.m.)
*General Chair's Special Session: Nonproliferation and Security, Tues. p.m. (4:00–6:00 p.m.)

Accelerator Applications (AAD)

(Codes for Radiation Shielding and Accelerator Applications, Wed. p.m.)
Experiments in Support of Accelerator Applications—Papers/Panel, Thurs. a.m.

Biology and Medicine (BMD)

(Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods, Mon. p.m. [2:55–5:00 p.m.]
Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease, Tues. a.m.
Nuclear Methods in Support of Nano- to Micro-Domain Sciences, Wed. p.m.
Biology and Medicine: General, Wed. p.m.

Decommissioning, Decontamination, and Reutilization (DDR)

Technology Innovations Update—Panel, Mon. p.m. (2:55–5:00 p.m.)
Project Status on Decommissioning and Reutilization—Paper/Panel, Tues. a.m.

Education and Training (ETD)

Diversity in the Workplace—Panel, Mon. p.m. (2:55–5:00 p.m.)
Focus on Communications—I: Pronuclear Activism in Cyberspace—Panel, Mon. p.m. (2:55–5:00 p.m.)
Focus on Communications—II: Pronuclear Communications—Papers/Panel, Tues. p.m.
Focus on Communications—III: What Can We Learn from the Students?—Panel, Tues. p.m.
Student Design Competition, Mon. p.m. (2:55–5:00 p.m.)
Innovations in Nuclear Engineering Education, Training, and Distance Education, Wed. a.m.
Education and Training: General, Thurs. p.m.

Environmental Sciences (ESD)

Emergency Preparedness and Response, Mon. p.m. (2:55–5:00 p.m.)
(Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods, Mon. p.m. [2:55–5:00 p.m.]
Nuclear Energy Technology for Regions with Water Scarcity—Panel, Tues. a.m.
Use of Nuclear Energy for Hydrogen Production, Tues. p.m.
Current Risk Issues in Environmental Cleanup—Panel, Wed. a.m.
Contributions of Nuclear Science and Technology to Sustainable Development, Wed. p.m.
Environmental Aspects of the Management of Radioactive Waste, Thurs. a.m.

Fuel Cycle and Waste Management (FCWMD)

Closed Fuel Cycle Deployment in Fuel Cycle States: Similarities and Differences—Panel, Tues. a.m.
Small-Scale Reactors for GNEP—Panel, Tues. a.m.
Nuclear Materials Management and Nonproliferation, Tues. a.m.

Technical Sessions by Division

Fuel Cycle and Waste Management (FCWMD) (continued)

The Waste Isolation Pilot Plant: An Operating Repository, Tues. p.m.
Recent Developments in Fuel Cycle Modeling and Systems Analysis—I, Wed. a.m.
Recent Developments in Fuel Cycle Modeling and Systems Analysis—II, Thurs. p.m.
Development of Conversion Processes and Remote Fuel Fabrication Capabilities for Transmutation Fuels, Wed. p.m.
(Environmental Aspects of the Management of Radioactive Waste, Thurs. a.m.)
Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations, Thurs. a.m.

Isotopes and Radiation (IRD)

Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods, Mon. p.m. (2:55–5:00 p.m.)
(Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease, Tues. a.m.)
Isotopes and Radiation: General, Tues. p.m.
Nuclear Nonproliferation and International Safeguards Measurement Technologies—I, Wed. a.m.
Nuclear Nonproliferation and International Safeguards Measurement Technologies—II, Wed. p.m.
(Nuclear Methods in Support of Nano- to Micro-Domain Sciences, Wed. p.m.)
(Safeguarding Radiation Sources and Radioactive Materials, Thurs. a.m.)
Nuclear Archaeometry—I, Thurs. a.m.
Nuclear Archaeometry—II, Thurs. p.m.

Materials Science and Technology (MSTD)

(Novel Fuel Concepts for Advanced Reactor Systems, Wed. p.m.)
(Experiments in Support of Accelerator Applications—Papers/Panel, Thurs. a.m.)
Materials Science: General, Thurs. a.m.

Mathematics and Computation (MCD)

*Inverse Methods for Radiation Transport Problems, Mon. p.m. (2:55–5:00 p.m.)
Transport Methods: General—I, Tues. a.m.
Transport Methods: General—II, Wed. a.m.
Transport Methods: General—III, Wed. p.m.
*Numerical Methods for Radiation Transport in High Energy Density Applications, Tues. p.m.
Mathematical Modeling: General, Wed. p.m.
Computational Methods: General, Thurs. a.m.
(Computational Thermal Hydraulics, Thurs. p.m.)

Nuclear Criticality Safety (NCS)

(Emergency Preparedness and Response, Mon. p.m. [2:55–5:00 p.m.])
Data, Analysis, and Operations for Nuclear Criticality Safety—I, Tues. p.m.
Data, Analysis, and Operations for Nuclear Criticality Safety—II, Wed. a.m.
(Burnup/Depletion Modeling: Capabilities and Results, Wed. a.m.)
Use of Hand Calculations in Nuclear Criticality Safety Analyses—Panel, Wed. p.m.
(Emerging Topics in Nuclear Installation Safety Technology, Thurs. a.m.)
Nuclear Criticality Safety Standards—Forum, Thurs. a.m.
Validation: How Much is Enough?, Thurs. p.m.

Nuclear Installations Safety (NISD)

Reactor Safety: General, Mon. p.m. (2:55–5:00 p.m.)
(Emergency Preparedness and Response, Mon. p.m. [2:55–5:00 p.m.])
Enhancing Safeguards at U.S. Nuclear Sites Through IAEA Additional Protocol—Panel, Tues. a.m.
Transitioning to Performance-Based Fire Protection (NFPA 805)—Papers/Panel, Tues. p.m.
(Severe Accident Phenomena and Engineered Features, Tues. p.m.)
Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance and Analysis, Wed. a.m.

Nuclear Installations Safety (NISD) (continued)

Probabilistic Risk Assessment, Wed. p.m.
Emerging Topics in Nuclear Installation Safety Technology, Thurs. a.m.
Software Safety for Digital Electronics in Nuclear Safety Systems, Thurs. p.m.

Operations and Power (OPD)

Continuing Update on the Status of Small Power Reactors—Paper/Panel, Mon. p.m. (2:55–5:00 p.m.)
Combined Operating License Application Status in the United States—Panel, Tues. p.m.
(Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance and Analysis, Wed. a.m.)
Advanced Nuclear Energy Systems Including Nuclear Power 2010: Research and Development, Wed. a.m.
University Reactor and Nuclear Research—I—Panel, Wed. p.m.
University Reactor and Nuclear Research—II, Thurs. a.m.

Radiation Protection and Shielding (RPSD)

Best of RPSD 2006—I, Mon. p.m. (2:55–5:00 p.m.)
Best of RPSD 2006—II, Tues. p.m.
Radiation Protection and Shielding: General—I, Tues. a.m.
Radiation Protection and Shielding: General—II, Wed. a.m.
Homeland Security Technologies—I: Radiological Search and Identification, Tues. a.m.
Homeland Security Technologies—II: Consequence Management, Tues. p.m.
Computational Resources for Radiation Protection and Shielding—I, Tues. p.m.
Computational Resources for Radiation Protection and Shielding—II, Thurs. a.m.
Burnup/Depletion Modeling: Capabilities and Results, Wed. a.m.
Codes for Radiation Shielding and Accelerator Applications, Wed. p.m.
Safeguarding Radiation Sources and Radioactive Materials, Thurs. a.m.
Monte Carlo Tutorial, Thurs. p.m.

Reactor Physics (RPD)

Research Reactor Modeling, Tues. a.m.
Reactor Analysis Methods, Tues. p.m.
(Burnup/Depletion Modeling: Capabilities and Results, Wed. a.m.)
Reactor Physics Design, Validation, and Operating Experience, Wed. a.m.
Reactor Physics: General, Wed. p.m.
(Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations, Thurs. a.m.)

Robotics and Remote Systems (RRSD)

Robotics at the U.S. Department of Energy National Laboratories—Panel, Thurs. p.m.

Thermal Hydraulics (THD)

*Thermal-Hydraulic Limits for Generation IV Reactors—Panel, Mon. p.m. (2:55–5:00 p.m.)
General Thermal Hydraulics—I, Tues. a.m.
General Thermal Hydraulics—II, Wed. a.m.
Severe Accident Phenomena and Engineered Features, Tues. p.m.
Thermal Hydraulics of Advanced Systems, Wed. p.m.
General Two-Phase Flow, Thurs. a.m.
Computational Thermal Hydraulics, Thurs. p.m.

Aerospace Nuclear Science and Technology Technical Working Group (ANST)

Critical Technologies for Space Reactor Development, Wed. p.m.
Novel Fuel Concepts for Advanced Reactor Systems, Wed. p.m.

Professional Women of American Nuclear Society (PWANS)

(Diversity in the Workplace—Panel, Mon. p.m. [2:55–5:00 p.m.])

Young Members Group (YMG)

Get Connected! —Panel, Mon. p.m. (2:55–5:00 p.m.)

Condensed Meeting Schedule

ROOM	MONDAY, NOVEMBER 13, 2006			TUESDAY, NOVEMBER 14, 2006		
	8:00–11:30 AM	1:00–2:45 PM	2:45–5:00 PM	8:30–11:30 AM	1:00–4:00 PM	4:00–6:00 PM
Ballrooms B, C	Opening Plenary: Ensuring the Future in Times of Change— Nonproliferation and Security	ANS President's Session: Perspectives on the Global Nuclear Energy Partnership				General Chair's Special Session: Nonproliferation and Security (Location - Ballroom C)
Acoma			Diversity in the Workplace—Panel	Transport Methods: General—I	Numerical Methods for Radiation Transport in High Energy Density Applications	
Zuni			Continuing Update on the Status of Small Power Reactors—Paper/ Panel	Radiation Protection and Shielding: General—I	Computational Resources for Radiation Protection and Shielding—I	
Tesuque			Best of RPSD 2006—I	Homeland Security Technologies—I: Radiological Search and Identification	Homeland Security Technologies—II: Consequence Management	
Cochiti			Reactor Safety: General	Enhancing Safeguards at U.S. Nuclear Sites Through IAEA Additional Protocol— Panel	Transitioning to Performance-Based Fire Protection (NFPA 805)— Papers/Panel	
Taos			Thermal-Hydraulic Limits for Generation IV Reactors—Panel	General Thermal Hydraulics—I	Severe Accident Phenomena and Engineered Features	
Nambe/Navajo			Inverse Methods for Radiation Transport Problems	Closed Fuel Cycle Deployment in Fuel Cycle States: Similarities and Differences—Panel	Data, Analysis, and Operations for Nuclear Criticality Safety—I	
Picuris			Technology Innovations Update—Panel	Research Reactor Modeling	Reactor Analysis Methods	
Sandia			Focus on Communications—I: Pronuclear Activism in Cyberspace—Panel	Small-Scale Reactors for GNEP—Panel	Combined Operating License Application Status in the United States—Panel	
Santa Ana			Emergency Preparedness and Response	Nuclear Energy Technology for Regions with Water Scarcity— Panel	Use of Nuclear Energy for Hydrogen Production	
Laguna			Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods	Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease	Isotopes and Radiation: General	
Santo Domingo			Get Connected!—Panel	Nuclear Materials Management and Nonproliferation	The Waste Isolation Pilot Plant: An Operating Repository	
Apache			Student Design Competition	Project Status on Decommissioning and Reutilization—Papers/ Panel	Focus on Communications—II: Pronuclear Communications— Papers/Panel Focus on Communications—III: What Can We Learn from the Students?— Panel	

Condensed Meeting Schedule

ROOM	WEDNESDAY, NOVEMBER 15, 2006		THURSDAY, NOVEMBER 16, 2006	
	8:30–11:30 AM	1:00–4:00 PM	8:30–11:30 AM	1:00–4:00 PM
Ballrooms B, C				
Acoma	Transport Methods: General—II	Transport Methods: General—III Mathematical Modeling: General	Experiments in Support of Accelerator Applications—Papers/ Panel	
Zuni	Radiation Protection and Shielding: General—II	Critical Technologies for Space Reactor Development Novel Fuel Concepts for Advanced Reactor Systems	Computational Resources for Radiation Protection and Shielding—II	Education and Training: General
Tesuque	Burnup/Depletion Modeling: Capabilities and Results	Codes for Radiation Shielding and Accelerator Applications	Safeguarding Radiation Sources and Radioactive Materials	
Cochiti	Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance and Analysis	Probabilistic Risk Assessment	Emerging Topics in Nuclear Installation Safety Technology	Monte Carlo Tutorial
Taos	General Thermal Hydraulics—II	Thermal Hydraulics of Advanced Systems	General Two-Phase Flow	Computational Thermal Hydraulics
Nambe/Navajo	Data, Analysis, and Operations for Nuclear Criticality Safety—II	Use of Hand Calculations in Nuclear Criticality Safety Analyses—Panel	Nuclear Criticality Safety Standards—Forum	Nuclear Archaeometry—II Validation: How Much Is Enough?
Picuris	Reactor Physics Design, Validation and Operating Experience	Reactor Physics: General	Computational Methods: General Materials Science: General	Software Safety for Digital Electronics in Nuclear Safety Systems
Sandia	Advanced Nuclear Energy Systems Including Nuclear Power 2010: Research and Development	University Reactor and Nuclear Research—I—Panel	University Reactor and Nuclear Research—II	
Santa Ana	Current Risk Issues in Environmental Cleanup—Panel	Contributions of Nuclear Science and Technology to Sustainable Development	Environmental Aspects of the Management of Radioactive Waste	Recent Developments in Fuel Cycle Modeling and Systems Analysis—II
Laguna	Nuclear Nonproliferation and International Safeguards Measurement Technologies—I	Nuclear Nonproliferation and International Safeguards Measurement Technologies—II	Nuclear Archaeometry—I	Robotics at the U.S. Department of Energy National Laboratories—Panel
Santo Domingo	Recent Developments in Fuel Cycle Modeling and Systems Analysis—I	Development of Conversion Processes and Remote Fuel Fabrication Capabilities for Transmutation Fuels	Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations	
Apache	Innovations in Nuclear Engineering Education, Training, and Distance Education	Nuclear Methods in Support of Nano- to Micro-Domain Sciences Biology and Medicine: General		

Technical Sessions by Day (Monday)

MONDAY • NOVEMBER 13, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
7:45 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY – CONTINENTAL BREAKFAST [Sponsored by EnergySolutions (We're Part of the Solution)]
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY "Ensuring the Future in Times of Change: Nonproliferation and Security"
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: "Sandia Peak Tram/Artesian Winery"
11:30 AM - 6:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	ATTENDEE LUNCHEON IN THE ANS NUCLEAR TECHNOLOGY EXPO
1:00 PM - 2:45 PM	ANS PRESIDENT'S SPECIAL SESSION "Perspectives on the Global Nuclear Energy Partnership"
2:45 PM - 5:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS • Diversity in the Workplace—Panel • Continuing Update on the Status of Small Power Reactors—Paper/Panel • Best of RPSD 2006—I • Reactor Safety: General • Thermal-Hydraulic Limits for Generation IV Reactors—Panel • Inverse Methods for Radiation Transport Problems • Technology Innovations Update—Panel • Focus on Communications—I: Pronuclear Activism in Cyberspace—Panel • Emergency Preparedness & Response • Recent Developments in Metrological & Quality Assurance Aspects of Nuclear Analytical Methods • Get Connected!—Panel • Student Design Competition
2:45 PM - 5:30 PM	NPIC&HMIT 2006: OPENING PLENARY SESSION (see pg 41)
3:00 PM - 5:30 PM	TOFE 2006: OPENING PLENARY SESSION (see pg 32)
4:30 PM - 6:00 PM	RECEPTION IN THE ANS NUCLEAR TECHNOLOGY EXPO
6:50 PM - 10:00 PM	EVENING EVENT: "Reception at the National Atomic Museum" (Cosponsored by Lockheed Martin on behalf of Sandia National Laboratories)

MONDAY, NOVEMBER 13, 2006 • 8:00 A.M.

Opening Plenary: Ensuring the Future in Times of Change—Nonproliferation and Security. *Cochairs:* Michael R. Anastasio (*LANL*), Thomas G. Hunter (*SNL*) [Track 1]

Ballrooms B, C
8:00 a.m.

OPENING REMARKS AND PRESENTATIONS:

Harold McFarlane (*President, American Nuclear Society*)

WELCOME AND REMARKS:

- Tom Hunter (*Director, SNL, and General Cochair, 2006 ANS Winter Meeting*)
- Michael Anastasio (*Director, LANL, and General Cochair, 2006 ANS Winter Meeting*)

VIDEO

President G. W. Bush (*President, United States of America*)

REMARKS:

- Senator Pete Domenici (*R, New Mexico, and Honorary Cochair, 2006 ANS Winter Meeting*)
- Senator Jeff Bingaman (*D, New Mexico, and Honorary Cochair, 2006 ANS Winter Meeting*)
- Senator J. Bennett Johnston (*Johnston and Associates, LLC*)
- Dale Klein (*Chairman, U.S. NRC*)

Q&A and Closing

MONDAY, NOVEMBER 13, 2006 • 1:00 P.M.

ANS President's Special Session: Perspectives on the Global Nuclear Energy Partnership. *Chair:* Harold F. McFarlane (*President, American Nuclear Society*) [Track 1]

Ballrooms B, C
1:00 p.m.

Welcome and Remarks

REMARKS – Dennis Spurgeon (*Assistant Secretary for Nuclear Energy, U.S. Department of Energy*)

REMARKS – Craig Hansen (*Vice President, Washington Operations, BWX Technologies, Inc.*)

REMARKS – Reinhard Hinterreither (*President and CEO, National Enrichment Facility*)

Q&A and Closing

MONDAY, NOVEMBER 13, 2006 • 2:45 P.M.

Diversity in the Workplace—Panel, sponsored by ETD; cosponsored by PWANS. *Cochairs:* Kimberly A. Keithline (*NEI*), Carolyn Heising (*Iowa State Univ*) [Track 9]

Acoma
2:45 p.m.

This session will report on the status of under-represented minorities and women in the nuclear workplace. The nuclear workplace is intended to be constructed in a broad sense; the session will consider diversity of students, faculty, and administrators of nuclear educational programs, as well as workers in the nuclear industry and in the sectors of the government that deal with nuclear issues. The goal of this session is to provide information to motivate women and minorities to establish and achieve professional goals. Feedback from panelists and the audience is desired to help establish initiatives within the American Nuclear Society (ANS), the Professional Women in ANS Committee, and the Young Members Group to facilitate the success of women and minorities in the broad context of the nuclear industry. The discussions will include advice for women and minorities in developing leadership skills to enable them to move up into higher levels of management and responsibility (e.g., vice presidents, government, SES, tenured faculty).

PANELISTS:

- Bernadette Kirk (*ORNL*)
- Garry Harris (*HTS*)
- Auddeen Fentimen (*Purdue Univ*)
- Cindy Carpenter (*NRC*)

Continuing Update on the Status of Small Power Reactors—Paper/Panel, sponsored by OPD. *Chair:* Chris Lapp (*Lapp Consult Svc*) [Track 8]

Zuni
2:45 p.m.
PAPER

Commercial Applications for Small Nuclear Reactors in the Extraction of Oil Sand and Oil Shale, Philip O. Moor (*Burns and Roe*), John O'Brien (*SASOR*)

3:10 p.m.

PANEL DISCUSSION

Small reactors are a viable alternative to meet the energy needs of the future. This panel session will provide a continuing status update as to the challenges involved in such a process including the research and design, licensing process, legal issues, and overall management requirements.

PANELISTS:

- Philip Moor (*Burns and Roe*)
- John O'Brien (*SASOR*)
- Christopher Lapp (*Lapp Consult Svc*)
- Marvin Yoder (*Assistant to the Mayor, Galena, Alaska*)
- Matias Travesio-Diaz (*Pillsbury, Winthrop, Shaw Pittman*)
- Yoshiaki Sakoshita (*Toshiba*)
- Nobuyuki Ueda (*CRIEPI*)

Best of RPSD 2006—I, sponsored by RPSD. *Session Organizer:* Robert B. Hayes (*Bechtel Nevada*). *Chair:* Robert B. Hayes [Track 7]

Tesuque
2:45 p.m.

Advances in Monte Carlo Depletion Capabilities for MCNPX, Michael L. Fensin (*LANL/Univ of Florida*), John S. Hendricks, Gregg W. McKinney, Holly Trelue (*LANL*)

3:10 p.m.

Validation of Nuclear Data Using Lawrence Livermore Pulsed Sphere Experiments, Wim Haeck, Bernard Verboom (*SCK/CEN*)

3:35 p.m.

Peculiarities of Radiation Shielding Analyses for the ITER ECRH Launcher, A. Serikov, U. Fischer, H. Tsige-Tamirat (*FZK*), invited

Technical Sessions by Day (Monday)

4:00 p.m.

Preliminary Investigations into Lunar Surface Power Reactor Shielding Strategies, Jeffrey O. Johnson, Charles O. Slater, Edward D. Blakeman (*ORNL*)

4:25 p.m.

Monte Carlo Calculations of Spacecraft Fluxes, Keran O'Brien (*Northern Arizona Univ*)

Reactor Safety: General, sponsored by NISD. *Session Organizer:* Raymond Gallucci (*NRC*). *Chair:* Randall Gauntt (*SNL*) [Track 8]

Cochiti

2:45 p.m.

A New Air Oxidation Model for Spent Fuel Pool Safety Analysis, K. C. Wagner, R. O. Gauntt, E. R. Lindgren, S. Durbin (*SNL*)

3:10 p.m.

Hydraulic Analysis of a Prototypic BWR Spent Fuel Assembly in Laminar Flow, S. G. Durbin, E. R. Lindgren (*SNL*)

3:35 p.m.

Thermal-Hydraulic Response of a Prototypic BWR Spent Fuel Assembly Under Naturally Convective Conditions, S. G. Durbin, E. R. Lindgren, K. C. Wagner (*SNL*)

4:00 p.m.

Measured and Modeled Turbomachinery Operating Characteristics in a Closed-Brayton Cycle Test Loop, Steven A. Wright, Nicholas R. Brown, Andrew J. March (*SNL*)

4:25 p.m.

Estimation of Fission Product Release from TRISO, Hyedong Jeong, Yong Hoon Jeong, Soon Heung Chang (*KAIST*)

Thermal-Hydraulic Limits for Generation IV Reactors—Panel

sponsored by THD. *Session Organizers:* Lawrence Hochreiter (*Penn State*), Chang Oh (*INL*), Kune Y. Suh (*Seoul Natl Univ*). *Cochairs:* Chang Oh, Lawrence Hochreiter [Track 8]

Taos

2:45 p.m.

One of the key features of the Generation IV (Gen-IV) reactor designs is much higher core exit and operating temperatures. There are two goals for the high core exit temperatures. The first goal is a nuclear design that can have the same or greater thermodynamic cycle efficiencies as compared to current fossil power plants. This means cycle efficiencies in the 42 to 48% range as compared to the current light water reactor cycle efficiencies, which range from 32 to 36%. The second goal is to use the high core exit temperatures for the less costly generation of hydrogen, which then can be used for transportation purposes.

High core exit temperatures put a burden on reactor thermal hydraulics, materials, reactor control, and safety. This panel session will focus on the thermal-hydraulics design and limits for the Gen-IV designs: what new technologies need to be developed to predict these designs and the corresponding limits with confidence or what new improvements in current technologies are needed to have confidence in the prediction of the reactor design and limits. While the focus will be on thermal-hydraulics issues, questions on materials, control, and safety will also be discussed since these also limit the Gen-IV designs.

PANELISTS:

- Gas-Cooled Fast Reactor, Tom Wei (*ANL*)
- Molten Salt Reactor, Per Peterson (*Univ of California, Berkeley*)
- Very-High-Temperature-Cooled Reactor, Richard Schultz (*INL*)
- Supercritical-Water-Cooled Reactor, James Wolf (*INL*)
- Sodium-Cooled Fast Reactor, Jim Cahalan (*ANL*)
- Lead-Cooled Fast Reactor, James Sienicki (*ANL*)

Inverse Methods for Radiation Transport Problems, sponsored by MCD. *Session Organizer:* Jeffrey A. Favorite (*LANL*). *Chair:* Jeffrey A. Favorite [Track 7]

Nambe/Navajo

2:45 p.m.

CEARCPG: A Monte Carlo Simulation Code for Normal and Coincidence Prompt Gamma-Ray Neutron Activation Analysis (PGNAA), Xiaogang Han (*Baker Atlas*), Robin P. Gardner (*NCSU*), invited, Mark Mills Award Winner

3:10 p.m.

Inverse Source Problems in Linear Transport Theory, R. Sanchez (*CEA*), N. J. McCormick (*Univ of Washington*), invited

3:35 p.m.

The Inverse Source Problem in Optical Molecular Imaging, Alexander D. Klose (*Columbia Univ*), invited

4:00 p.m.

Using the Levenberg-Marquardt Method for the Solution of Inverse Transport Problems, Jeffrey A. Favorite (*LANL*), David I. Ketcheson (*Univ of Washington*)

4:25 p.m.

The Inverse Monte Carlo Formalism for Solving Inverse Radiation Problems, William L. Dunn (*Kansas State Univ*), invited

4:50 p.m.

Some Advances on Inverse Particle Transport Problems with Applications to Homeland Security, Gregory Thoreson, Jean C. Ragusa, Wolfgang Bangerth (*Texas A&M*), invited

Technology Innovations Update—Panel, sponsored by DDRD. *Chair:*

Larry Zull (*DNFSB*) [Track 3]

Picuris

2:45 p.m.

The purpose of this session is to help advance the technology of decommissioning, decontamination, reutilization, and long-term surveillance and maintenance of nuclear and formerly nuclear installations, materials, facilities, and sites in the following areas: development and use of new and improved technology; development of new engineering practices; planning; cost estimating; allocation of funding; review and input to applicable environmental compliance issues, including site restoration and legacy management, and applicable waste management issues, including mixed waste (radioactive and hazardous waste); transportation; preparation of standards and policy statements; and closely related activities, such as nuclear accountability liabilities, safeguards, licensing, and regulations.

PANELISTS:

- Arthur Derosier (*Dade Moeller & Associates*)
- Kevin Taylor (*Energy Solutions*)
- Joe Shonka (*Shonka Research Associates, Inc.*)
- Jeff Lively (*Mactec*)
- Dick Meservey (*INL*)

Focus on Communications—I: Pronuclear Activism in Cyberspace—Panel

sponsored by ETD. *Chair:* Lisa Stiles-Shell (*NEI*) [Track 9]

Sandia

2:45 p.m.

The electric power industry is beginning to consider the construction and operation of a new generation of nuclear power plants to ensure continuity of power supplies and to provide for the growing energy needs of the United States. The public debate over the safety and viability of nuclear energy is rapidly returning to a position of high visibility to the public. In most cases the arguments being leveled against new nuclear generation capacity have not significantly changed since the peak of U.S. construction several decades ago. However, the supporters of nuclear power are taking a more active role, expanding the focus of their efforts beyond the scientific education of future generations to include communication with all affected individuals. This session will highlight current activities of pronuclear activists throughout the nation and the industry, focusing on the use of the new electronic media.

Technical Sessions by Day (Monday & Tuesday)

PANELISTS:

- Eric McErlain (*NEI Nuclear Notes*)
- Randall Parker (*FuturePundit*)
- Rod Adams (*Atomic Insights*)
- John Wheeler (*This Week in Nuclear*)

Emergency Preparedness and Response, sponsored by ESD; cosponsored by NCS, NISD. *Session Organizer:* Rebecca Steinman (*Advent Eng*). *Chair:* Greg Hostetter (*Advent Eng*). [Track 4]

Santa Ana

2:45 p.m.

A 12-Point Response to a Dirty Bomb Attack, James Conca (*New Mexico State Univ*)

3:10 p.m.

Inverse Depletion/Decay Analysis Using the SCALE Code System, C. F. Weber, B. L. Broadhead (*ORNL*)

3:35 p.m.

Preliminary Scoping Study of Potential Impacts to Drinking Water and Wastewater Systems from Radiological Dispersal Events, F. A. Monette, B. M. Biver, D. Tomasko, S. Y. Chen (*ANL*), J. MacKinney, R. Janke (*EPA*)

Recent Developments in Metrological and Quality Assurance Aspects of Nuclear Analytical Methods, sponsored by IRD; cosponsored by BMD, ESD. *Session Organizer:* Robert Greenberg (*NIST*). *Chair:* Robert Greenberg [Track 6]

Laguna

2:45 p.m.

Neutron Self-Shielding Factors for Simple Geometries—Revisited, Richard M. Lindstrom (*NIST*)

3:10 p.m.

Quality Assurance in Neutron Detector Development by Neutron Depth Profiling, Daniel A. Clayton (*Davidson College*), Jeffrey L. Lacy (*Proportional Technol*), R. Gregory Downing (*NIST*)

3:35 p.m.

Development of a Tropical Forest Reference Material for Environmental Studies, Elvis J. De França, Elisabete A. De Nadai Fernandes, Márcio A. Bacchi, Fábio S. Tagliaferro (*Univ of São Paulo*), Peter Bode (*Delft UT*)

4:00 p.m.

Accuracy and Instrumental Neutron Activation Analysis—How Well Can INAA Perform in an International Comparison?, Robert Greenberg, Elizabeth Mackey, Rolf Zeisler (*NIST*)

4:25 p.m.

A Compton Suppression System with an Automated Sample Changer, L. Welch, S. Landsberger (*Univ of Texas, Austin*)

Get Connected!—Panel, sponsored by YMG. *Session Organizers:* Amy Buu (*Westinghouse*), David Pointer (*ANL*). *Cochairs:* Amy Buu, David Pointer [Track 9]

Santo Domingo

2:45 p.m.

As a consequence of current nuclear science and technology workforce realities, young nuclear professionals often find themselves in positions of significant responsibility as soon as they enter the workforce. One of the challenges identified as the most significant in the American Nuclear Society 2004 Winter Meeting session “Challenges Facing the Young Generation in Nuclear” was the lack of networking skills. Networking is a skill that can help throughout one’s career; however, many company development programs focus on the technical skills needed for their employees and offer very little training for the “soft skills.” Through the means of an interactive seminar, North American Young Generation in Nuclear will provide valuable tips from the more experienced “networkers” and opportunities to help hone the participants’ networking skills.

PANELISTS:

- Amy Buu (*Westinghouse*)
- David Pointer (*ANL*)
- Michael Stuart (*Dominion Eng*)

Student Design Competition, sponsored by ETD. *Session Organizer:* H. Lee Dodds (*Univ of Tennessee*). *Chair:* H. Lee Dodds [Track 9]

Apache

The following entries have been selected by a panel of judges from industry as finalists in the 2006 Student Design Competition. Oral presentations will be made by students in front of a second panel of judges who will determine the first and second place in each category.

UNDERGRADUATE CATEGORY

2:45 p.m.

Use of Zirconium Hydride Fuel for Improved BWR Core Designs, M. Robel, L. Im, H. Kim, P. Monasterio, R. Petroski, B. E. Rosenberg (*Univ of California, Berkeley*)

3:10 p.m.

Optimum Loading Pattern Design and Analysis Considerations, A. S. Bielen, M. J. Meholic, D. J. Skilone (*Penn State*)

GRADUATE CATEGORY

3:35 p.m.

Heat Pipe Encapsulated Nuclear Heat Source Reactor (HP-ENHS), Massimiliano Fratoni, Lance Kim, Sara Mattafirri, Robert Petroski (*Univ of California, Berkeley*)

4:00 p.m.

Investigation, Design and Analysis of a Fast Neutron Facility on Beam Port 4 at The University of Texas MARK II TRIGA Reactor, E. Alvarez, D. Haas, K. Jackman, S. Whitney, S. Wilson (*Univ of Texas, Austin*)

TUESDAY • NOVEMBER 14, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
8:30 AM - 11:30 AM	2006 ANS WINTER MEETING TECHNICAL SESSIONS
	• Transport Methods: General—I
	• Radiation Protection & Shielding: General—I
	• Homeland Security Technologies—I: Radiological Search & Identification
	• Enhancing Safeguards at U.S. Nuclear Sites Through IAEA Additional Protocol—Panel
	• General Thermal Hydraulics—I
	• Closed Fuel Cycle Deployment in Fuel Cycle States: Similarities & Differences—Panel
	• Research Reactor Modeling
	• Small-Scale Reactors for GNEP—Panel
	• Nuclear Energy Technology for Regions with Water Scarcity—Panel
	• Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease
	• Nuclear Materials Management & Nonproliferation
	• Project Status on Decommissioning & Reutilization—Papers/Panel
8:30 AM - 11:30 AM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: “Sante Fe”
10:00 AM - 2:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	HONORS AND AWARDS LUNCHEON
1:00 PM - 3:00 PM	TOFE 2006 POSTER SESSION (see pg 32)
1:00 PM - 4:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS
	• Numerical Methods for Radiation Transport in High Energy Density Applications
	• Best of RPSD 2006—II
	• Computational Resources for Radiation Protection & Shielding—I
	• Homeland Security Technologies—II: Consequence Management
	• Transitioning to Performance-Based Fire Protection (NFFA 805)—Papers/Panel
	• Severe Accident Phenomena & Engineered Features
	• Data, Analysis, & Operations for Nuclear Criticality Safety—I
	• Reactor Analysis Methods
	• Combined Operating License Application Status in the United States—Panel
	• Use of Nuclear Energy for Hydrogen Production
	• Isotopes and Radiation: General
	• The Waste Isolation Pilot Plant: An Operating Repository
	• Focus on Communications—II: Nonuclear Communications—Papers/Panel
	• Focus on Communications—III: What Can We Learn from the Students?—Panel
1:00 PM - 4:00 PM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
3:00 PM - 5:00 PM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
4:00 PM - 6:00 PM	GENERAL CHAIR’S SPECIAL SESSION: “Nonproliferation and Security”
6:00 PM - 9:00 PM	NPIC&HMIT 2006 BANQUET (Cosponsored by INVENSYS)
6:00 PM - 9:00 PM	TOFE 2006 BANQUET (Cosponsored by Sandia National Laboratories)

Technical Sessions by Day (Tuesday)

TUESDAY, NOVEMBER 14, 2006 • 8:30 A.M.

Transport Methods: General—I, sponsored by MCD. *Session Organizer:* Dmitriy Y. Anistratov (NCSU). *Chair:* James Warsa (LANL) [Track 7]

Acoma

8:30 a.m.

Discrete Diffusion Monte Carlo for XY Adaptive Mesh Refinement-Style Meshes, Jeffrey D. Densmore, Thomas M. Evans, Michael W. Buksas (LANL)

8:55 a.m.

A Critique of the Levermore-Pomraning Equation, A. Ziya Akcasu (Univ of Michigan)

9:20 a.m.

Asymptotic Diffusion Limit of a Modified Levermore-Pomraning Theory, Edward W. Larsen (Univ of Michigan)

9:45 a.m.

Multigroup Formulation of the "Corrector" Hybrid Monte Carlo/Deterministic Transport Method, Troy L. Becker, Edward W. Larsen (Univ of Michigan)

10:10 a.m.

Nonlinear Quasidiffusion Acceleration Methods with Independent Discretization, Dmitriy Y. Anistratov (NCSU)

10:35 a.m.

Krylov Acceleration for Transport in Binary Statistical Media, Erin D. Fichtl (Univ of New Mexico), James S. Warsa (LANL), Anil K. Prinja (Univ of New Mexico)

Radiation Protection and Shielding: General—I, sponsored by RPSD. *Session Organizer:* John S. Hendricks (LANL). *Chair:* Michael R. James (LANL) [Track 7]

Zuni

8:30 a.m.

Aluminum, B₄C and Polymer Shielding for 100 MeV Protons, Tai T. Pham, Mohamed S. El-Genk, Marwan Al-Haik (Univ of New Mexico)

8:55 a.m.

MCNPX Dose Analysis for a Dense Plasma Focus Neutron Source, Robert O'Brien, William Culbreth (UNLV)

9:20 a.m.

Calculation of Activation Products in Control Rods for Shipment Characterization and Shielding, Herschel P. Smith (Duke Power)

9:45 a.m.

Electric Current Generated by a High Energy Electron Beam Hitting a GEM Detector, B. S. Moon, C. H. Hahn, D. S. Yoo, I. G. Kim, S. T. Park (Changwon Natl Univ), C. E. Chung, D. Y. Lee, K. C. Kwon, Y. W. Han, B. C. Lee (KAERI), J. Li, J. Yu, A. P. White (Univ of Texas, Arlington)

10:10 a.m.

Activity Evaluation System Using Shape Measurement and Monte-Carlo Methods, Michiya Sasaki, Takatoshi Hattori (CRIEPI)

10:35 a.m.

New Radiological Transport HPAC Package within the HPAC Framework, Robert Sanders (ORNL), Jim Furlong (L-3 Comm/Titan Grp)

Homeland Security Technologies—I: Radiological Search and Identification, sponsored by RPSD. *Session Organizers:* Raymond Klann (ANL), Tim Brown (SRNL). *Chair:* Raymond Klann [Track 1]

Tesuque

8:30 a.m.

Results and Characteristics of the Homeland Security Office of Research and Development Radiological and Nuclear Countermeasures Program, Thomas E. Kiess (U.S. Dept. of Homeland Security)

8:55 a.m.

Detection of HEU Using a Pulsed Inertial Electrostatic Confinement D-D Fusion Device, R. F. Radel, G. L. Kulcinski, R. P. Ashley, J. F. Santarius, G. R. Piefer, D. R. Boris, R. Giar, B. Egle, C. Seyfert, S. J. Zenobia, E. Alderson (Univ of Wisconsin, Madison)

9:20 a.m.

SFM Detection in Small Watercraft Using Differential Die-Away, Norman A. Johansen III, William S. Charlton (Texas A&M)

9:45 a.m.

Optimization of Fission Product Identification Using Compton Suppression and Gamma-Gamma Coincidence, S. Landsberger, P. Gray, G. Nicholson (Univ of Texas, Austin), R. Gritz (LANL)

10:10 a.m.

Plastic Scintillator Response Matrix for Spectral Unfolding of Gamma Ray Energy, E. Burgett, N. Hertel (Georgia Tech)

10:35 a.m.

Intelligent Sensor Management in Nuclear Searches and Radiological Surveys, A. V. Klimenko, W. C. Priedhorsky (LANL), H. Tanner (Univ of New Mexico), K. N. Borozdin, N. Hengartner (LANL)

Enhancing Safeguards at U.S. Nuclear Sites Through IAEA Additional Protocol-Panel, sponsored by NISD. *Session Organizer:* Linda Hansen (ANL). *Chair:* Linda Hansen [Track 1]

Cochiti

8:30 a.m.

In 1998 the United States signed the Additional Protocol (AP) with the International Atomic Energy Agency (IAEA). The AP is designed to supplement the Nonproliferation Treaty by increasing the authority and expanding the activities of the IAEA. The intent of the AP is to strengthen the IAEA's ability to detect clandestine military nuclear programs in nonnuclear weapons states. The AP requires information about nuclear fuel cycle-related research and development activities that do not involve nuclear material (and therefore are not reported under traditional safeguards) as well as additional information about manufacture, imports, and exports of certain dual-use technology; further information about existing sites; and information about mines and depleted and natural uranium. This new information helps the IAEA understand the direction and ambition of a country with respect to its nuclear program. The AP fills the gap that traditional safeguards could not address. On March 31, 2004, the U.S. Senate gave its positive advice and consent to ratification for the AP. This session will address the implementation of the AP within the United States and how the requirements of the AP will affect declarations from U.S. Department of Energy/National Nuclear Security Administration sites, utilities, universities, and commercial facilities that engage in AP-specific related activities.

PANELISTS:

- Jo Anna Sellen (DOE)
- Steve Adams (U.S. Dept of State)
- Bruce Moran (NRC)
- Representative from U.S. Department of Commerce to be determined.

General Thermal Hydraulics—I, sponsored by THD. *Session Organizers:* Yassin Hassan (Texas A&M), Fan-Bill Cheung (Penn State), Undine Shoop (NRC). *Cochairs:* Yassin Hassan, Undine Shoop [Track 7]

Taos

8:30 a.m.

Experimental Observations and Flow Measurements Using PIV of Pool Boiling with Nanofluids, E. E. Dominguez-Ontiveros, S. D. Fortenberry, C. E. Estrada-Perez, R. B. Barner, S. Abdel-Fattah, Y. A. Hassan (Texas A&M)

8:55 a.m.

Time Resolved Particle Image Velocimetry Measurements Inside a Packed Bed Reactor, E. E. Dominguez-Ontiveros, C. E. Estrada-Perez, R. B. Barner, J. Senellart, S. Abdel-Fattah, Y. A. Hassan (Texas A&M)

9:20 a.m.

Integral Test and Analysis for DVI-Line Break SBLOCA with SNUF, B. U. Bae, K. H. Lee, G. C. Park (Seoul Natl Univ)

Technical Sessions by Day (Tuesday)

9:45 a.m.

Analysis of Melt Pool Heat Transfer in a BWR Lower Head, C. T. Tran, T. N. Dinh (*Royal Inst of Technol*)

10:10 a.m.

Potential to Condensation Induced Water Hammer in Containment Fan Cooler, Young S. Bang, Kwang W. Seul, Ingoo Kim, Sweng W. Woo (*KINS*)

10:35 a.m.

Experimental Study of PCCS Condenser in Complete Condensation Mode, Shripad T. Revankar, Haijing Gao, Seungmin Oh (*Purdue Univ*)

11:00 a.m.

Advanced Reactor Passive Emergency Core Cooling System Stratified Flow Experiments and Characterization of Condensation Induced Water Hammer, Hiral J. Kadakia, Brian Williams, William Phoenix (*Idaho State Univ*), Richard S. Schultz (*INL*)

Closed Fuel Cycle Deployment in Fuel Cycle States: Similarities and Differences-Panel, sponsored by FCWMD. *Session Organizers:* Emory Collins (*ORNL*), James Laidler (*ANL*). *Chair:* Emory Collins [Track 1]

Nambe/Navajo

8:30 a.m.

Deployment of the closed fuel cycle in Fuel Cycle states has differed in timing and methods used. For example, short partitioning cycles (~10 years) are used in some states, and long periods may be more beneficial in others. These differences can lead to various performance results and different pathways and requirements for needed improvements. This panel will discuss similarities and differences.

PANELISTS:

- U.S. Plan (GNEP), James Laidler (*ANL*)
- French Plan, Phillipe Brossard (*CEA*)
- Japanese Plan, Kiyoto Aizawa (*JAEA*)
- United Kingdom Plan, Richard Taylor (*Nexia*)

Research Reactor Modeling, sponsored by RPD. *Session Organizer:* Tunc Aldemir (*Ohio State*). *Chair:* Tunc Aldemir [Track 6]

Picuris

8:30 a.m.

Combined Neutronics and Thermal Modeling of U6Nb Specimens in the ACRR, Keith E. Holbert (*Arizona State Univ*), Karen C. Kelley, Steven S. McCready, Francisco M. Guerra (*LANL*)

8:55 a.m.

Bootstrap Techniques Versus Full Core Model for Control Rod Calibration, K. Russell DePriest (*SNL*)

9:20 a.m.

Measurement of Gamma Dose at Power in the UWNRR, Christopher J. Staum, Paul P. H. Wilson, Michelle M. Blanchard (*Univ of Wisconsin, Madison*)

9:45 a.m.

Accounting for Core Burnup in Reactor Analysis of the University of Wisconsin Nuclear Reactor, Benjamin J. Schmitt, Paul P. H. Wilson (*Univ of Wisconsin, Madison*)

10:10 a.m.

An Experimental Benchmark of a Full Core Model of The Ohio State University Research Reactor, Ryanne Kennedy, Kyle Metzroth, Chad Cramer, Brent Shroy, Joseph Talnagi, Don W. Miller, Tunc Aldemir (*Ohio State*)

10:35 a.m.

Computation of the ORNL HFIR Reactor's Exposure-Dependent Eigenvalue Using MCNP-Based Core Depletion, Ned Xoubi, G. Ivan Maldonado (*Univ of Cincinnati*), R. T. Primm III (*ORNL*)

11:00 a.m.

Demonstration of a High Temperature Irradiation Capability in the MITR-II Research Reactor, G. E. Kohse, R. G. Ballinger, P. Hezjlar, M. S. Kazimi, Y. Ostrovsky, P. W. Stahle, Z. Xu (*MIT*)

Small-Scale Reactors for GNEP-Panel, sponsored by FCWMD. *Session Organizer:* Daniel Ingersoll (*ORNL*). *Cochairs:* Daniel Ingersoll, Ning Li (*LANL*) [Track 3]

Sandia

8:30 a.m.

The Global Nuclear Energy Partnership (GNEP) announced earlier this year seeks to provide the technologies needed to support a global expansion of nuclear energy for providing abundant, clear energy without a commensurate increase in the risk of nuclear proliferation. A key element of GNEP, and the one that has received most of the attention, is the development of proliferation-resistant technologies to "close" the nuclear fuel cycle and effectively manage nuclear fuel resources and waste products. Another key element of GNEP is the development and deployment of reactor designs that are well suited for developing countries, which have rapidly increasing energy demands but limited or no nuclear technology infrastructure. It is anticipated that these reactors will be significantly smaller than traditional commercial plants and will have features to support enhanced safety, simplified operations, and advanced safeguards. Proliferation risk will be addressed via a fuel assurance and take-back policy that will enable the country to benefit from nuclear energy without needing to invest in the more proliferation-prone aspects of the nuclear fuel cycle.

The global deployment of small-scale reactors within the GNEP context will generate many new challenges, including those related to technology, licensing, national and international policy, and economics. The purpose of this panel session is to highlight some of those issues and to encourage a broader community engagement in the development of small-scale reactors.

PANELISTS:

- Nuclear Energy's Role in Sustainable Development, David Wade (*ANL*)
- SMR Requirements and Technology Needs for GNEP, Daniel Ingersoll (*ORNL*)
- Nonproliferation Considerations for Global SMR Deployment, Jon Phillips (*PNNL*)
- Licensing Considerations and Issues for Global SMR Deployment, Don Williams (*ORNL*)
- Options for SMRs to Overcome Loss of Economies of Scale and Incorporate Increased Proliferation-Resistance and Security, Vladimir Kuznetsov (*IAEA*)

Nuclear Energy Technology for Regions with Water Scarcity-Panel, sponsored by ESD. *Session Organizers:* Per Peterson (*Univ of California, Berkeley*), Ken Schultz (*General Atomics*). *Chair:* Per Peterson [Track 8]

Santa Ana

8:30 a.m.

Many regions of the world, including California and the American Southwest, face growing problems with the scarcity of potable water. This panel session will explore the roles that nuclear energy technology can play in providing electricity, transport fuels, and desalination services in regions with water scarcity. Topics covered in the panel session will include approaches to electricity production with dry cooling, desalination technologies including advanced multieffect distillation, innovative uses of reclaimed water, and practical issues for advancing new technologies for these applications.

PANELISTS:

- Water Use Issues and DOE Water Programs, Tom Hinkebein (*SNL*)
- Water Use and Nuclear Power, Robin Newmark (*LLNL*)
- Advanced Multiple-Effect Distillation Processes for Nuclear Desalination, Per Peterson (*Univ of California, Berkeley*)
- Reduced Water Use and Dry Cooling with the GT-MHR, Puja Gupta (*General Atomics*)
- Reduced Water Use and Desalination with the PBMR, Willem Kriel (*Westinghouse*)
- The Option of Nuclear Desalination and Energy/Water Cogeneration in General, Ron Faibish (*ANL*)
- Water Use and Nuclear Expansion at Palo Verde, Robert Lotts (*Arizona Public Service*)

Technical Sessions by Day (Tuesday)

Nuclear Methods in Assessing Trace Element Status in Chronic Human Disease, sponsored by BMD; cosponsored by IRD. *Session Organizer:* J. Steven Morris (*Univ of Missouri, Columbia*). *Chair:* J. Steven Morris [Track 6]

Laguna

8:30 a.m.

Nuclear Analytical Methods in Health-Related Selenium Research, D. Behne, H. Bertelsmann, L. Dalla Puppa, D. Alber, A. Kyriakopoulos (*Hahn-Meitner-Institut*)

8:55 a.m.

The Impact of Methyl Mercury on the Distribution of Selenium in Various Tissues, J. D. Robertson, J. D. Brockman, N. C. Bodkin, K. M. Griswold (*Univ of Missouri, Columbia*), J. R. Kyger (*William Woods Univ*), L. J. Raymond, C. R. Ralston, N. V. C. Ralston (*Univ of North Dakota*)

9:20 a.m.

Trace Element Studies in Staple Foods for Children in Tanzania, Nicholas M. Spyrou, Najat K. Mohammed (*Univ of Surrey*)

9:45 a.m.

Effect of Selenium Supplementation and Chemical Form on Selenium Status, J. Steven Morris (*Univ of Missouri, Columbia*)

10:10 a.m.

Effects of Ionizing Radiation on Extracellular Matrix, F. Mohamed (*Univ of Exeter*), D. A. Bradley (*Univ of Surrey*), C. P. Winlove (*Univ of Exeter*)

10:35 a.m.

Monte Carlo Simulations for Boron Neutron Capture Therapy with Linacs, N. M. Spyrou, A. Alfuraih, A. Ma (*Univ of Surrey*)

11:00 a.m.

A Reflective Design of a Boron Neutron Capture Enhanced Fast Neutron Assembly, Zhonglu Wang, Nolan E. Hertel (*Georgia Tech*), Arlene Lennox (*Fermi Natl Accel Lab*)

Nuclear Materials Management and Nonproliferation, sponsored by FCWMD; cosponsored by Institute of Nuclear Materials Management. *Session Organizer:* Stephen V. Mladineo (*PNNL*). *Chair:* Lawrence J. Satkowiak (*ORNL*) [Track 3]

Santo Domingo

8:30 a.m.

Innovative Fuel Cycle for LWR-to-FR Shift Era with Nonproliferation, Junichi Yamashita, Tetsuo Fukasawa, Kuniyoshi Hoshino (*Hitachi*)

8:55 a.m.

The Thorium Cycle: An Assessment of Its Potentialities with a Focus on Nonproliferation Aspects, Dominique Grenèche (*AREVA NC*)

9:20 a.m.

On-Line Monitoring of Actinide Concentrations in Molten Salt Electrolyte, Curtis W. Johnson, Mary Lou Dunzik-Gougar (*Idaho State Univ*), Shelly X. Li (*INL*)

9:45 a.m.

Eliminating Weapons-Usable Materials, Kenji Murakami, Hans-Juergen Schreiber, Jorge Vallejo-Luna, Ivan Hladik (*IAEA*), Yevgeniy Yasko (*Ulba Metallurgical Plant*), James Lemley (*BNL*)

10:10 a.m.

Modeling Fission Product Adsorption by Zeolite 4A in a Molten Salt, Philip Tufts, Mary Lou Dunzik-Gougar (*Idaho State Univ*), Michael F. Simpson, Supathorn Phongikaroon (*INL*)

Project Status on Decommissioning and Reutilization-Papers/Panel, sponsored by DDRD. *Cochairs:* W. Randall Ridgway (*AECL*), Joseph E. Carrigan (*TLG Services*). [Track 3]

Apache

PAPERS

8:30 a.m.

Fast Track Characterization of Highly Radioactive Waste Pits Combining Off-the-Shelf Robotics with Innovative Investigation Protocols, Jean-Michel Chabeuf, Didier Boya, Samuel Courteille (*AREVA NC*)

8:55 a.m.

Review of Reuse/Recycling of Nuclear Power Plant Decommissioning Site, H.S. Kim, H.Y. Yang (*Korea Hydro & Nuclear Power*)

9:20 a.m.

Activation Calculations for the Winfrith Steam Generating Heavy Water Reactor, Nolan E. Hertel, Dwayne P. Blaylock, Eric A. Burgett (*Georgia Tech*)

9:45 a.m.

PANEL DISCUSSION

In the early 1990s the nuclear power industry experienced a number of plant shutdowns related primarily to economic conditions. Many of these facilities such as Yankee Rowe, Trojan, Big Rock Point, Maine Yankee, and Connecticut Yankee selected immediate dismantlement as their decommissioning alternative. Those plants are nearing the completion of their decommissioning efforts and face an unknown number of years of stewardship of spent nuclear fuel. This panel session will explore the current status of decommissioning in research, U.S. Department of Energy, and utility facilities.

PANELISTS:

- W. Randall Ridgway (*AECL*)
- James Byrne (*Byrne and Assoc*)
- Edward C. Doubleday (*EnergySolutions*)

TUESDAY, NOVEMBER 14, 2006 • 1:00 P.M.

Numerical Methods for Radiation Transport in High Energy Density Applications, sponsored by MCD. *Session Organizers:* Todd Urbatsch (*LANL*), Jeffery D. Densmore (*LANL*). *Chair:* Todd Urbatsch [Track 8]

Acoma

1:00 p.m.

A Hybrid Monte Carlo-Deterministic Method for Global, Time-Dependent Transport Calculations, Allan B. Wollaber, Edward W. Larsen (*Univ of Michigan*), invited

1:25 p.m.

Implicit Monte Carlo Methods for Three-Temperature Transport, Thomas M. Evans, Jeffery D. Densmore (*LANL*), invited

1:50 p.m.

The Difference Formulation of Radiation Transport in Implicit Monte Carlo, N. A. Gentile (*LLNL*), invited

2:15 p.m.

A Lumped Bilinear-Discontinuous S_N Spatial Discretization for R-Z Quadrilateral Meshes, J. E. Morel (*Texas A&M*), J. S. Warsa (*LANL*), invited

2:40 p.m.

Development of a Grey Nonlinear Thermal Radiation Diffusion Verification Problem, Thomas A. Brunner (*SNL*), invited

3:05 p.m.

An Upwind Spherical Harmonics Method for Thermal Radiation Transfer, Ryan G. McClarren, James Paul Holloway (*Univ of Michigan*), Thomas A. Brunner (*SNL*)

3:30 p.m.

Numerical Solution Algorithms for a P_{N-1} -Equivalent S_N Angular Discretization of the Transport Equation in One-Dimensional Spherical Geometry, J. S. Warsa (*LANL*), J. E. Morel (*Texas A&M*), invited

Technical Sessions by Day (Tuesday)

Best of RPSD 2006—II, sponsored by RPSD. *Session Organizer:* Robert B. Hayes (Bechtel Nevada). *Chair:* Robert B. Hayes [Track 7]

Zuni

1:00 p.m.

Computational Medical Physics: What Roles Can Nuclear Engineers Play?, X. George Xu (RPI)

1:25 p.m.

Investigation of Deterministic Simulation Parameters for a 3-D Radiotherapy C_{60} Device Model, A. Al-Basheer, M. Ghita, G. Sjoden (Univ of Florida)

1:50 p.m.

Mathematical Expressions for the Full-Energy Peak Efficiency of HPGe Detector with Rectangular Sources, M. I. Abbas (Alexandria Univ), S. S. Nafee (Alexandria Univ/NIST), L. R. Karam (NIST), Y. S. Selim (Alexandria Univ)

2:15 p.m.

A Method for Stochastic Noise Reduction by Chi-Squared Analysis, Eric Lavigne, Glenn Sjoden, James Baciak (Univ of Florida)

Computational Resources for Radiation Protection and Shielding—I

, sponsored by RPSD. *Session Organizer:* John S. Hendricks (LANL). *Chair:* Tim Goorley (LANL) [Track 7]

Zuni

2:45 p.m.

Capabilities of Attila for Radiation Protection and Shielding, Todd Wareing, John McGhee, Allen Barnett, Greg Failla, Ian Davis (Transpire)

3:10 p.m.

TRIPOLI-4: A 3D Continuous-Energy Monte Carlo Transport Code, C. M. Diop, O. Petit, E. Dumonteil, F. X. Hugot, Y. K. Lee, A. Mazzolo, J. C. Trama (CEA Saclay)

3:35 p.m.

A Monte Carlo Neutron/Photon Transport Code MVP Version 2, Yasunobu Nagaya, Keisuke Okumura, Takamasa Mori (JAEA)

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

Homeland Security Technologies—II: Consequence Management

, sponsored by RPSD. *Session Organizers:* Raymond Klann (ANL), Timothy B. Brown (SRNL). *Chair:* Timothy B. Brown [Track 1]

Tesuque

1:00 p.m.

Prevention, Mitigation, and Recovery of a Radiological Dispersion Device in an Urban Outdoor Sporting Venue, Jason M. Hollern, Brian K. Hajek, Jeffrey Lewis (Ohio State)

1:25 p.m.

MCNP Comparison with Point Source Measurements from a Portable HPGe System, Robert B. Hayes (Bechtel Nevada)

1:50 p.m.

Handheld Gamma-Ray Spectrometry for Assaying Radioactive Materials in Lungs, Jesson Hutchinson, Nolan E. Hertel, Ryan Lorio (Georgia Tech)

2:15 p.m.

Homeland Security Testing of the Self-Indicating Instant Radiation Alert Dosimeter (SIRAD), Gladys Klemic, Matthew Monetti, Paul Bailey (U.S. Dept. of Homeland Security), Howard Hall (LLNL)

2:40 p.m.

Can an UltraRadic Assess Internal Dose After an RDD?, Christina LoBracco, Nolan Hertel (Georgia Tech)

3:05 p.m.

Estimating the Dose to Emergency Room Personnel in an Event of an RDD, Ashby H. Bridges, Nolan E. Hertel (Georgia Tech)

Transitioning to Performance-Based Fire Protection (NFPA 805)—Papers/Panel, sponsored by NISD. *Session Organizer:* Raymond Gallucci (NRC). *Chair:* Paul Lain (NRC) [Track 4]

Cochiti

PAPERS

1:00 p.m.

Risk-Informed/Performance-Based Fire Protection for Nuclear Power Plants, Paul W. Lain (NRC)

1:25 p.m.

Regulatory Guidance for Performance-Based Fire Protection Program for Existing Nuclear Power Plants, Robert F. Radlinski (NRC)

1:50 p.m.

NFPA 805 Pilot Plant Observations, Elizabeth A. Kleinsorg, Andrew R. Ratchford (Kleinsorg Grp)

2:15 p.m.

Lessons Learned During the Transition to an NFPA 805 Fire Protection Licensing Basis, Robert Kalantari (EPM)

PANEL DISCUSSION

2:40 p.m.

PANELISTS:

- Paul W. Lain (NRC)
- Raymond Gallucci (NRC)
- Elizabeth Kleinsorg (Kleinsorg Grp)
- Robert Kalantari (EPM)

Severe Accident Phenomena and Engineered Features, sponsored by THD; cosponsored by NISD. *Session Organizers:* Joy Rempe (INL), Karen Vierow (Texas A&M), Kune Suh (Seoul Natl Univ). *Cochairs:* Joy Rempe, Karen Vierow [Track 7]

Taos

1:00 p.m.

Treatment of Uncertainties in Modeling Hydrogen Burning in the Containment During Severe Accidents, Aram Hakobyan, Richard Denning, Tunc Aldemir (Ohio State), Sean Dunagan, David Kunsman (SNL)

1:25 p.m.

RETRAN-3D Simulation/Evaluation of Oconee Unit 3 Reactor Trip Event, Gregory J. Byers, Robert Q. Huynh, Randy A. Hight (Duke Energy)

1:50 p.m.

Technical Basis and Analytical Methods Development Supporting the U.S. EPR Severe Accident Mitigation Features, Robert P. Martin, Manfred Fischer, Stephen M. Mazurkiewicz, Eric S. Williams (AREVA NP)

2:15 p.m.

In-Vessel Retention Enhancement Through the Use of Nanofluids, R. Hannink, J. Buongiorno, L. W. Hu (MIT)

2:40 p.m.

Long-Term Station Blackout Sequence and Mitigation MELCOR Model, Matthew W. Francis (Univ of Tennessee), Robert L. Sanders (ORNL), Mario Fontana (Univ of Tennessee)

3:05 p.m.

Natural Convection Heat Transfer in an Internally Heated Hemispherical Pool, Yong H. Yu, Kune Y. Suh (Seoul Natl Univ)

4:00 p.m. - 5:00 p.m.

THD AWARD CEREMONY

Data, Analysis, and Operations for Nuclear Criticality Safety—I, sponsored by NCSD. *Session Organizer:* Lane Paschal (Paschal Sol). *Chair:* Larry L. Wetzel (BWXT) [Track 4]

Nambe/Navajo

Technical Sessions by Day (Tuesday)

1:00 p.m.

Ten Years of Fast Reactor Spent Fuel Processing: Criticality Safety, Chad Pope, Eric Papaioannou (*INL*)

1:25 p.m.

Survey of Operating Parameters for Use in Burnup Credit Calculations, Susan N. Williams (*ORNL*), Donald E. Mueller (*ORNL*)

1:50 p.m.

Criticality Analysis of Storage Racks in a PWR Spent Fuel Pool, Vefa N. Kucukboyaci, Michael G. Anness (*Westinghouse*)

2:15 p.m.

Recent Developments with Slow Fissile Liquor Leak Criticality Hazards in Reprocessing Plants, Susanna Farnell, David McCrindle (*British Nucl Grp*)

2:40 p.m.

Postclosure Near Field Criticality Potential of Waste Packages Containing Commercial SNF, Charlotta E. Sanders, Susan L. LeStrange (*Bechtel SAIC*)

3:05 p.m.

Activity Towards Practical Application of Uranium-Dioxide Fuel Enriched to Greater than 5 wt% for Light Water Reactors, Ishi Mitsuhashi, Masahiko Kuroki (*Toshiba*), Shinya Kosaka (*Tepeco Systems Corp*), Yoshinori Miyoshi (*JAEA*), Seiji Shiroya (*Kyoto Univ*)

3:30 p.m.

Nuclear Criticality Safety Aspects of "Specified"-Uranium Fuel Cycle Facilities, H. Okuno, K. Suyama (*JAEA*), S. Takahashi (*Nucl Fuel Industries*), S. Watanabe (*Toshiba*), K. Tonoike, Y. Miyoshi (*JAEA*)

Reactor Analysis Methods, sponsored by RPD. *Chair*: Ron Ellis (*ORNL*) [Track 7]

Picuris

1:00 p.m.

Automatic Differentiation to Couple SCALE Modules Using GRESS 90—Part I: Methodology, James E. Horwedel (*ORNL*)

1:25 p.m.

Automatic Differentiation to Couple SCALE Modules Using GRESS 90—Part II: Application, Bradley T. Rearden, James E. Horwedel (*ORNL*)

1:50 p.m.

LWR Cross Section Libraries for ORIGEN-ARP in SCALE 5.1, Germina Ilas, Ian C. Gauld, Vince Jodoin (*ORNL*)

2:15 p.m.

COMET Solution in a Highly Heterogeneous Boiling Water Reactor Benchmark Problem, Benoit Forget, Farzad Rahnema (*Georgia Tech*)

2:40 p.m.

Application of the Krylov Subspace Method to Burnup Calculation for Lattice Physics Code, Akio Yamamoto (*Nagoya Univ*), Masahiro Tatsumi (*Nucl Fuel Industries*), Naoki Sugimura (*Nuclear Eng*)

3:05 p.m.

DORT-TD/THERMIX: A Time-Dependent Neutron Transport Theory Code Coupled with Thermal Hydraulics and Its Applications for the PBMR 268 MW Design, Bismark Tyobeka (*Penn State*), Andreas Pautz (*Erlangen*), Kostadin Ivanov (*Penn State*)

3:30 p.m.

Comparison of Monte Carlo Simulation Models for Randomly Distributed Particle Fuels in VHTR Fuel Elements, Hui Yu, Nam Zin Cho (*KAIST*)

Combined Operating License Application Status in the United States—Panel, sponsored by OPD. *Cochairs*: Kyle Turner (*McCallum-Turner*), Edward (Ted) Quinn (*Consultant*) [Track 2]

Sandia

1:00 p.m.

This session will focus on the current issues in the applications for the Combined Operating Licenses for upcoming new nuclear units in the United States. Panelists will address the utility, regulatory, U.S. Department of Energy, and vendor perspectives, roles, and responsibilities as well as the major challenges in completing this task prior to actual construction.

PANELISTS:

- Rebecca Smith-Kevern (*DOE*)
- Eugene Grecheck (*Dominion Eng*)
- Kenneth Hughey (*Energy*)
- John Price (*Constellation*)
- Steve Routh (*Bechtel*)
- Bill Borchart (*NRC*)
- Tom Mulford (*EPRI*)
- Ann Bisconti (*Bisconti Research*)

Use of Nuclear Energy for Hydrogen Production, sponsored by ESD. *Session Organizer*: Ken Schultz (*General Atomics*). *Chair*: Steve Herring (*INL*) [Track 8]

Santa Ana

1:00 p.m.

Feasibility Study of Hydrogen Production at Existing Nuclear Power Plants, Michael R. Anderson (*DOE*)

1:25 p.m.

Design and Cost Estimate for a First-of-a-Kind Commercial Prototype Nuclear Hydrogen Production Plant, William Summers, Edward Danko, Mel Buckner, Max Gorensek (*SRNL*)

1:50 p.m.

MELCOR-H2: A Modular, Generalized Tool for the Dynamic Simulation and Design of Fully-Coupled Nuclear Reactor/Hydrogen Production Plants, Sal B. Rodriguez, Randall O. Gauntt, Randy Cole, Katherine McFadden, Fred Gelbard, Len Malczynski, Billy Martin (*SNL*), Shripad T. Revankar, Karen Vierow (*Purdue Univ*), Dave Louie, Louis Archuleta (*Omicron*), Mohamed El-Genk, Jean-Michel Tournier (*Univ of New Mexico*)

2:15 p.m.

Analysis of System and Economics for Hydrogen Production by HTES Coupling with HTGR, Jung Hyun Lee, Hee Cheon No, Eung Soo Kim (*KAIST*)

2:40 p.m.

Synergistic Configuration of a GFR for Hydrogen Production by Steam Electrolysis, M. J. Memmott, M. J. Driscoll, P. Hejzlar (*MIT*)

3:05 p.m.

Concentration and Decomposition of Hydrogen Iodide in the IS Process, H. J. Yoon, H. C. No, S. J. Kim, B. J. Lee, E. S. Kim (*KAIST*)

3:30 p.m.

Transient Model for SI Cycle Hydrogen Generating Plant Coupled to High Temperature Gas Cooled Reactor, Seungmin Oh, Nicholas Brown, Shripad T. Revankar, Karen Vierow (*Purdue Univ*), Salvador Rodriguez, Randall Cole, Jr., Randall Gauntt (*SNL*)

Isotopes and Radiation: General, sponsored by IRD. *Chair*: Lav Tandon (*LANL*) [Track 6]

Laguna

1:00 p.m.

IsoChain: A User-Friendly, Two-Group Nuclear Transmutation and Decay Code, Christian L. J. Almanza (*Texas A&M*), Henry A. Lovett (*Univ of South Carolina*), Frank Schmittroth (*Consultant*), Marc A. Garland, Saed Mirzadeh (*ORNL*)

1:25 p.m.

Comparison of Performances of MCNP and EGSnrc for Modelling the Doses Imparted from Photons and e's to Samples, Eric V. Steinfelds (*Medical College of Wisconsin/Univ of Missouri, Columbia*), Mark A. Prelas (*Univ of Missouri, Columbia*)

Technical Sessions by Day (Tuesday)

1:50 p.m.

Preliminary Analysis of VHTR Decay Heat Source, Gokhan Yesilyurt, William R. Martin, John C. Lee (*Univ of Michigan*)

2:15 p.m.

Structure and Reaction Data of Neutron-Rich N-20 Nuclei from Fragmentation, E. Rodriguez-Vieitez (*LBNL/Univ of California, Berkeley*), P. Fallon (*LBNL*), D. Bazin, C. M. Campbell (*Michigan State Univ*), R. M. Clark (*LBNL*), J. M. Cook (*Michigan State Univ*), M. Cromaz, M. A. Deleplanque (*LBNL*), D.-C. Dinca, A. Gade, T. Glasmacher (*Michigan State Univ*), I. Y. Lee, A. O. Macchiavelli (*LBNL*), W. F. Mueller (*Michigan State Univ*), S. G. Prussin (*Univ of California, Berkeley*), F. S. Stephens, M. Wiedeking (*LBNL*), K. Yoneda (*Michigan State Univ*)

2:40 p.m.

Recent Advances in Pyroelectric Radiation Generation, Jeffrey Geuther, Yaron Danon, Kamron Fazel (*RPI*)

3:05 p.m.

Actinium-225 for Alpha Particle Radioimmunotherapy, Rose A. Boll (*ORNL*), Saed Mirzadeh (*ORNL*)

The Waste Isolation Pilot Plant: An Operating Repository, sponsored by FCWMD. *Session Organizers:* Thomas J. Hirons (*LANL*), Ruth Weiner (*SNL*). *Chair:* Thomas J. Hirons [Track 3]

Santo Domingo

1:00 p.m.

WIPP at Eight Years—Success, Status and Plans, Dave Moody, Richard D. Raaz (*DOE*)

1:25 p.m.

Evolution of Technical Issues Associated with Developing and Operating WIPP, Thomas E. Kiess (*U.S. Dept. of Homeland Security*)

1:50 p.m.

The Road to WIPP's Second Recertification, R. L. Patterson (*DOE*), S. C. Kouba (*Washington Reg & Environ Svc*), D. S. Kessel (*SNL*), G. R. Kirkes (*John Hart & Assoc*)

2:15 p.m.

Reengineering TRU Waste Authorization Basis, Inés R. Triay, Dae Chung, Chuan-Fu Wu (*DOE*), Bill Keeley (*Washington TRU Sol*), Stephanie Jennings (*LANL*)

2:40 p.m.

Emplaced Waste Characteristics in WIPP, Roger Nelson (*DOE*)

3:05 p.m.

WIPP Waste Analysis Plan Improvements and Remote-Handled TRU Waste Permitting, Robert Kehrman, John Garcia, Sean White, Wayne Ledford (*Washington Reg & Environ Svc*)

3:30 p.m.

The Waste Isolation Pilot Plant Transportation System, A Regulatory Perspective, Phil Gregory, Angela Johnson (*Washington TRU Sol*), Casey Gadbury (*DOE*)

Focus on Communications—II: Pronuclear Communications—Papers/Panel, sponsored by ETD. *Session Organizer:* David Pointer (*ANL*). *Chair:* David Pointer [Track 9]

Apache

PAPERS

1:00 p.m.

Racing to Win the Public Communications Competition, D. E. Beller (*UNLV*), E. H. Wachs, P. L. Newman (*Newman Wachs Racing*), S. Kerrick (*ANS*)

1:25 p.m.

Unique NAVIS-Based Approach for Framing Dialog Regarding Nuclear Power Expansion, Jeffrey D. Brewer, Roger Cox, Carmen Mendez (*SNL*)

PANEL DISCUSSION

1:50 p.m.

The electric power industry is beginning to consider the construction and operation of a new generation of nuclear power plants to ensure continuity of power supplies and to provide for the growing energy needs of the United States. The public debate over the safety and viability of nuclear energy is rapidly returning to a position of high visibility to the public. In most cases the arguments being leveled against new nuclear generation capacity have not significantly changed since the peak of U.S. construction several decades ago. However, the supporters of new nuclear power are taking a more active role in communicating the benefits of nuclear with the media, the policy makers, and the public. This session will highlight current activities of pronuclear activists throughout the nation and the industry, including the establishment of local support groups, coordination of grassroots campaigns, and the use of the World Wide Web as a communication medium.

PANELISTS:

- Denis Beller (*UNLV*)
- Jeffrey Brewer (*SNL*)
- Michael Stuart (*Dominion Eng [representing NA-YGN]*)
- Lisa Shell (*NEI [representing CASEnergy Coalition and EnAct]*)
- Jim Walther (*National Atomic Museum*)

Focus on Communications—III: What Can We Learn from the Students?—Panel, sponsored by ETD. *Session Organizer:* Mary Lou Duznik-Gougar (*Idaho State Univ*). *Chair:* Mary Lou Duznik-Gougar [Track 9]

Apache

2:20 p.m.

This session will showcase some of the many successful, innovative, and creative outreach efforts by American Nuclear Society student sections at universities across the United States. Much can be learned from students' discussion of K-12 school visits, Boy Scout and Girl Scout workshops, essay contests, letters to the editor, Earth Day activities, proactive attendance at public hearings and rallies, participation at Science Fairs and Career Fairs, etc.

PANELISTS:

Representatives of ANS Student Chapters at the following:

- Oregon State University
- Texas A&M University
- University of Wisconsin, Madison
- University of Michigan
- The Ohio State University
- University of Missouri, Rolla

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

General Chair's Special Session: Nonproliferation and Security.

Cochairs: Michael R. Anastasio (*LANL*), Thomas G. Hunter (*SNL*) [Track 1]

Ballroom C

4:00 p.m.

Welcome and Remarks

REMARKS – Susan Eisenhower (*President, Eisenhower Group, Inc.*)

REMARKS – Laura Schmidt-Williams (*Deputy Director, International Science and Technology Center, Moscow, Russia*)

REMARKS – Jerry Paul (*Principal Deputy Administrator, National Nuclear Security Administration*)

REMARKS – Scott Campbell (*President, American Council on Global Nuclear Competitiveness*)

REMARKS – Representative (*Arms Control and International Security, U.S. State Department*)

Q&A and Closing

Technical Sessions by Day (Wednesday)

WEDNESDAY • NOVEMBER 15, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
8:30 AM - 11:30 AM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
8:30 AM - 11:30 AM	2006 ANS WINTER MEETING TECHNICAL SESSIONS
	<ul style="list-style-type: none">• Transport Methods: General—II• Radiation Protection & Shielding: General—II• Burnup/Depletion Modeling: Capabilities & Results• Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance & Analysis• General Thermal Hydraulics—II• Data, Analysis, & Operations for Nuclear Criticality Safety—II• Reactor Physics Design, Validation, & Operating Experience• Advanced Nuclear Energy Systems Including Nuclear Power 2010: Research & Development• Current Risk Issues in Environmental Cleanup—Panel• Nuclear Nonproliferation & International Safeguards Measurement Technologies—II• Recent Developments in Fuel Cycle Modeling & Systems Analysis—II• Innovations in Nuclear Engineering Education, Training, & Distance Education
11:30 AM - 1:00 PM	MATERIALS SCIENCE AND TECHNOLOGY (MSTD) AWARDS LUNCHEON
1:00 PM - 4:00 PM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
1:00 PM - 4:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS
	<ul style="list-style-type: none">• Transport Methods: General—III• Mathematical Modeling: General• Critical Technologies for Space Reactor Development• Novel Fuel Concepts for Advanced Reactor Systems• Codes for Radiation Shielding & Accelerator Applications• Probabilistic Risk Assessment• Thermal Hydraulics of Advanced Systems• Use of Hand Calculations in Nuclear Criticality Safety Analyses—Panel• Reactor Physics: General• University Reactor & Nuclear Research—I—Panel• Contributions of Nuclear Science & Technology to Sustainable Development• Nuclear Nonproliferation & International Safeguards Measurement Technologies—II• Development of Conversion Processes & Remote Fuel Fabrication Capabilities for Transmutation Fuels• Nuclear Methods in Support of Nano- to Micro-Domain Sciences• Biology & Medicine: General
1:00 PM - 5:00 PM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
4:30 PM - 6:30 PM	NPIC&HMIT 2006 SPECIAL SESSION: "GNEP — I&C Issues—Panel"
6:50 PM - 10:00 PM	EVENING EVENT: Dinner at El Pinto Restaurant
7:00 PM - 9:00 PM	PUBLIC INFORMATION WORKSHOP: "Focus on Communications: Speaking to the Media"

WEDNESDAY, NOVEMBER 15, 2006 • 8:30 A.M.

Transport Methods: General—II, sponsored by MCD. *Session Organizer:* Dmitriy Y. Anistratov (NCSU). *Chair:* Edward W. Larsen (Univ of Michigan) [Track 7]

Acoma

8:30 a.m.

Time-Absorption Eigenvalue Searches Using Diffusion Synthetic Acceleration, Jon A. Dahl, Raymond E. Alcouffe (LANL)

8:55 a.m.

Stability Analysis of the Quasidiffusion Method for 1D Periodic Heterogeneous Problems, Adrian Constantinescu, Dmitriy Y. Anistratov (NCSU)

9:20 a.m.

Tailored Spherical Harmonics for Coupled Lattice Whole-Core Variational Nodal Transport Calculations, E. E. Lewis (Northwestern Univ), M. A. Smith, G. Palmiotti (ANL)

9:45 a.m.

A Transport Discretization Method for Spatial Cells with Material Interfaces, Randal S. Baker (LANL), Edward W. Larsen (Univ of Michigan)

10:10 a.m.

Transport Error Estimates for Adaptive Refinement of Spatial Grids, Michael S. Reed, Marvin L. Adams, Jim E. Morel (Texas A&M)

10:35 a.m.

Improvement of the Flat Source Approximation in the Method of Characteristics, Akio Yamamoto (Nagoya Univ)

11:00 a.m.

Coarse Mesh Projection Method for Calculation of Dominance Ratio, Brian R. Nease, Taru Ueki (Univ of New Mexico)

Radiation Protection and Shielding: General—II, sponsored by RPSD.

Session Organizer: John S. Hendricks (LANL). *Chair:* Bernadette L. Kirk (ORNL) [Track 7]

Zuni

8:30 a.m.

New Medical Physics Features for MCNP, A. Lazarine, J. Carter, T. Goorley (LANL)

8:55 a.m.

Measured and Simulated Organ Doses for IMRT and 3DCRT, X. George Xu, Bryan Bednarz (RPI), Brian Wang (Cooper Univ Hospital)

9:20 a.m.

An Uncertainty Assessment with MCNP for the Coordinated Network for Radiation Dosimetry Code Intercomparison, J. Carter, A. Lazarine, T. Goorley (LANL)

9:45 a.m.

Converging a 9TVL Monte Carlo Model with Deterministically Generated Weight Windows, Andrew D. Hodgdon, Glen D. Seeburger (AREVA NP), Ian M. Davis (Transpire)

10:10 a.m.

Neutron Spectral Fluence Rate Measurement at NC State University PULSTAR Research Reactor, Zhonglu Wang, Nolan E. Hertel, Eric Burgett, Dwayne Blaylock (Georgia Tech)

Burnup/Depletion Modeling: Capabilities and Results, sponsored by

RPSD; cosponsored by RPD, NCSU. *Session Organizer:* Jennifer Manneschildt (ORNL). *Chair:* John Wagner (ORNL) [Track 4]

Tesque

8:30 a.m.

Current Methods of Depletion Analysis, Michael L. Fensin (LANL/Univ of Florida), Samim Anghaie (Univ of Florida)

8:55 a.m.

Burn-Up Modelling Capabilities in ALEPH, Wim Haecck, Bernard Verboomen (SCK/CEN)

9:20 a.m.

A New Source Initialization Capability for the SCALE Burnup Credit Sequence, Michael T. Wenner (Univ of Florida), John C. Wagner, Lester M. Petrie (ORNL)

9:45 a.m.

Implementation and Verification of AMALGAMATE, An Interfacing Tool for TORTSQ and ORIGEN-S, J. J. Klingensmith, Y. Y. Azmy (Penn State), I. C. Gauld (ORNL)

10:10 a.m.

Modification of MonteBurns to Maintain Criticality Throughout the Burnup Cycle, Holly R. Trelue (LANL)

10:35 a.m.

Incorporation of a Predictor-Corrector Methodology and 1-Group Reaction Rate Reporting Scheme for the MCNPX Depletion Capability, Michael L. Fensin (LANL/Univ of Florida), John S. Hendricks, Holly Trelue (LANL), Samim Anghaie (Univ of Florida)

Generic Safety Issue 191: Pressurized Water Reactor Containment Sump Performance and Analysis, sponsored by NISD; cosponsored by OPD.

Session Organizer: Dana A. Powers (SNL). *Chair:* Michael L. Scott (NRC) [Track 4]

Cochiti

8:30 a.m.

Regulatory Perspective and Path Forward on Generic Safety Issue 191, Michael L. Scott (NRC)

8:55 a.m.

Transportability of Coatings Debris in Containment Sump Pool, Ervin Geiger (NRC)

9:20 a.m.

Integrated Chemical Effects Test Project, Bhagwat P. Jain (NRC)

9:45 a.m.

Chemical Effects Head Loss Testing Program, J. H. Park, K. E. Kasza, B. Fisher, K. N. Natesan, W. J. Shack (ANL) [to be presented by Bhagwat P. Jain (NRC)]

Technical Sessions by Day (Wednesday)

10:10 a.m.

Chemical Speciation Prediction, Bhagwat P. Jain (NRC)

10:35 a.m.

Experimental Measurements of Pressure Drop Across Debris Beds on PWR Sump Screens in Support of Generic Safety Issue 191, Carl W. Enderlin, Beric E. Wells (PNNL)

11:00 a.m.

Calculation of Pressure Drop Across a Porous Media Debris Bed on a PWR Sump Screen, William J. Krotiuk (NRC)

General Thermal Hydraulics—II, sponsored by THD. *Cochairs:* Fan-Bill Cheung (Penn State), Thomas Larson (INL) [Track 7]

Taos

8:30 a.m.

Assessment of the TRACE Code Against Rod Bundle Heat Transfer Transient Uncovery Data, Kent B. Welter, Joseph M. Kelly, Stephen M. Bajorek (NRC)

8:55 a.m.

Spacer Grid Measurements During Dispersed Flow Film Boiling in Rod Bundles, L. E. Hochreiter, S. Ergun, F-B Cheung, T. F. Lin (Penn State), G. S. Rhee, S. M. Bajorek, J. M. Kelly (NRC)

9:20 a.m.

A New Correlation for the Turbulent Mixing Rate in Rod Arrays, Hae-Yong Jeong, Kwi-Seok Ha, Yong-Bum Lee, Dohee Hahn (KAERI)

9:45 a.m.

RELAP5 Performance in Predicting Critical Power in a BWR Fuel Bundle, Francesco Cadinu, Tomasz Kozlowski, Truc-Nam Dinh (Royal Institute Technol)

10:10 a.m.

Assessment of RELAP5/MOD3.3 Condensation Model for the PCCS in ESBWR, Shripad T. Revankar, Haijing Gao, Seungmin Oh (Purdue Univ)

10:35 a.m.

Need of a Coherent and Consistent Phenomena Identification and Ranking Table (PIRT) to Address Small, Intermediate, and Large Break LOCA in PWRs, Cesare Frepoli (Westinghouse)

Data, Analysis, and Operations for Nuclear Criticality Safety—II, sponsored by NCS. *Session Organizer:* Lane Paschal (Paschal Sol). *Chair:* Lane Paschal [Track 4]

Nambe/Navajo

8:30 a.m.

New Capabilities to Calculate Volumes of SCALE/KENO-VI Geometry Models, James E. Horwedel, Stephen M. Bowman, Daniel F. Hollenbach (ORNL)

8:55 a.m.

Processing of ENDF/B-VII Covariance Data for Use with Sensitivity/Uncertainty Analysis, D. Wiarda, M. E. Dunn, N. M. Larson, L. C. Leal (ORNL)

9:20 a.m.

Multigroup Cross Section and Cross Section Covariance Data Visualization with Javapeño, Aaron M. Fleckenstein (ORISE), Bradley T. Rearden (ORNL)

9:45 a.m.

Advances in the KENO-VI Geometry Package, D. F. Hollenbach, L. M. Petric, S. M. Bowman (ORNL)

10:10 a.m.

Early Integration of Criticality Safety into Fissile Processing Facility Design, Barbara Krögfuss (BWXT Y-12)

10:35 a.m.

Critical Mass of ²³⁵U Systems with Varied Moderator and Reflector Materials, Steven Felipe Saavedra, Robert Douglas Busch (Univ of New Mexico)

Reactor Physics Design, Validation, and Operating Experience, sponsored by RPD. *Chair:* Michael D. Heibel (Westinghouse) [Track 7]

Picuris

8:30 a.m.

Plant Outage Time Savings Provided by Subcritical Physics Testing at Diablo Canyon Unit 2, Kenneth Kargol (PG&E), M. D. Heibel (Westinghouse)

8:55 a.m.

A Deterministic and Statistical Analysis of a PCMI Fuel Failure, M. R. Young, L. E. Hochreiter (Penn State)

9:20 a.m.

A Feasibility Study to Estimate the Subcriticality at a PWR Startup, Eun-Ki Lee, Ho Chul Shin, Sung-Man Bae, Yong-Kwan Lee (KEPRI)

9:45 a.m.

Simulation of ZPR-6 Assembly 7 with MCNP5, Athi Varuttamaseni, John C. Lee (Univ of Michigan)

10:10 a.m.

Confirmation of Neutron Production During Self-Nucleated Acoustic Cavitation, Edward R. Forringer, David Robbins, Jonathan Martin (LeTourneau Univ)

Advanced Nuclear Energy Systems Including Nuclear Power 2010: Research and Development, sponsored by OPD. *Chair:* Carter D. Savage (DOE) [Track 2]

Sandia

8:30 a.m.

EPR: An Evolutionary Step to the United States Nuclear Fleet, Stephen Mazurkiewicz, Calvin Ritchey, Kevin Baucom, Eric Williams (Areva NP)

8:55 a.m.

Thermal Analysis of a Gas Cooled Fast Transmutation Reactor, P. B. Johnson, C. J. Fong, J. S. Wagner, R. P. Manger, C. Mitra, W. M. Stacey (Georgia Tech)

9:20 a.m.

Direct Energy Conversion Using He Ion Beams in Support of the Fission Fragment Magnetic Collimator Reactor Experiment, Jesse Carter, Celestino Abrego, Avery Guild-Bingham, Lucas Phinney, Ron Hart, Pavel Tsvetkov (Texas A&M), Don B. King, Gary Rochau (SNL)

9:45 a.m.

Fracture Toughness of IG-11 Graphite with Crack Size Measurement Methods, Daejong Kim, Changheui Jang (KAIST), Se-Hwan Chi (KAERI)

10:10 a.m.

Inert Gas Effects in Ferritic-Martensitic SCWR Steel Cladding, Samuel J. Zenobia, Gerald L. Kulcinski, Gregory R. Piefer, Robert P. Ashley (Univ of Wisconsin, Madison)

10:35 a.m.

The High Temperature Oxidation Behaviors of Several Nickel Base Superalloys, Daejin Lee (KAIST), Sanggyu Lee (KAIST/Kyoto University), Changheui Jang (KAIST)

Current Risk Issues in Environmental Cleanup—Panel, sponsored by ESD. *Session Organizer:* S. Y. Chen (ANL). *Chair:* S. Y. Chen [Track 5]

Santa Ana

8:30 a.m.

A recent trend in establishing regulatory policy regarding environmental cleanup has been the risk-informed decision approach. This approach places an emphasis on the development of a defensible technical basis and the regulatory processes by which cleanup decisions can be understood and accepted by stakeholders. The approach has been exemplified by the federal and state regulators who provide oversight over the many cleanup sites across the nation. The approach entails addressing the following three basic risk components: risk assessment, risk management, and risk communication. One major issue associated with risk assessment is regarding the potential uncertainties and understanding their ramifications to risk management (i.e., the decision-making process). Seeking clarity to this process through a very effective risk communication mechanism with stakeholders is essential to the decision makers. Identifying and resolving the potential issues is key to the success of the nation's environmental cleanup effort.

Technical Sessions by Day (Wednesday)

PANELISTS:

- Stephen Domotor (*DOE*)
- Stuart Walker (*EPA*)
- Phil Egidi (*Colorado Dept of Health*)
- Daniel Strom (*PNNL*)
- S. Y. Chen (*ANL*)

Nuclear Nonproliferation and International Safeguards Measurement Technologies—I, sponsored by IRD. *Session Organizers:* Stephen LaMont, Michael Miller (*LANL*). *Chair:* Michael Miller [Track 1]

Laguna

8:30 a.m.

Overview of Safeguards Approach for the BN-350 Dry Storage Facility, Michael C. Browne, Robert F. Parker, Peter A. Santi, Richard B. Williams (*LANL*)

8:55 a.m.

Attended Safeguards for the BN-350 Dry Storage Facility, Peter A. Santi, Michael C. Browne (*LANL*)

9:20 a.m.

Unattended Safeguards for the BN-350 Dry Storage Facility, Richard B. Williams, Michael C. Browne, Robert F. Parker (*LANL*)

9:45 a.m.

Detection of Cm-244 in Plutonium-Bearing Wastes at Reprocessing Facilities, D. H. Beddingfield, A. P. Belian (*LANL*)

10:10 a.m.

Curium Ratios for Measurement of Fissile Material, M. T. Swinhoe, H. O. Menlove (*LANL*)

10:35 a.m.

Materials Accountability in Next Generation Reprocessing Plants, B. B. Cipiti, P. E. Rexroth (*SNL*)

11:00 a.m.

Enhancing Nonproliferation Through Nuclear Fuel Cycle Transparency, David L. York, Gary Rochau, Carmen Mendez (*SNL*)

Recent Developments in Fuel Cycle Modeling and Systems Analysis—I, sponsored by FCWMD. *Session Organizer:* Mary Lou Dunzik-Gougar (*Idaho State Univ*). *Chair:* Mary Lou Dunzik-Gougar [Track 3]

Santo Domingo

8:30 a.m.

SINEMA: Simulation Institute for Nuclear Energy Modeling and Analyses, Kemal O. Pasamehmetoglu (*INL*), Phillip Finck (*ANL*)

8:55 a.m.

VISION: Verifiable Fuel Cycle Simulation Model, Jacob Jacobson (*INL*), A. M. Yacout (*ANL*), Gretchen Matthern, Steven Piet, David Shropshire, Chris Laws (*INL*)

9:20 a.m.

Potential Future Nuclear Fuel Cycles: Simulation, Evaluation, and Trade-Offs, Steven Piet, Gretchen Matthern (*INL*), Abdellatif Yacout (*ANL*), Jacob Jacobson, Chris Laws (*INL*)

9:45 a.m.

Transitioning to Global Optimization in Fuel Cycle System Study Tools, Rachna Jain, Paul P. H. Wilson (*Univ of Wisconsin, Madison*)

10:10 a.m.

Global Evaluation of Nuclear Infrastructure Utilization Scenarios: Initial Code Development, Christopher A. Juchau, Mary Lou Dunzik-Gougar (*Idaho State Univ*), Kemal Pasamehmetoglu (*INL*)

10:35 a.m.

Transuranics Recycling in Various Reactor/Fuel Cycle Systems, A. Aquien, M. S. Kazimi, P. Hejzlar (*MIT*)

Innovations in Nuclear Engineering Education, Training, and Distance Education, sponsored by ETD. *Session Organizer:* Brian Hajek (*Ohio State*). *Chair:* Richard Coe (*Columbia Tech Assoc*) [Track 9]

Apache

8:30 a.m.

Advancing a New Paradigm to Address Workforce Needs for Radiation Protection Associates Degree Education, Matthew A. Easter, Matthew M. Schmidt, Ioan G. Ionas, David H. Jonassen, William H. Miller, Rose M. Marra, Gayla M. Neumeyer (*Univ of Missouri, Columbia*)

8:55 a.m.

Using On-Line Quizzes in a Course Managed Instruction System to Encourage Student Review of Resource Materials, Brian K. Hajek, Ryan Winningham, Jason Hollern (*Ohio State*)

9:20 a.m.

Evaluation of the NRC's High Temperature Gas-Cooled Reactor Knowledge Management Pilot Program, Kent B. Welter, Donald E. Carlson, James E. Morris (*NRC*), Sydney Ball (*ORNL*)

9:45 a.m.

Development of a Problem-Based Introduction to Nuclear Science and Engineering to Increase Future Nuclear Workforce Diversity, Matthew M. Schmidt, Matthew A. Easter, Rose M. Marra, David H. Jonassen, Jiazhen Wang, William H. Miller, Gayla M. Neumeyer (*Univ of Missouri, Columbia*)

10:10 a.m.

Web-Casting of Nuclear Reactor Experiments, Prashant Jain, Stefano Markidis, Barclay G. Jones, Rizwan-uddin (*Univ of Illinois*), John R. White, Leo M. Bobek (*Univ of Massachusetts Lowell*)

10:35 a.m.

Deployment of a Web-Enabled Neutron Spectrometer, J. Maro, T. Lucas, L. W. Hu, J. Bernard (*MIT*)

11:00 a.m.

Prototype Computer Based Procedure Implementation at University of Missouri-Rolla Reactor, Shung Yu, William Bonzer, Shoaib Usman (*Univ of Missouri, Rolla*)

WEDNESDAY, NOVEMBER 15, 2006 • 1:00 P.M.

Transport Methods: General—III, sponsored by MCD. *Session Organizer:* Dmitriy Y. Anistratov (*NCSU*). *Chair:* Cassiano de Oliveira (*Georgia Tech*) [Track 7]

Acoma

1:00 p.m.

Canonical Form for the Strength of Coupling Between Neighboring Spatial Cells for WDD Transport Methods in Homogeneous Configurations in 2D Geometry, Massimiliano Rosa, Yousry Y. Azmy (*Penn State*), Jim E. Morel (*Texas A&M*)

1:25 p.m.

Goal-Oriented Error Control for Self-Adaptive Radiation Transport Calculations, HyeongKae Park, Cassiano R. E. de Oliveira (*Georgia Tech*)

1:50 p.m.

Some Benchmark Results on Criticality of a Sphere, S. Naz, S. K. Loyalka (*Univ of Missouri, Columbia*)

Mathematical Modeling: General, sponsored by MCD. *Session Organizer:* Dmitriy Y. Anistratov (*NCSU*). *Chair:* Rizwan-uddin (*Univ of Illinois*) [Track 7]

Acoma

2:20 p.m.

Extension of the Autoregressive Method for Autocorrelation Estimation of Monte Carlo Fission Sources, Brian R. Nease, Taro Ueki (*Univ of New Mexico*)

2:45 p.m.

Exact Solution of a Nonlinear, Time-Dependent, Infinite-Medium, Grey Radiative Transfer Problem, Scott W. Mosher (*LANL*)

Technical Sessions by Day (Wednesday)

3:10 p.m.

Effects of Modeling Assumptions on BWR Stability Results, Hitesh Bindra, Rizwan-uddin (*Univ of Illinois*)

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

Critical Technologies for Space Reactor Development, sponsored by ANST. *Chair:* Shannon Bragg-Sitton (*NASA, MSFC*) [Track 8]

Zuni

1:00 p.m.

Mass and Power Growth of Sected, Compact Space Reactor (SCoRe), Steven A. Hatton, Mohamed S. El-Genk (*Univ of New Mexico*)

1:25 p.m.

Thermal Simulator Development: Non-Nuclear Testing of Space Fission Systems, S. M. Bragg-Sitton, R. Dickens (*NASA, MSFC*)

1:50 p.m.

Preliminary Evaluation of Convective Heat Transfer in a Water Shield for a Surface Power Reactor, J. Boise Pearson (*NASA, MSFC*), Robert S. Reid (*LANL*)

Novel Fuel Concepts for Advanced Reactor Systems, sponsored by ANST; cosponsored by MSTD. *Chair:* Shannon Bragg-Sitton (*NASA, MSFC*) [Track 3]

Zuni

2:20 p.m.

Fabrication, Reprocessing, and Fuel Design for TRU TRISO Particles in a Gas-Cooled Fast Reactor, A. C. Bryson, J. Chandler, O. M. Chen, B. L. Meriwether, K. R. Riggs, C. M. Sommer, W. M. Stacey, D. W. Tedder, C. P. Wells (*Georgia Tech*)

2:45 p.m.

Experimental Studies on Behaviour and Properties of Nitride Fuels, V. V. Rondinella, A. Ciriello, D. Staicu, J.-P. Hiernaut, M. Walter (*JRC*)

3:10 p.m.

Fuel Cycle Analysis of a Subcritical, Gas-Cooled, Fast Transmutation Reactor, B. A. MacLaren, S. S. Chiu, S. P. Hamilton, C. M. Sommer, F. P. Willis, W. M. Stacey, C. de Oliveira (*Georgia Tech*)

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

Codes for Radiation Shielding and Accelerator Applications, sponsored by RPSD; cosponsored by AAD. *Session Organizer:* Denis E. Beller (*UNLV*). *Chair:* Laurie S. Waters (*LANL*) [Track 7]

Tesuque

1:00 p.m.

Outline of the EGS5 Code System, Y. Namito, H. Hirayama (*High Energy Accelerator Resh Org*), A. F. Bielajew, S. J. Wilderman (*Univ of Michigan*), W. R. Nelson (*Stanford Linac*)

1:25 p.m.

The Integrated TIGER Series Version 5.0, Thomas W. Laub, Ronald P. Kensek, Brian C. Franke, Leonard J. Lorence, Martin J. Crawford, Thomas J. Quirk (*SNL*)

1:50 p.m.

The Present Status of the PHITS Code, Koji Niita (*RIST*)

2:15 p.m.

Geant4—A Simulation Toolkit, Makoto Asai (*Stanford Linac*)

2:40 p.m.

Geant4 Physics, Dennis H. Wright (*Stanford Linac*)

Probabilistic Risk Assessment, sponsored by NISD. *Session Organizer:* Dana A. Powers (*SNL*). *Chair:* J. S. Hyslop (*NRC*) [Track 4]

Cochiti

1:00 p.m.

Probabilistic Design of a Passive System, Luciano Burgazzi (*ENEA*)

1:25 p.m.

Bounding the Fire Risk from Circuit Spurious Actuations at Nuclear Power Plants, Raymond H. V. Gallucci (*NRC*)

1:50 p.m.

Generating Dynamic Fault Trees from Markov Models, Paolo Bucci, Jason Kirschenbaum, Tunc Aldemir (*Ohio State*), Curtis Smith, Ted Wood (*INL*)

2:15 p.m.

A Study on a Careful Use of the Balancing Method for the Component RAW in Option 2, Kilyoo Kim, Joon-Eon Yang (*KAERI*)

2:40 p.m.

The Development of a PSA Information Management System, Seung Hwan Kim, Sang Hoon Han (*KAERI*)

3:05 p.m.

Analytical Evaluation of Surface Roughness Length at a Large DOE Site, Kevin R. O’Kula, David C. Thoman (*WSMS*)

3:30 p.m.

Good Alarm Design Plays a Vital Role in Successful DCS Implementation: Hard Learned Lessons from Petrochemical Applications, Chris Wilson, Doug Rothenberg (*TIPS*)

Thermal Hydraulics of Advanced Systems, sponsored by THD.

Session Organizers: Robert Martin (*AREVA*), Mohamed El-Genk (*Univ of New Mexico*), T. Larson (*INL*). *Cochairs:* Robert Martin, Mohamed El-Genk [Track 8]

Taos

1:00 p.m.

Effect of Pressure Drop in Brayton Cycle Efficiency Calculations, D. M. Legault, P. Hejzlar, M. J. Driscoll (*MIT*)

1:25 p.m.

Noble Gases Binary Mixtures for Brayton Commercial Nuclear Power Plants, Mohamed S. El-Genk, Jean-Michel Tournier (*Univ of New Mexico*)

1:50 p.m.

Addition of Secondary System Modules and a Graphical User Interface into MELCOR-H2—Phase 1, Sal B. Rodriguez, Randy Cole, Katherine McFadden, Randall O. Gauntt, Fred Gelbard, Len Malczynski, Billy Martin (*SNL*), Shripad T. Revankar, Karen Vierow (*Purdue Univ*), Dave Louie, Louis Archuleta (*Omicron*), Mohamed El-Genk, Jean-Michel Tournier (*Univ of New Mexico*)

2:15 p.m.

Supercritical Water Heat Transfer, Jeremy R. Licht, Mark H. Anderson (*Univ of Wisconsin, Madison*)

Use of Hand Calculations in Nuclear Criticality Safety Analyses—Panel, sponsored by NCSD. *Session Organizer:* Robert Busch (*Univ of New Mexico*).

Chair: Douglas Bowen (*LANL*) [Track 4]

Navabe/Navajo

1:00 p.m.

Many years ago before the advent of high-speed desktop computers, pioneers in the field of nuclear criticality safety, such as Joe Thomas, David Smith, and Hugh Paxton, took the time to create criticality safety hand methods for single fissile units or fissile units arranged into array configurations. However, much of the lore has been lost, and the information has been scattered among numerous documents. To centralize this information, a Primer has been developed for the most commonly used hand methods for criticality safety calculations: one group and modified one-group diffusion theory, buckling conversions, core-density conversions, the surface density method, the density analog method, the solid angle method, and the limiting surface density method. The hand methods can be used to delve into the various criticality safety parameters that may affect the multiplication factor, the critical mass, the critical size, or the material spacing in an array of a fissile system. This session will be based on the Primer and will

Technical Sessions by Day (Wednesday)

discuss the applicability of the various hand methods, illustrate how they are used with numerous sample problems, and provide an interpretation of the computed results. Hand calculation methods can be used as a starting point for more advanced calculations and, in many circumstances, can be used as a simple tool to perform perturbation analyses for many fissile systems almost as efficiently as using a criticality safety code. Learning these hand methods can also be valuable to new criticality safety practitioners developing intuition, knowledge, and experience in the field of criticality safety.

PANELISTS:

- Douglas Bowen (*LANL*)
- Robert Busch (*Univ of New Mexico*)

Reactor Physics: General, sponsored by RPD. *Chair:* Luiz Leal (*ORNL*) [Track 7]

Picuris

1:00 p.m.

Nuclear Analysis of a Gas Cooled Fast Transmutation Reactor, S. K. Brashear, T. S. Sumner, K. A. Burns, E. J. Bruch, K. A. Boakye, C. de Oliveira, J. I. Marquez-Danian, W. M. Stacey (*Georgia Tech*)

1:25 p.m.

Thermal and Fluid-Dynamic Effects in the Physics of Molten Salt Reactors, Sandra Dulla, Claudio Nicolino (*Politecnico di Torino*), Giovanni Lapenta (*LANL*), Piero Ravetto (*Politecnico di Torino*)

1:50 p.m.

Evaluation of ^{231}Pa and ^{233}Pa Resonance Parameters and Covariance in the Resolved Resonance Region, L. Leal, H. Derrien (*ORNL*)

2:15 p.m.

Aluminum-Metal Fueled Long Life Fast Reactor Cores with Inherent Safety Features, Tsugio Yokoyama (*AITEL*), Moriyasu Tokiwai (*CRIEPI*), Hisashi Ninokata, Hiroshi Endo (*Tokyo Inst Technol*)

2:40 p.m.

Monte Carlo Evaluation of Deep-Burn of TRU in HTGR, Yonghee Kim (*KAERI*)

3:05 p.m.

Representativity Studies for Sodium- and Gas-Cooled Reactors, G. Aliberti, G. Palmiotti, M. Salvatores (*ANL*)

3:30 p.m.

ENDF/B-VII β -2, ENDF/B-VI, and JENDL-3.3 Results for Unreflected Plutonium Solutions and MOX Lattices, Russell D. Mosteller (*LANL*)

University Reactor and Nuclear Research—I-Panel, sponsored by OPD. *Session Organizers:* John Gutteridge (*DOE*), Bob Fjeld (*Clemson Univ*). *Chair:* John Gutteridge [Track 8]

Sandia

1:00 p.m.

The U.S. Department of Energy's Innovations in Nuclear Infrastructure and Education (INIE) program established in 2002 supports the rebuilding of selected portions of the U.S. nuclear science and engineering educational structure. The INIE grants encourage collaborative research and educational efforts between universities, industry, and national laboratories in order to increase the usage of existing university research reactor programs and the academic goals they support. This panel represents a progress review of each of the six existing INIE partnerships representing more than 32 nuclear and radiological engineering programs.

PANELISTS:

- Western Nuclear Science Alliance (panelist to be determined)
- Big-10 University and Training Reactors (panelist to be determined)
- New England Consortium (panelist to be determined)
- Midwest Nuclear Science and Engineering Consortium (panelist to be determined)
- Multi-University Southeast INIE Consortium (panelist to be determined)
- Southwest Consortium of Research Reactors (panelist to be determined)

Contributions of Nuclear Science and Technology to Sustainable Development, sponsored by ESD. *Chair:* Sama Bilbao y Leon (*Dominion*) [Track 7]

Santa Ana

1:00 p.m.

Specific Energy of Appropriate Fuels, Paul Kruger (*Stanford*)

1:25 p.m.

A Study on a Comparative Assessment Among the Electricity Generating Systems in Korea by Using a Monetary Value, Kilyoo Kim, SeongHo Kim, Taewoon Kim (*KAERI*)

1:50 p.m.

Ecology Aspects of Armenian Energy Development, A. A. Gevorgyan (*Armenia Ministry of Energy*), V. Z. Marukhyan (*Univ of Armenia*)

2:15 p.m.

Primary System Design for Lead Cooled Battery Fast Reactor BORIS, Hyoung M. Son, Yong H. Yu, Kune Y. Suh (*Seoul Natl Univ*)

2:40 p.m.

Computational Fluid Dynamics Analysis for an Optimal Supercritical Carbon Dioxide Turbine Blade, Tae W. Kim, Nam H. Kim, Kune Y. Suh (*Seoul Natl Univ*)

3:05 p.m.

Study of Acid Resistant of Diamond Coatings for Use in Thermochemical Hydrogen Cycles, Michael S. Peck, Jessica M. Peck, Dabir S. Viswanath, Tushar K. Ghosh, Mark A. Prelas (*Univ of Missouri, Columbia*)

Nuclear Nonproliferation and International Safeguards Measurement Technologies—II, sponsored by IRD. *Session Organizers:* Stephen LaMont (*LANL*), Michael Miller (*LANL*). *Chair:* Ned Wogman (*PNNL*) [Track 1]

Laguna

1:00 p.m.

An Advanced Measurement System for Research Reactor Spent Fuel Assemblies, H. O. Menlove, M. T. Swinhoe, J. B. Marlow (*LANL*)

1:25 p.m.

Determination of Pu in Spent Fuel Assemblies Using Self-Fluorescent X-Rays, Clifford Rudy, Kristin Chesson, Andrew Hoover, Michael Rabin (*LANL*), Joel Ullom (*NIST*)

1:50 p.m.

The Next-Generation Attribute Measurement System, Jonathan Thron, Dave Bracken, Lou Carrillo, Tim Elmont, Kate Frame, Janice Gallegos, Peter Karpus, Duncan MacArthur, Jason Shergur, Morag Smith, Duc Vo, Richard Williams (*LANL*)

2:15 p.m.

Calculation of Neutron Background at Uranium Enrichment Facilities, Sang-Yoon Lee, David H. Beddingfield, Mark M. Pickrell (*LANL*)

2:40 p.m.

Microcalorimeter Nuclear Spectrometers: Examining the Nuclear Fingerprint, M. W. Rabin, A. S. Hoover, S. P. LaMont, C. R. Rudy, D. M. Tournear, D. T. Vo (*LANL*), J. A. Beall, W. B. Doriese, R. A. Horansky, K. D. Irwin, J. N. Ullom (*NIST*), B. L. Zink (*Univ of Denver*)

3:05 p.m.

Nuclear Forensics: Characterization of Plutonium Isotopics by Reactor Modeling, Adrienne M. LaFleur, Lav Tandon, Elizabeth Hastings, David H. Beddingfield (*LANL*)

3:30 p.m.

Plutonium Metal Exchange Program: A Brief Overview, Lav Tandon, Kevin Kuhn, Sarah E. Michalak, Diane Tompkins, Donald Temer, Darryl Jackson, Diana Decker, Donivan Porterfield, Laurie Walker, Amy Wong (*LANL*)

Technical Sessions by Day (Wednesday & Thursday)

Development of Conversion Processes and Remote Fuel Fabrication Capabilities for Transmutation Fuels, sponsored by FCWMD. *Session Organizers:* Dave Williams (ORNL), Barry Spencer (ORNL). *Chair:* Dave Williams [Track 3]

Santo Domingo

1:00 p.m.

Equipment Redundancy and Plant Reliability in Robotic Hot Cells for Fuel Fabrication, Georg F. Mauer (UNLV)

1:25 p.m.

Sphere-Pac Technology for Remote Fabrication of Minor-Actinide Fuels and Targets, G. D. Del Cul, R. R. Brunson, L. K. Felker (ORNL)

1:50 p.m.

Preparation of Mixed Oxides by Modified Direct Denitration, L. K. Felker, R. J. Vedder, E. A. Walker (ORNL)

2:15 p.m.

Qualification Test for a Remotely Fabricated DUPIC Fuel Pellet in a Laboratory, Jung Won Lee, Geun Il Park, Hangbok Choi (KAERI)

2:40 p.m.

Integrated Electrorefining Efficiency Test for Pyrochemical Fuel Cycle, S. X. Li, T. A. Johnson, R. W. Benedict, D. Vaden, B. R. Westphal (INL)

3:05 p.m.

Analysis of Remote Operation in KAERI's Advanced Spent Fuel Conditioning Process (ACP), Ji Sup Yoon, Byung suk Park, Hyo Jik Lee (KAERI)

Nuclear Methods in Support of Nano- to Micro-Domain Sciences, sponsored by BMD; cosponsored by IRD. *Session Organizer:* Rolf Zeisler (NIST). *Chair:* Rolf Zeisler [Track 6]

Apache

1:00 p.m.

Prospects for Improved Micro-Homogeneity in Certified Reference Materials, Rolf Zeisler (NIST)

1:25 p.m.

Neutron Activation Analysis of the Biodistribution of Gum Arabic Gold Nanoparticles in Swine, J. D. Robertson, R. Kannan, K. V. Katti, Genevieve M. Fent, M. E. Dunsmore, S. W. Casteel (Univ of Missouri, Columbia)

1:50 p.m.

Enhanced Reaction Rates in NDP Analysis by Neutron Scattering, R. Gregory Downing (NIST), Sacit Centiner (Penn State)

2:15 p.m.

Neutron Reflectometry Measurements of Structure and Hydration in Fuel Cell Membranes, Joseph A. Dura (NIST)

Biology and Medicine: General, sponsored by BMD. *Session Organizer:* Dennis James (Texas A&M). *Chair:* Suresh Aghara (Prairie View A&M Univ) [Track 6]

Apache

2:45 p.m.

TransMED—A Deterministic Approach to Transport Calculations for Medical Physics, Eric N. Jones, Dean B. Jones, Ken E. Watkins (TransWare Enterprises)

3:10 p.m.

Estimation of Biological Half-Life of Radioiodine Thyroid Uptake Rate and Urinary Excretion Rate, Junghoon Kim, Sanghwa Shin, Jooho Whang (Kyung Hee Univ)

3:35 p.m.

Impact of Magnetic Fields on Dose Distributions Delivered with a Device for 3D Image-Guided Radiotherapy, B. Dionne, A. Haghghat, J. Dempsey (Univ of Florida)

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

THURSDAY • NOVEMBER 16, 2006

7:30 AM - 2:00 PM MEETING REGISTRATION

8:30 AM - 11:30 AM NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)

8:30 AM - 11:30 AM 2006 ANS WINTER MEETING TECHNICAL SESSIONS

- Experiments in Support of Accelerator Applications—Papers/Panel
- Computational Resources for Radiation Protection & Shielding—II
- Safeguarding Radiation Sources & Radioactive Materials
- Emerging Topics in Nuclear Installation Safety Technology
- General Two-Phase Flow
- Nuclear Criticality Safety Standards—Forum
- Computational Methods: General
- Materials Science: General
- University Reactor & Nuclear Research—II
- Environmental Aspects of the Management of Radioactive Waste
- Nuclear Archaeometry—I
- Comparison of Actinide Transmutation in Fast & Thermal Spectrum Reactors & Optimized Combinations

1:00 PM - 4:00 PM NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)

1:00 PM - 4:00 PM 2006 ANS WINTER MEETING TECHNICAL SESSIONS

- Education & Training: General
- Monte Carlo Tutorial
- Computational Thermal Hydraulics
- Nuclear Archaeometry—II
- Validation: How Much Is Enough?
- Software Safety for Digital Electronics in Nuclear Safety Systems
- Recent Developments in Fuel Cycle Modeling & Systems Analysis—II
- Robotics at the U.S. Department of Energy National Laboratories—Panel

THURSDAY, NOVEMBER 16, 2006 • 8:30 A.M.

Experiments in Support of Accelerator Applications—Papers/Panel, sponsored by AAD; cosponsored by MSTD. *Session Organizer:* Denis E. Beller (UNLV). *Chair:* Denis E. Beller [Track 8]

Acoma

PAPERS

8:30 a.m.

Update on the Reactor-Accelerator Coupling Experiments (RACE) Project, Denis E. Beller (UNLV)

8:55 a.m.

Summary of the International Workshop on Hadronic Shower Simulations, Laurie S. Waters (LANL)

PANEL DISCUSSION

9:20 a.m.

PANELISTS:

- Denis E. Beller (UNLV)
- Itacil Gomes (ICGomes Consult and Investment)
- James Jones (INL)
- Niita Koji (JAEA)
- Eric Pitcher (LANL)
- Timothy E. Beller (UNLV)
- Ryan LeCounte (UNLV)

Computational Resources for Radiation Protection and Shielding—II, sponsored by RPSD. *Session Organizer:* John S. Hendricks (LANL).

Chair: Jeremy E. Sweezy (LANL) [Track 7]

Zuni

8:30 a.m.

TORTSQ—A SCALE Sequence for 3-D Discrete Ordinates Calculations, Dan Ilas, John Wagner (ORNL)

8:55 a.m.

Monaco/MAVRIC: Computational Resources for Radiation Protection and Shielding in SCALE, Douglas E. Peplow, Stephen M. Bowman, James E. Horwedel, John C. Wagner (ORNL)

9:20 a.m.

Recent Developments and Future Plans for MCNP5, Thomas E. Booth, Forrest B. Brown, Jeffrey S. Bull, J. Tim Goorley, H. Grady Hughes, Roger L. Martz, Samuela J. Pollack, Avneet Sood, Jeremy E. Sweezy, Charles N. Zeeb, Anthony J. Zukaitis (LANL)

Technical Sessions by Day (Thursday)

9:45 a.m.

MCNPX Features for 2006, G. W. McKinney, J. W. Durkee, J. S. Hendricks, M. R. James, D. B. Pelowitz, L. S. Waters (*LANL*)

10:10 a.m.

ELA: Event Log Analyzer, Roger L. Martz (*LANL*)

10:35 a.m.

Surfaces from the GIFT5 Truncated Elliptical Cone, Kenneth A. Van Riper (*White Rock Science*)

11:00 a.m.

Application of MCNP, MERCURY and TART to Calculation of the National Ignition Facility (NIF) Shielding, Scott McKinley, Dermott E. Cullen, Jeffery F. Latkowski, Richard Procassini, Kenneth M. Skulina (*Univ of California/LLNL*)

Safeguarding Radiation Sources and Radioactive Materials,

sponsored by RPSD; cosponsored by IRD. *Session Organizer:* John S. Hendricks (*LANL*). *Chair:* Greg Wyss (*SNL*) [Track 1]

Tesuque

8:30 a.m.

Keeping the Nation Safe, Removal of the Georgia Tech Co-60 Sources, Dwayne P. Blaylock, Nolan E. Hertel, Eric Burgett (*Georgia Tech*)

8:55 a.m.

Balancing Progress and Responsibility, Galya I. Balatsky, William R. Severe, Julia Whitworth (*LANL*), Andrew G. Sowder (*U.S. Dept of State*)

9:20 a.m.

Probabilistic Basis and Assessment Methodology for Effectiveness of Protecting Nuclear Materials, Felicia A. Durán (*SNL/Univ of Texas, Austin*), Pamela G. Dawson, Gregory D. Wyss (*SNL*)

9:45 a.m.

A Cyber-Physical Security Assessment Methodology (CPSAM), J. Darby, J. Phelan, P. Sholander, G. B. Varnado, G. Wyss (*SNL*)

10:10 a.m.

Risk-Based Decision Approaches for Safeguards and Security Management, Gregory D. Wyss, John L. Darby, Pamela G. Dawson, Karen J. Page, Eric E. Ryder (*SNL*)

10:35 a.m.

Safeguards and Security at a Facility Level, Steve Woods, Dwaine Brown (*Halliburton Energy Services*)

Emerging Topics in Nuclear Installation Safety Technology,

sponsored by NISD; cosponsored by NCSD. *Session Organizer:* Raymond Gallucci (*NRC*). *Chair:* Steve Nowlen (*SNL*) [Track 4]

Cochiti

8:30 a.m.

The CAROLFIRE Project: A Further Exploration of Cable Failure Behavior, Steven P. Nowlen, F. Wyant (*SNL*), Mark Henry Salley, Hugh Woods (*NRC*), Kevin McGrattan (*NIST*), Genebelin Valbuena, Elyahu Avidor (*Univ of Maryland, College Park*)

8:55 a.m.

Improving Blast Fragility Estimates for Nuclear Facility Components, C. David Sulfredge, Robert H. Morris (*ORNL*)

9:20 a.m.

MOX Project Safety Analysis—Demonstration of the Non-Aqueous Polymerization of Plutonium(IV), Patricia Paviet-Hartmann (*AREVA*), G. Scott Barney (*DCS*), Gerald Senentz (*AREVA*)

9:45 a.m.

Investigation of the Stability of Tributyl Phosphate-Hydrogenated Polypropylene Tetramer in Nitric Acid, and Prevention of the Red Oil Reaction, M. A. Vial (*Duke Cogema Stone & Webster*), H. Fauske, C. Askonas (*Fauske & Assoc*), G. H. Senentz (*Duke Cogema Stone & Webster*)

10:10 a.m.

A Quadrennial Review of Safety-Related Physics Studies at HFIR, R. T. Primm III (*ORNL*)

10:35 a.m.

Full Scale Modeling of Air Entrainment and Transport, Daniel Gessler (*Alden Research Lab*), Jim Mead (*Duke Energy*), Philip S. Stacy (*Alden Research Lab*)

11:00 a.m.

Updating the EPRI Seismic Source Model—ESP Site, Clinton, Illinois, Kathryn L. Hanson, Robert Youngs (*Geomatrix Consultants*)

General Two-Phase Flow, sponsored by THD. *Session Organizers:* S. Revankar (*Purdue Univ*), K. Sun (*Ohio State*), J. Kim (*EPRI*). *Chair:* Nicholas R. Brown (*Purdue Univ*) [Track 7]

Taos

8:30 a.m.

Performance Assessment of the Two-Phase Pump Degradation Model in the RELAP5-3D Transient Safety Analysis Code, Jeffrey W. Lane, L. E. Hochreiter (*Penn State*), D. L. Aumiller, Jr., R. J. Kushner (*Bechtel Bettis*)

8:55 a.m.

Eulerian Two-Phase Boiling Model Development for Boiling Water Reactor Fuel Assembly Applications, W. David Pointer, Adrian Tentner, Tanju Sofu, David Weber (*ANL*), Thomas Keheley (*AREVA Framatome ANP*), Simon Lo, Andrew Splawski, Eric Volpenheim (*CD-adapco Grp*)

9:20 a.m.

Examination of PWR Steam Generator Tube Condensation, Brian G. Woods, John Groome, Brian Collins (*Oregon State Univ*)

9:45 a.m.

The Condensation Heat Transfer with Non-Condensable Gas Under the Natural Convection in the High Pressure Closed System, H. K. Ahn, J. W. Kim, G. C. Park (*Seoul Natl Univ*)

10:10 a.m.

A Study on Bubble Detachment in Horizontal Sub-Cooled Boiling Flows, Wen Wu, Peipei Chen, Barclay G. Jones, Ty A. Newell (*Univ of Illinois*)

10:35 a.m.

Heat Transfer Coefficient Computational Model for Tube Boiler with Twisted-Tape, Chaqing Liao, Ryoji Oinuma, Cable R. Kurwitz (*Texas A&M*)

11:00 a.m.

Complex 3D Two-Phase Flow Simulation and Application to Orifice Flow, A. Minato, K. Katouno, N. Ishida, T. Nagayoshi (*Hitaichi*)

Nuclear Criticality Safety Standards-Forum, sponsored by NCSD. *Session*

Organizer: Thomas P. McLaughlin (*LANL*). *Chair:* Thomas P. McLaughlin [Track 4]

Nambe/Navajo

8:30 a.m.

Computational Methods: General, sponsored by MCD. *Session Organizer:*

Dmitriy Y. Anistratov (*NCSU*). *Chair:* Rizwan-uddin (*Univ of Illinois*) [Track 7]

Picuris

8:30 a.m.

Determination of Ex-Core Detector Responses Using a Constrained Genetic Algorithm, Ho Cheol Shin, Moon Ghu Park, Yong Kwan Lee (*KEPRI*)

8:55 a.m.

A Nodal Integral Method for Neutron Diffusion Equation in Polar Coordinates, Suneet Singh, Rizwan-uddin (*Univ of Illinois*)

9:20 a.m.

DSMC Aerosol Dynamics: Coagulation, Deposition, and Source Reinforcement, Geethpriya Palaniswaamy, Sudarshan K. Loyalka (*University of Missouri, Columbia*)

Materials Science: General, sponsored by MSTD. *Session Organizer:* Travis

Knight (*Univ of South Carolina*). *Chair:* Travis Knight [Track 8]

Picuris

9:50 a.m.

Spectroscopic Studies of Pb Corrosion of Reactor Materials, Shanshan Liu, Daniel Olive, Jeff Terry, Carlo Segre (*IIT*)

10:15 a.m.

Implementation of the REBO Potential for Molecular Dynamic Studies of Graphite, B. D. Hehr, A. I. Hawari, V. H. Gillette (*NCSU*), A. M. Ougouag (*INL*)

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

Technical Sessions by Day (Thursday)

University Reactor and Nuclear Research—II, sponsored by OPD.

Chair: Sean O'Kelly (*Univ of Texas, Austin*) [Track 8]

Sandia

8:30 a.m.

Keeping the Nuclear Education Pipeline Full and Flowing, D. S. O'Kelly, S. Biegalski, T. Green, B. Hurst, C. Lei, S. M. Whitney (*Univ of Texas, Austin*)

8:55 a.m.

An Experimental Approach to Estimation of Human Information Processing Capacity, Ji Tae Kim, Poong Hyun Seong (*KAIST*)

9:20 a.m.

Use of Influence Diagrams for Diagnosing Accident Types, Kyung Min Kang, Moosung Jae (*Hanyang Univ*), Kune Y. Suh (*Seoul Natl Univ*)

9:45 a.m.

Development of Nuclear Power Plant Online Monitoring System Using Statistical Quality Control, Sang Ha An, Yong Hoon Jeong, Soon Heung Chang (*KAIST*)

10:10 a.m.

A Software Tool for the Creation and Analysis of Dynamic Event Trees, Benjamin Rutt, Aram Hakobyan, Kyle Metzroth, Umit Catalyurek, Tunc Aldemir (*Ohio State*), Dave Kunsman, Sean Dunagan (*SNL*)

10:35 a.m.

Detector Development in the Kansas State University SMART Laboratory, D. S. McGregor, A. Kargar, W. J. McNeil, M. F. Ohmes, B. Rice, J. K. Shultis, T. Unruh (*Kansas State Univ*)

11:00 a.m.

Radiation Chemistry Results from the Supercritical Water Loop at UW-Madison, Eric J. Edwards, Paul P. H. Wilson, Mark Anderson (*Univ of Wisconsin, Madison*), David Bartels (*Notre Dame Rad Lab*)

Environmental Aspects of the Management of Radioactive Waste, sponsored by ESD; cosponsored by FCWMD. Chair: Robert Addis (*SRNL*) [Track 3]

Santa Ana

8:30 a.m.

Environmental Impact Assessment with the Specific of Ulsan Area in Korea, Sanghwa Shin, Arum Kim, Junghoon Kim, Jooho Whang (*Kyung Hee Univ*)

8:55 a.m.

A Study on the Dose Rate Assessment at the Site Boundary Considering Additional Spent Fuel Storage Facilities in Wolsung Site, Yoon Hee Lee, Chang Min Lee, Kun Jai Lee (*KAIST*)

9:20 a.m.

Plugging Effects on Depressurization Time in Dry Storage Containers with Pinhole Breaches, Andrew M. Casella, Sudarshan K. Loyalka (*Univ of Missouri, Columbia*), Brady D. Hanson (*PNNL*)

9:45 a.m.

Development of Nondestructive Identification Method for Material Using Color X-Ray Imaging System, Masayo Nakane, Koichi Nittoh, Chikara Konagai, Katsumi Hosaka, Hitoshi Sakai (*Toshiba*)

10:10 a.m.

The Radioactivity of ^3H and ^{14}C in the Charcoal Samples by Using a High Temperature Furnace and a LSC, Hee-Reyoung Kim, Wannoo Lee, Kun Ho Chung, Geun Sik Choi, Chang Woo Lee (*KAERI*)

Nuclear Archaeometry—I, sponsored by IRD. Session Organizer: Michael Glascock (*Univ of Missouri, Columbia*). Chair: Michael Glascock [Track 6]

Laguna

8:30 a.m.

Analysis of Micaceous Clay Sources in the Northern Rio Grande, B. Sunday Eiselt (*SMU*), Richard I. Ford (*Univ of Michigan*)

8:55 a.m.

Characterization of New England Chert Sources by Neutron Activation, Matthew T. Boulanger, Robert J. Speakman, Michael D. Glascock (*Univ of Missouri, Columbia*)

9:20 a.m.

Neutron Activation Analysis of Medieval Limestone Sculpture at the University of Missouri Research Reactor Center, Robert J. Speakman, Michael D. Glascock (*Univ of Missouri, Columbia*), Charles T. Little (*Metropolitan Museum of Art*)

9:45 a.m.

Compositional Analysis of Basalts from Quarries in American Samoa, P. R. Johnson, W. D. James (*Texas A&M*)

10:10 a.m.

Geochemistry and Provenance Research on Obsidian from the Kamchatka Peninsula, Michael D. Glascock, Robert J. Speakman (*Univ of Missouri, Columbia*), Vladimir K. Popov, Yaroslav V. Kuzmin (*RAS*)

Comparison of Actinide Transmutation in Fast and Thermal Spectrum Reactors and Optimized Combinations, sponsored by FCWMD; cosponsored by RPD. Session Organizers: Charles Forsberg (*ORNL*), Emory D. Collins (*ORNL*). Chair: Steve Herring (*INL*) [Track 3]

Santo Domingo

8:30 a.m.

Systematic Method for Optimizing Plutonium Transmutation in LWRs, Reuben T. Sorensen, Jeffrey C. Davis, John C. Lee (*Univ of Michigan*)

8:55 a.m.

Transmutation Pathway Capitalization: Fast Burner Reactor Control and Actinide Destruction, Samuel E. Bays, J. Stephen Herring (*INL*)

9:20 a.m.

Utilization of Fast Reactors to Control Inventories of Plutonium and Minor Actinides in Advanced Fuel Cycles, L. F. Miller, J. Preston, T. Anderson, J. McComm, F. R. Mynatt (*Univ of Tennessee*), Luc Van Den Duerpel (*ANL*)

9:45 a.m.

Comparative Evaluation of TRU Actinide Transmutation in Fast and Thermal Burner Reactors, Emory D. Collins, John Paul Renier (*ORNL*)

10:10 a.m.

A Neutronic Feasibility Study on the Recycling of an Oxide Fuel in a Sodium-Cooled Fast Reactor, Gyuhong Roh, Hangbok Choi (*KAERI*)

THURSDAY, NOVEMBER 16, 2006 • 1:00 P.M.

Education and Training: General, sponsored by ETD. Session Organizer: Mike Robinson (*Bechtel Bettis*). Chair: Mike Robinson [Track 9]

Zuni

1:00 p.m.

Development and Implementation of MU's Graduate Certificate in Nuclear Safeguards Science and Technology, John M. Gahl, Kathleen M. Trauth, William H. Miller, Mark A. Prelas, John M. Ball, Gayla M. Neumeier (*Univ of Missouri, Columbia*)

1:25 p.m.

Implementing an Undergraduate Nuclear Engineering Minor at Wilberforce University, Brian K. Hajek (*Ohio State*), Edward Asikele, Kamal Fernando, Mattie Vaughn (*Wilberforce Univ*)

1:50 p.m.

A Student's Perspective on Energy, Policy, Economics & Ethics, Katherine Gray (*Univ of Missouri, Columbia*)

2:15 p.m.

International Training Program: 3D S.UN.COP—Scaling, Uncertainty and 3D Thermal-Hydraulics/Neutron-Kinetics Coupled Codes Seminar, A. Petruzzi, F. D'Auria (*Univ of Pisa*), T. Bajs (*Univ of Zagreb*), F. Reventos (*School of Ind Eng Barcelona*)

Monte Carlo Tutorial, sponsored by RPSD. Session Organizer: John S. Hendricks (*LANL*). Chair: John S. Hendricks [Track 7]

Cochiti

Technical Sessions by Day (Thursday)

1:00 p.m.

The Monte Carlo tutorial is a hands-on session where attendees will learn how and practice setting up and running simple Monte Carlo problems. It is designed for those who have never run a Monte Carlo calculation before.

Those attending this session will be shown how to set up and run simple problems with the MCNP/MCNPX family of Monte Carlo codes. Participants contacting the organizer (jxh@lanl.gov) in advance may be able to have the code on their personal laptop. Additional laptops will be brought to the session so that everyone will be able to try what is being demonstrated.

Computational Thermal Hydraulics, sponsored by THD; cosponsored by MCD. *Session Organizers:* Yassin Hassan (*Texas A&M*), Hisashi Ninokata (*Tokyo Inst of Technol*), Donald Todd (*AREVA*). *Cochairs:* Hisashi Ninokata, Yassin Hassan [Track 7]

Taos

1:00 p.m.

Direct Numerical Simulation of Turbulent Flows in an Eccentric Annulus Channel, Tsunayuki Okumura, Elia Merzari, Hisashi Ninokata (*Tokyo Inst of Technol*)

1:25 p.m.

Computational Flow Predictions for the Lower Plenum of a High-Temperature, Gas-Cooled Reactor, Donna Post Guillen (*INL*)

1:50 p.m.

CFD Simulation of Heat Transfer in Cavities, Constantine P. Tzanos (*ANL*)

2:15 p.m.

Uncertainty Analysis of a Fully Implicit Reactor Core Model, Vincent A. Mousseau (*LANL*)

2:40 p.m.

Numerical and Experimental Analysis of Turbulent Flow Along a Rod Bundle, Robert E. Spall, Barton L. Smith, Adam H. Richards (*Utah State Univ*), Donald M. McEligot (*INL*)

3:05 p.m.

Specifying Standard Problems for Validating Advanced Reactor Computational Fluid Dynamics Analysis Tools, Richard R. Schultz, Hugh M. McIlroy, Jr., Glenn C. McCreery, Richard W. Johnson, Donald M. McEligot (*INL*)

3:30 p.m.

Development of a Linked Analysis Method with RELAP5 & MAAP4 and Its Application, Chang Hwan Park, Yong Won Choi, Joon Sue You, Un Chul Lee (*Seoul Natl Univ*)

Nuclear Archaeometry—II, sponsored by IRD. *Session Organizer:* Michael Glascock (*Univ of Missouri, Columbia*). *Chair:* Michael Glascock [Track 6]

Nambe/Navajo

1:00 p.m.

Instrumental Neutron Activation Analysis Characterization of Ochre Sources from Southern Arizona, Rachel S. Popelka-Filcoff, Elizabeth J. Miksa, J. David Robertson, Michael D. Glascock (*Univ of Missouri, Columbia*), Henry Wallace (*Desert Archaeology*)

1:25 p.m.

Instrumental Neutron Activation Analysis (INAA) and Postclassic Maya Pottery Manufacturing, Leslie G. Cecil, Michael D. Glascock (*Univ of Missouri, Columbia*)

1:50 p.m.

Chemical Characterization of Mimbres Classic Black-on-White Pottery, E. S. Dahlin, W. D. James (*Texas A&M*)

Validation: How Much Is Enough?, sponsored by NCS. *Session Organizer:* Lane Paschal (*Paschal Sol*). *Chair:* Clint Gross (*Paschal Sol*) [Track 4]

Nambe/Navajo

2:20 p.m.

Recent Validation Experience at BWXT, Larry L. Wetzel, Linda Farrell (*BWXT*)

2:55 p.m.

Where Does Validation Fit in Today's NCS World?, Larry L. Wetzel (*BWXT*)

3:20 p.m.

A Criticality Code Validation Exercise for a LEU Lattice, Bradley T. Rearden (*ORNL*)

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

Software Safety for Digital Electronics in Nuclear Safety Systems

sponsored by NISD. *Session Organizer:* Dana A. Powers (*SNL*). *Chair:* Vanice Perin (*NRC*) [Track 2]

Picuris

1:00 p.m.

Software Qualification Strategy for the Digital Safety Systems in KNICS, Kee-Choon Kwon, Jang-Soo Lee, Se Woo Cheon (*KAERI*)

1:25 p.m.

Interface Analysis for Communication Tasks in the Safety Grade Programmable Logic Controller, Ahyoung Sung, Jina Jang, Byoungju Choi (*Ewha Univ*)

1:50 p.m.

Test Case Selection for RTOS Inter-Task Communication Based on OS API and HW Interfaces, Ahyoung Sung, Jina Jang, Byoungju Choi (*Ewha Univ*)

2:15 p.m.

UML Modeling, Verification and Testing for the Safety System, Dae Yon Hwang (*Korea Univ*), Na Young Lee (*Seoul Natl Univ*), Yun Goo Kim (*Samchang Enterprise*), Jin Young Choi (*Korea Univ*)

2:40 p.m.

An Advanced Real-Time Graphic Display Engine for Nuclear Power Plants, Steve Yang, Xu Huang, Jonathan Taylor (*HF Controls Corp*)

Recent Developments in Fuel Cycle Modeling and Systems Analysis—II

sponsored by FCWMD. *Session Organizer:* Mary Lou Dunzik-Gougar (*Idaho State Univ*). *Chair:* Scott G. Gillespie (*Bechtel SAIC*) [Track 3]

Santa Ana

1:00 p.m.

Strategies for Estimating LWR Spent Fuel Compositions in Fuel Cycle System Codes, A. M. Yacout, T. K. Kim, T. A. Taiwo, R. N. Hill (*ANL*)

1:25 p.m.

Advanced Fuel Cycle Economic Sensitivity Analysis, David Shropshire (*INL*), Kent Williams (*ORNL*), J. D. Smith (*SNL*), Brent Boore (*WSRC*)

1:50 p.m.

Compartment Model for a Geologic Repository with Stochastic Approach, H. Murakami, J. Ahn (*Univ of California, Berkeley*)

2:15 p.m.

Repository Models for Fuel Cycle Systems Studies, Paul P. H. Wilson, Rachna Jain (*Univ of Wisconsin, Madison*)

2:40 p.m.

Modeling the Radiolysis Effect on CSNF Dissolution Kinetics, Amanda Kline (*Univ of Missouri, Columbia*), Brady Hanson (*PNNL*), William Miller (*Univ of Missouri, Columbia*), Richard Wittman (*PNNL*)

Robotics at the U.S. Department of Energy National Laboratories—Panel

sponsored by RRS. *Session Organizers:* Eric Kriikku (*WSRC*), Carl Crane (*Univ of Florida*). *Chair:* Eric Kriikku [Track 2]

Laguna

1:00 p.m.

This panel will consist of senior members representing the robotics groups from six national laboratories. Each panelist will give a brief summary of his group's capabilities, recent robotic or remote systems projects, and a forecast of future work. The panel goal is for audience members to state current and future remote systems needs and for the panelists to offer possible solutions from industry and from the national laboratories.

PANELISTS:

- Frank Heckendorn II (*WSRC*)
- Mike Rinker (*PNNL*)
- John Feddema (*SNL*)
- Mark Noakes (*ORNL*)
- Derek Wadsworth (*INL*)
- Dan Knobloch (*LANL*)

Embedded Topical Meeting #1: TOFE

17th Topical Meeting on the Technology of Fusion Energy (TOFE)

Publication support for TOFE has been generously provided by the Atomic Energy Society of Japan and Sandia National Laboratories.

CONDENSED SCHEDULE

ROOM	MONDAY NOVEMBER 13th	TUESDAY NOVEMBER 14th				WEDNESDAY NOVEMBER 15th			
	3:00–5:00 PM	8:00–10:00 AM	10:00–11:30 AM	1:00–3:00 PM	3:00–5:00 PM	8:00–10:00 AM	10:00–11:30 AM	1:00–3:00 PM	3:00–5:00 PM
Dona Ana	Opening Plenary: Fusion Energy Program Overview <i>(Combined Room – Dona Ana/Galisteo)</i>	Power Plant Studies— ARIES CS—I	In-Vessel Components		Power Plant Studies	In-Vessel Components and Magnets	Alternate Non-Electric Applications—I	Alternate Non-Electric Applications—II	IFE Chamber Dynamics and Clearing
Galisteo		High Heat Flux Components—I	IFE Target Fabrication, Injection, and Tracking		High Heat Flux Components—II	IFE Drivers	Radwaste Management and Plasma Engineering, Heating, and Control	Material and Component Test Facilities	Blanket Testing and Safety and Environment
Cimarron		Tritium Handling and Processing—I	Hydrogen Production, Socioeconomics and Other Fusion Ideas		Computational Tools and Validation Experiments	Engineering of Experimental Devices	Structural and Breeding Materials	Nuclear Analysis and Experiments	Diagnostics
Aztec								Power Plant Studies— ARIES CS—II	Tritium Handling and Processing—II
Ulam Ballroom <i>(Doubletree Hotel)</i>				Poster Session					

TOFE MEETING OFFICIALS



Craig Olson
Sandia National Laboratories
GENERAL CHAIR



Gary Rochau
Sandia National Laboratories
TECHNICAL PROGRAM CHAIR

TECHNICAL SESSIONS BY DAY

MONDAY, NOVEMBER 13, 2006 • 3:00 P.M.

Opening Plenary: Fusion Energy Program Overviews, All invited,
Chair: Craig Olson

Dona Ana/Galisteo

- Welcome, Craig Olson
- ITER International Program, Kaname Ikeda
- Status and Plans of the U.S. ITER Project, Ned Sautoff
- The National Ignition Facility, Ed Moses
- Overview of ARIES-CS Compact Stellarator Power Plant Study, Farrokh Najmabadi
- Overview of Recent Japanese Activities and Plans in Fusion Technology, I. Yamamoto, T. Nishitani, A. Sagara
- The HAPL Program: Developing Technologies for Laser Fusion Energy, John Sethian, Stephen Obenschain
- Z-Pinch Inertial Fusion Energy (Z-IFE) Program, Craig L. Olson, Z-IFE Team

TUESDAY, NOVEMBER 14, 2006 • 8:00 A.M.

Power Plant Studies—ARIES CS—I, Chair: C. Baker

Dona Ana 8:00 a.m.

Engineering Design and Analysis of the ARIES-CS Power Plant, A. R. Raffray, L. El-Guebaly, T. Ihli, S. Malang, X. Wang, ARIES-CS Team, invited

8:20 a.m.

Optimization of the ARIES-CS Compact Stellarator Power Plant Parameters, J. F. Lyon, L. P. Ku, L. El-Guebaly, L. Bromberg, ARIES Team, invited

MONDAY • NOVEMBER 13, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
7:45 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY – CONTINENTAL BREAKFAST [Sponsored by EnergySolutions (We're Part of the Solution)]
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY (see pg 12) "Ensuring the Future in Times of Change: Nonproliferation and Security"
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: "Sandia Peak Tram/Artesian Winery"
11:30 AM - 6:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	ATTENDEE LUNCHEON IN THE ANS NUCLEAR TECHNOLOGY EXPO
1:00 PM - 2:45 PM	ANS PRESIDENT'S SPECIAL SESSION (see pg 12) "Perspectives on the Global Nuclear Energy Partnership"
2:45 PM - 5:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
2:45 PM - 5:30 PM	NPIC&HMIT 2006: OPENING PLENARY SESSION (see pg 41)
3:00 PM - 5:30 PM	TOFE 2006: OPENING PLENARY SESSION—"Fusion Energy Program Overviews"
4:30 PM - 6:00 PM	RECEPTION IN THE ANS NUCLEAR TECHNOLOGY EXPO
6:50 PM - 10:00 PM	EVENING EVENT: "Reception at the National Atomic Museum" <i>(Cosponsored by Lockheed Martin on behalf of Sandia National Laboratories)</i>

Embedded Topical Meeting #1: TOFE

TUESDAY • NOVEMBER 14, 2006	
7:30 AM - 5:00 PM	MEETING REGISTRATION
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 10:00 AM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• Power Plant Studies—ARIES CS—I• High Heat Flux Components—I• Tritium Handling and Processing—I
8:30 AM - 11:30 AM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
8:30 AM - 11:30 AM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: "Sante Fe"
10:00 AM - 11:30 AM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• In-Vessel Components• IFE Target Fabrication, Injection, and Tracking• Hydrogen Production, Socioeconomics and Other Fusion Ideas
10:00 AM - 2:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	HONORS AND AWARDS LUNCHEON
1:00 PM - 3:00 PM	TOFE 2006 POSTER SESSION
1:00 PM - 4:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
1:00 PM - 4:00 PM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
3:00 PM - 5:00 PM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• Power Plant Studies• High Heat Flux Components—II• Computational Tools and Validation Experiments
4:00 PM - 6:00 PM	GENERAL CHAIR'S SPECIAL SESSION: "Nonproliferation and Security"
6:00 PM - 9:00 PM	NPIC&HMIT 2006 BANQUET (Cosponsored by INVENSYS)
6:00 PM - 9:00 PM	TOFE 2006 BANQUET (Cosponsored by Sandia National Laboratories)

8:40 a.m.
ARIES-CS Loss of Coolant and Loss of Flow Accident Analyses, C. J. Martin, L. A. El-Guebaly

8:55 a.m.
Three-Dimensional Neutronics Analysis of ARIES-CS Using CAD-Based Tools, P.P.H. Wilson, B.C. Kiedrowski, L. El-Guebaly, T.J. Tautges, G. Sviatoslavsky, J.F. Lyon, X. Wang, L.P. Ku, ARIES Team

9:10 a.m.
Configuration Design and Maintenance Approach for the ARIES-CS Stellarator Power Plant, X.R. Wang, S. Malang, A.R. Raffray, ARIES Team

9:25 a.m.
High Performance Superconducting Options for ARIES Compact Stellarator, Leslie Bromberg, J.H. Schultz, L. El-Guebaly, L. Waganer, ARIES Team

High Heat Flux Components—I, Chair: A. Hassanein

Galisteo
8:00 a.m.
Experimental and Numerical Investigation of the Thermal Performance of Gas-Cooled T-Tube Divertor Modules, L. Crosatti, D. L. Sadowski, J. B. Weathers, S. I. Abdel-Khalik, M. Yoda, ARIES Team, invited

8:20 a.m.
Design of an Experimental Facility to Study Natural Convection in Liquid Li, M. A. Jaworski, D. N. Ruzic, invited

8:40 a.m.
Development of Tungsten Materials for Plasma Facing Components in Japan, Yoshio Ueda, invited

9:00 a.m.
Integrated Tests of Water Detritiation and Cryogenic Distillation in View of ITER Design, I. Cristescu, I.R. Cristescu, M. Glugla, D. Murdoch

9:15 a.m.
Investigation of Thin Liquid Layer Rupture for Liquid-Protected Divertors, T. Koehler, M. Yoda, S. I. Abdel-Khalik, D.L. Sadowski, and S. Shin

9:30 a.m.
Hydrogen Isotope Retentions and Erosion/Deposition Profiles in the First Wall of JT-60U, Y. Oya, Y. Hirohata, T. Nakahata, T. Suda, M. Yoshida, T. Arai, K. Masaki, K. Okuno, T. Tanabe

9:45 a.m.
Effects of High Temperature Pulsed Helium Implantation on Tungsten Surface Morphology, Ross.Radel, Gerald Kulcinski

Tritium Handling and Processing—I, Chair: H. Hashizume

Cimarron
8:00 a.m.
Recent Activities on Tritium Technologies for ITER and Fusion Reactors at JAEA, T. Hayashi, K. Isobe, K. Kobayashi, Y. Iwai, Y. Kawamura, H. Nakamura, W.M. Shu, T. Arita, S. Hoshi, T. Suzuki, M. Yamada, T. Yamanishi, invited

8:20 a.m.
Recovery of Tritium from Flibe Blanket in Fusion Reactor, Satoshi Fukada, Akio Morisaki, Akio Sagara, invited

8:40 a.m.
Light Elements Behavior in Fusion Devices Studied with JT-60 and Oxygen Discharge, Satoshi Konishi, Hirofumi Nakamura, Kanetsugu Isobe, Yasushi Yamamoto, and JT-60 Operation Team, invited

9:00 a.m.
ITER Tritium Storage and Delivery System Design and Related R&D, Chang-Shuk Kim

9:15 a.m.
Permeation of Hydrogen Isotopes Through a Nb Membrane: Critical Issues in Tritium Recovery by Vacuum Permeator, Yuji Hatano, Hirofumi Homma, Andrei Busnyuk, Alexander Livshits, Masao Matsuyama

9:30 a.m.
Fundamental Study on Purity Control of the Liquid Metal Blanket Using Solid Electrolyte Cell, Yoshihiko Yamamoto, Toshihiko Yamanishio, Yoshinori Kawamura, Kanetsugu Isobe, Yasushi Yamamoto, Satoshi Konishi

TUESDAY, NOVEMBER 14, 2006 • 10:00 A.M.

In-Vessel Components, Chair: N. Sautoff

Dona Ana
10:00 a.m.
Design of U.S. Contributions to the ITER First Wall and Shield Components, M. A. Ulrickson, T. J. Tanaka, D. L. Youchison, R. E. Nygren, invited

10:20 a.m.
A Self-Cooled Liquid Breeder Blanket for a Laser IFE Power Plant with Magnetic Intervention, A. R. Raffray, A. E. Robson, M. E. Sawan, G. Sviatoslavsky, I. N. Sviatoslavsky, X. Wang

10:35 a.m.
Graphite Tile Thermal Performance on New DIII-D Lower Divertor, C. J. Murphy, P. M. Anderson, C. J. Lasnier

10:50 a.m.
A Parametric Study of 3-D MHD Flows in Expansions of Rectangular Ducts, Leo Bühler

11:05 a.m.
Conceptual Design of Advanced Blanket Using Liquid Li-Pb, Yukihiro Ueno, Satoshi Niigawa, Mikio Enoeda, Yasushi Yamamoto, Satoshi Konishi

IFE Target Fabrication, Injection, and Tracking, Chair: A. Bayraman

Galisteo
10:00 a.m.
Advanced High Gain Targets for Inertial Fusion Energy, L. John Perkins, Riccardo Betti, invited

10:20 a.m.
Fabrication of a High Gain Direct Drive Target for Inertial Fusion Energy, D. T. Goodin, J. F. Hund, B. W. McQuillan, J. T. Bousquet, G. W. Flint, B. A. Vermillion, R. R. Paguio, R. W. Petzoldt, D. G. Schroen, W. Holloway, N. Robertson, M. Weber, J. E. Streit, invited

Embedded Topical Meeting #1: TOFE

10:40 a.m.

The Challenge of an IFE Foam Capsule Overcoat, D. G. Schroen, J. F. Hund, R. R. Paguio, J. E. Streit

10:55 a.m.

Keeping the Cryogenic Targets Layered Until Shot Time in a Z-Pinch IFE Power Plant, R. Gallix P. Mijatovic

11:10 a.m.

Cryogenic Fluidized Bed For Layering of IFE Capsules, N. B. Alexander, D. T. Goodin, G. E. Besenbruch, L. C. Brown, A. S. Bozek, D. T. Frey

Hydrogen Production, Socioeconomics and Other Fusion Ideas,

Chair: W. Meier

Cimarron

10:00 a.m.

Multi-Regional Long-Term Electricity Supply Scenarios with Fusion, Edgard Gnansounou, Denis Bednyagin

10:15 a.m.

Modeling of Z-IFE Hydrogen Plants with MELCOR-H2, Sal B. Rodriguez, Randall O. Gauntt, Randy Cole, Katherine McFadden, Tom Drennen, Bill Martin, Shripad T. Revankar, Karen Vierow, Dave Louie, Louis Archuleta

10:30 a.m.

Hydrogen Production From Biomass Using High Temperature Nuclear Heat, Yuto Takeuchi, Yasushi Yamamoto, Satoshi Konishi

10:45 a.m.

Thermonuclear Dynamo, F. Winterberg

11:00 a.m.

Confirmation of Neutron Production During Self-Nucleated Acoustic Cavitation of a Deuterated Benzene and Acetone Mixture, Edward R. Forrester, David Robbins, Jonathan Martin

TUESDAY, NOVEMBER 14, 2006 • 1:00 P.M.

Poster Session

Doubletree Hotel

Ulam Ballroom

Cryogenic Target Devices for Laser MégaJoules, D. Brisset, V. Lamaison, G. Paquignon, J.P. Périn, E. Bouleau, D. Chatain, J. Manzagol

He-Cooled Molten Lithium TBM for the ITER in Korea, Dong Won Lee, Bong Geun Hong, Yong Hi Kim, Wang Ki In, Jyung Ho Yoon

The Spherical Pinch Fusion Reactor, John T. Nordberg

Spatial Distribution of D-D Neutrons on a Compact Water-Cooled Inertial Electrostatic Confinement Device, T. Takamatsu, T. Fujimoto, K. Masuda, K. Yoshikawa

Systems Modeling for Z-IFE Power Plants, Wayne R. Meier

Design Study of Dry Wall Fast Ignition Laser Fusion Reactor with High Repetition Laser, Takuya Goto, Yuichi Ogawa, Kunihiko Okano, Yoshiyuki Asaoka, Ryoji Hiwatari

Reduce the Impact of Fusion Reactor on Electricity Grid, Yasushi Yamamoto, Satoshi Konishi

Design Windows Analysis Based on a Cost Model of Helical Fusion Power Plants, Y. Kozaki, A. Sagara, S. Imagawa

Heat Transfer Performance for High Prandtl and High Temperature Molten Salt Flow in Sphere-Packed Pipes, Tomoaki Satoh, Kazuhisa Yuki, Hidetoshi Hashizume, Akio Sagara

Stress Waves Induced by Volumetric Heating in IFE Chamber Walls, Jens Conzen, James Blanchard

Effect of Electrolysis on High Temperature Molten Salt Flow in a Magnetic Field, Taiji Kobayashi, Hidetoshi Hashizume, Kazuhisa Yuki

Experiments and Modeling Toward a Fast Flowing Liquid Metal Divertor Protection Concept for NSTX, Manmeet Narula, Alice Ying, Neil B. Morley, K. Messadek, Mohamed Abdou

Simulation of Tungsten Surface Pores Formed by Low-Energy Helium Implantation, Akiyuki Takahashi, Shahram Sharafat, Nasr Ghoniem, J. Kulcinski, R. Radel

Reproduction of Unsteady Flows Behind Two Rods by Using k- ϵ Model, Masaaki Satake, Kazuhisa Yuki, Hidetoshi Hashizume

Target Injection Placement Accuracy Improvement with Electrostatic Steering, R. W. Petzoldt, L. Carlson, P. Huynh

A Continuous, In-Chamber Target Tracking and Engagement Approach for Laser Fusion, Ron. Petzoldt, Neil Alexander, Lane Carlson, Graham Flint, Dan Goodin, Jon Spalding, Mark Tillack

Longitudinal Tracking of Direct Drive Inertial Fusion Targets, J. D. Spalding, L. C. Carlson, M. S. Tillack, N. B. Alexander, G. Flint, D. T. Goodin, R. W. Petzoldt

Continuous Transverse Target Tracking for Inertial Fusion Energy, Lane Carlson, Neil Alexander, Graham Flint, Dan Goodin, Thomas Lorentz, Ronald Petzoldt, Mark Tillack

Increasing Batch Sizes for Production of Gas Tight Permeation Barriers for ICF Targets, B. A. Vermillion, J. T. Bousquet, R. E. Andrews, M. Thi, M. L. Hoppe, E. R. Castillo, A. Nikroo, D. T. Goodin, G. E. Besenbruch

Design Progress of the ITER In-Wall Shielding, M. Morimoto, K. Ioki, A. Terasawa, Yu. Utin

PIV Technique of Measurement of Turbulent Flow Under Magnetic Fields, S. Satake, J. Takeuchi, T. Kunugi, T. Yokomine, N. B. Morley, M. A. Abdou

Implantation of He⁺ in CVD Silicon Carbide, Samuel J. Zenobia, Gerald L. Kulcinski, Ross F. Radel

Three-Dimensional Neutronics Analyses for Heterogeneous Configuration of Helium-Cooled Ceramic Breeder (HCCB) for ITER Test Blanket Module, Wei Zhang, Mahmoud Z. Youssef, Mohamed A. Abdou

Thermo-Mechanical Behavior of Flow Channel Inserts in the U.S.-ITER Dual Coolant TBM, Aaron Aoyama, Shahram Sharafat, Nasr Ghoniem

Experimental Simulation of High Energy-Density Plasma Interaction with Liquid Metal Media for Inertial Fusion Reactor First Wall Studies, Elijah Martin, Mohamed Bourham

MHD Simulation and Pressure Drop Analysis of Liquid LiPb Flow for ITER DFLL-TBM with Insulating Coating, Hongli Chen, Yican Wu

Tungsten Lamellae Tile Design for the Alcator C-Mod Lower Divertor Module: Transient Thermal and Electromagnetic Stress Analysis, Thomas Willard, Samuel Pierson

Equation of State Considerations for Liquid Fluoride, Robert R. Peterson, Shane D. Walton, Donald S. Lemons

Shock Mitigation Using Compressible Two-Phase Jets for Z-Pinch IFE Applications, C. C. Lascar, D. L. Sadowski, S. I. Abdel-Khalik

Void Fraction Distribution in Two-Phase Jets for Z-Pinch IFE Reactor Applications, Brian J. Kern, D. L. Sadowski, S. M. Ghiaasiaan, S. I. Abdel-Khalik

Shock Mitigation Studies in Voided Liquids for Fusion Chamber Protection, Virginia L. Vigil, Mark Anderson, Jason Oakley, Riccardo Bonazza, Gary Rochau

Embedded Topical Meeting #1: TOFE

Mean and Multi-Group Opacities of Weakly Non-Ideal Flinabe Plasma, Mofreh R. Zaghloul

Emissivity and Radiative Cooling of Ideal and Weakly Non-Ideal High-Temperature Flinabe Gas, Mofreh R. Zaghloul

Characteristic Evaluation of Mechanical Jointed HTS Cable for Remountable HTS Magnet, Satoshi Ito, Shohei Takami, Yuko Yamamoto, Kazuhisa Yuki, Hidetoshi Hashizume, Akio Sagara

Cooling of QPS Modular Coils Using Embedded Copper Tubes, Shankar Narasimhaswami, Madhu S. Madhukar

Spectral Effects of Activation for Liquid Blanket Relevant Materials Induced by D-T Neutron Irradiation, Zaxin Li, T. Tanaka, T. Muroga, S. Sato, T. Nishitani

Cross Sections for Charge Exchange and Ionization of High Energy Cs⁺ Ions in Noble Gases, Linchun Wu, George H. Miley, Hiromu Momota

Investigating Possible Radiation Damage in Video Cameras for Video Control in the Ports of Wendelstein 7X Stellarator, G. Por, K. Nagy, Sz. Czifrus

Enhancement of First Wall Damage Due to LENR Effects, George H. Miley, Andrei G. Lipson, Hiromu Momota

Experience with Conversion of CAD to Monte Carlo Particle Transport Models, J. F. Latkowski, Ryan P. Abbott, Ray Laning, Steve Manson, Kevin Morris, Susana Reyes, Eric Williams

Compatibility of Low Activation Ferritic Steels with Liquid Lithium, Qi. Xu, T. Nagasaka, T. Muroga

Experimental Study on Corrosion and Mass Transfer in Natural Convection Lithium Loop, Masaru Naguar, Masatoshi Kondo, Akihiro Suzuki, Takeo Muroga, Takayuki Terai

SiC Coating by RF Sputtering as Tritium Permeation Barrier for Fusion Blanket, Zhenyu Yao, Akihiro Suzuki, Takayuki Terai

Measurement of Interface Bond Strength Between Tungsten Coatings and Steel Substrates for HAPL FW Armor, Jaafar A. El-Awady, Hyoung Il Kim, Vijay Gupta, Jennifer Quan, Nasr Ghoniem, Shahram Sharafat

Modeling Space-Time Dependent Helium Bubble Evolution in Tungsten Armor Under IFE Conditions, Qiyang Hu, Shahram Sharafat, Nasr Ghoniem

Study on Chemical Behavior of Energetic Deuterium Implanted into Li₂TiO₃, Makoto Oyaizu, Akira Yoshikawa, Yusuke Nishikawa, Taichi Suda, Takashi Shinozaki, Kenzo Munakata, Yasuhisa Oya, Kenji Okuno

Two-Layer Diffusion Systems with Tungsten Coatings: Possible Use in Fusion Devices, G. P. Glazunov, A. A. Andreev, R. A. Causey, A. M. Hassanein, A. P. Patokin, E. D. Volkov

Molecular Dynamics Simulations of Bubble Formation and Erosion of Metal Surfaces, Z. Insepov, A. Hassanein

Integration of the Modular Dual Coolant Pb-17Li Blanket Concept in the ARIES-CS Power Plant, X.R. Wang, L.A. El-Guebaly, S. Malang, A. R. Raffray, and the ARIES Team

Effects of Tube Milling on Structural Material for ITER Test Blanket Module, Takanori Hirose, Hiroyasu Tanigawa, Milkio Enoeda, Masato Akiba

Development of a Porous-Type Manifold for IFMIF High Flux Test Module, Shinji Ebara, Yasutaka Harai, Hiroshi Irisa, Takehiko Yokomine, Akihiko Shimizu

Helium Implantation Effects on Retention Behavior of Hydrogen Isotopes in Boron Films, A. Yoshikawa, Y. Oya, H. Miyauchi, Y. Nishikawa, T. Nakahata, T. Suda, E. Igarashi, M. Oyaizu, M. Tokitani, H. Iwakiri, N. Yoshida, K. Okuno

Experimental Investigation of Turbulent Heat Transfer of High Prandtl Number Fluid Flow Under the Strong Magnetic Field, T. Yokomine, H. Nakaharai, J. Takeuchi, T. Kunugi, S. Satake, N. B. Morley, M. A. Abdou

Numerical Study of Heat Transfer Characteristics in a Tube with Regularly Spaced Twisted Tape, H. Nakaharai, S. Takami, T. Yokomine, S. Ebara, A. Shimizu

Occupational Injury Rate Estimates in Magnetic Fusion Experiments, L. Cadwallader
Construction Injury Rate Estimates for ITER, L. Cadwallader

Inhibition of Lipid Peroxidation Induced by Tritiated Water Due to Tea Catechins, Masayo Kubota, Hiroyuki Haga, Yuya Takeuchi, Yasuhisa Oya, Kenji Okuno

Activation and Waste Stream Analysis for RTL of Z-Pinch Power Plant, L. El-Guebaly, P. Wilson, M. Sawan

Tritium Control for Flibe/V-Alloy Blanket System, T. Muroga, T. Tanaka, Zaxin Li, A. Sagara, Dai-Kai Sze

Tritium Release Behavior from Steels Irradiated by High Energy Proton, H. Nakamura, K. Kobayashi, S. Yokoyama, S. Saito, T. Yamanishi, K. Kikuchi

PERMCAT Process for the Decontamination of Highly Tritiated Gaseous Mixtures and Liquid Water Produced During Cleaning Phases of Fusion Machines, D. Demange, M. Glugla, S. Welte, B. Bornschein, D. Corneli, T. L. Le, K. H. Simon, K. Günther

Tritium Behavior on the Water-Metal Boundary for the Permeation into Cooling Water Through Metal Piping, T. Hayashi, H. Nakamura, K. Isobe, K. Kobayashi, Y. Toshihiko, K. Okuno

Study for the Behavior of Tritiated Water Vapor on Organic Materials, K. Kobayashi, T. Hayashi, H. Nakamura, T. Yamanishi, Y. Oya, K. Okuno

Self-Decomposition Behavior of High Concentration Tritiated Water, T. Itoh, T. Hayashi, K. Isobe, K. Kobayashi, Y. Toshihiko

Isotope Effect of Hydrogen Rapidly Supplied from the Metal Storage Bed, T. Hayashi, T. Suzuki, W. M. Shu, Y. Toshihiko

Diffusion Characteristics of Hydrogen-Isotopic Water Molecules in Zeolite Crystals, Kenji Kotoh, Kazuhiko Kudo

Oxidation Performance Test of Detritiation System Under Existence of SF₆, K. Kobayashi, H. Miura, T. Hayashi, S. Hoshi, T. Yamanishi

Erbia Coatings Fabricated by PVD Method as a Tritium Permeation Barrier, Akihiro Suzuki, Takuya Handa, Denis Levchuk, Takayuki Terai

Neutral Beam Injector Performance and Availability at JET, F. Sabathier, R. King, M. Cox, T. Jones, D. Ciric, M. de Baar

Pellet Dropper Device for ELM Control on DIII-D, S. K. Combs, L. R. Baylor, J. B. O. Caughman, C. R. Foust, T. C. Jernigan, D. A. Rasmussen

Neutron Source with Counter-Deuterium Beam Linear IEC, George H. Miley, Hiromu Momota

Development and Design of 304L Stainless Steel Couplers for the MIT/PPPL Alcator C-Mod Lower Hybrid Current Drive Experiment, W. Beck, R. Childs, J. Irby, S. Marazita, E. Marmar, R. Parker, P. Koert, D. Terry, R. Vieira, T. Willard, S. Wukitch, D. Gwinn

A Network Based Telemetry Upgrade for the DIII-D Neutral Beam Power Diagnostics, H. K. Chiu, V. Noraky, R.-M. Hong

Removal of Dust from Diagnostic Surfaces Employing a Nd:YAG Laser, Drew Cardwell, C. A. Gentile, C. H. Skinner, S. Langish

Embedded Topical Meeting #1: TOFE

Maintenance Approach for a Fast Ignition ICF Reactor with a Dry Wall Chamber and a High Repetition Laser, R. Hiwatari, Y. Asaoka, K. Okano, S. Mori, H. Yamada, T. Goto, Y. Ogawa

Progress in NCSX Construction, L. Dudek, J. Chrzanowski, P. Heitzenroeder, T. Meighan, S. Raftopoulos, M. Viola

Metrology for the NCSX Project, S. Raftopoulos, B. Stratton, G. Labik, J. Chranowski, M. Viola, M. Duco, M. Zarnstorff, A. Brooks, B. Nelson, M. Cole, T. Brown

Direct Conversion of D-3He Protons Using a Solid-State PIN Junction Diode, David R. Boris, Zhenqiang Ma, Hao-Chih Yuan, Robert P. Ashley, John F. Santarius, Gerald L. Kulcinski

The 500-kA, 100-ns LTD Cavity Has Reached the 0.1Hz Repetition Rate Z-Pinch IFE Goal, William E Fowler, Michael G. Mazarakis, Craig L. Olson, Robin A. Sharpe, Kenneth W. Struve

Laser-Induced Optical Damage Experiments for Neutron-Irradiated Fused Silica, Jeffery F. Latkowski, Ryan P. Abbott, Vernon K. Kanz, Bradley K. Bell

Recombination Dynamics of Free Chlorine with Vaporized Ferritic Steel, Y. Tajima, L. Schmitz, A. Ying, P. Calderoni

Experiments and Computations for ICF-Related Shock-Driven Hydrodynamic Instabilities, Bradley Motl, Devesh Ranjan, John Niederhaus, Jason Oakley, Mark Anderson, Riccardo Bonazza

Surface Roughening Mechanisms for Tungsten Exposed to Laser, Ion, and X-Ray Pulses, Michael Andersen, Nasr M. Ghoniem

Heat Transfer Between Pebbles Considering Large Temperature Gradient Inside Pebble, T. Yokomine, S. Ebara, Y. Tanaka, A. Shimizu

Calculation of the Temperature Field in the First Wall of the HCPB TBM with the Code ANSYS CFX 10.0, Bela Kiss, Attila Aszódi

Comparing the Prediction of Attila Code to the Experimental Data of Fusion Integral Experiments and to the Results of MCNP Code, Mahmoud Z. Youssef, Todd Wareing, Ian M. Davis

Integrated Thermo Fluid-Thermal Stress Analysis Approach for an Effective Design of ITER TBM (Test Blanket Module), Manmeet S. Narula, Alice Ying, Ryan Hunt, Mohamed Abdou

Particle Splitting for Monte Carlo Simulation of the National Ignition Facility, Lucile S. Dauffy, Jeffery F. Latkowski

Heat Transfer and Pressure Drop Experiments Under Smooth and Swirl-Flow Highly Subcooled Boiling Conditions, D. R. Novog, S. T. Yin, J. S. Chang

Low Cost Pyroelectric D-D Fusion Generators, Jeffrey Geuther, Yaron Danon

TUESDAY, NOVEMBER 14, 2006 • 3:00 P.M.

Power Plant Studies, *Chair:* L. El-Guebaly

Dona Ana
3:00 p.m.

Optimization Studies on Conceptual Designs of LHD-Type Reactor FFHR, A. Sagara, O. Mitarai, T. Tanaka, T. Morisaki, S. Imagawa, K. Takahata, H. Tamura, H. Chikaraishi, S. Yamada, T. Goto, Y. Ogawa, S. Fukada, Y. Kozaki, T. Dolan, T. Muroga, T. Mito, O. Motojima, and the FFHR Design Group, invited

3:20 p.m.

Z-Pinch Fusion Driven Systems for IFE, Transmutation, and GNEP, Gary E. Rochau, invited

3:40 p.m.

Conceptual Design of Fast Ignition Power Plant KOYO-F Driven by Cooled Yb:YAG Ceramic Laser, T. Norimatsu, J. Kawanaka, M. Miyanaga, H. Azechi, Y. Kozaki, K. Mima, invited

4:00 p.m.

Axisymmetric Tandem Mirror Magnetic Fusion Energy Power Plant with Thick Liquid-Walls, R. W. Moir, T. D. Rognien

4:15 p.m.

Z-Pinch Chamber Assessment and Design, L. El-Guebaly, M. Sawan, I. Sviatoslavsky, P. Wilson, G. Sviatoslavsky, G. Kulcinski

4:30 p.m.

Liner-Driven Pulsed Magnetized Target Fusion Power Plant, Ronald L. Miller

4:45 p.m.

Engineering Issues Facing Transmutation of Actinides in Z-Pinch Fusion Power Plant, L. El-Guebaly, B. Cipiti, P. H. Wilson, P. Phruksarojanakun, R. Grady, I. Sviatoslavsky, G. Sviatoslavsky, G. Kulcinski

High Heat Flux Components—II, *Chair:* R. Nygren

Galisteo

3:00 p.m.

Edge Transport Control with the Local Island Divertor and Recent Progress in LHD, M. Kobayashi, N. Ohyabu, T. Morisaki, S. Masuzaki, R. Sakamoto, Y. Feng, A. Sagara, A. Komori, O. Motojima, and the LHD Experimental Group, invited

3:20 p.m.

High Heat Flux Materials, Harald Bolt, invited

3:40 p.m.

Design of Low Pressure Drop Tungsten-Foam Heat Exchanger for Ultra High Heat Flux, Shahram Sharafat, Nasr Ghoniem, Brian Williams, Dennis Youchison, Richard Nygren

3:55 p.m.

Microstructure Analysis of Hold-Time Effect on the Fatigue Life of CuCrZr for Fusion Application, Xianglin Wu, Xiao Pan, James F. Stubbins

4:10 p.m.

Critical Heat Flux Characteristics for Subcooled Flow Boiling of R134-a in Hypervapotron, Peipei Chen, Barclay G. Jones

4:25 p.m.

Particle Balance Modeling on Helium Ash Removal from Steady-State DT-Fusion Reactors, Yoshi Hirooka

4:40 p.m.

Laser and Z-Pinch Plasma Devices for Lithography and Similarities to Fusion Problems, A. Hassanein, V. Sizyuk, T. Sizyuk, V. Morozov

Computational Tools and Validation Experiments, *Chair:* T. K. Mau Cimarron

3:00 p.m.

Validation Strategies in MHD Computation for Fusion Application, Ming-Jiu Ni, Ramakanth Munipalli, Neil B. Morley, Peter Huang, Sergey Smolentsev, Shashi Aithal, Alice Ying, Mohamed Abdou, invited

3:20 p.m.

Innovations in Three-Dimensional Neutronics Analysis for Fusion Systems, P. Wilson, T. Tautges, M. Sawan, L. El-Guebaly, D. Henderson, G. Sviatoslavsky, B. Kiedrowski, A. Ibrahim, invited

3:40 p.m.

Effect of Nitrogen Impurities in the Scrape-Off Layer of Magnetically Confined Plasma, G. Kamberov, L. Popova, T. Nickolov, P. Marinov, V. Hristov

3:55 p.m.

Preliminary Modeling of the Toroidal Dust Mobilization Experiment, P. W. Humrickhouse, J. P. Sharpe

4:10 p.m.

Lattice Boltzmann Methods for Magnetohydrodynamic Flows in Fusion Applications, M. J. Pattison, K. N. Premnath, N. B. Morley

4:25 p.m.

Fusion Reaction Product Transport for Magnetized Target Fusion (MTF), Ronald C. Kirkpatrick

Embedded Topical Meeting #1: TOFE

WEDNESDAY • NOVEMBER 15, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 10:00 AM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• In-Vessel Components and Magnets• IFE Drivers• Engineering of Experimental Devices
8:30 AM - 11:30 AM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
8:30 AM - 11:30 AM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)
10:00 AM - 11:30 AM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• Alternate Non-Electric Applications—I• Radwaste Management and Plasma Engineering, Heating and Control• Structural and Breeding Materials
11:30 AM - 1:00 PM	MATERIALS SCIENCE AND TECHNOLOGY (MSTD) AWARDS LUNCHEON
1:00 PM - 3:00 PM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• Alternate Non-Electric Applications—II• Material and Component Test Facilities• Nuclear Analysis and Experiments• Power Plant Studies—ARIES CS—II
1:00 PM - 4:00 PM	NPIC&HMIT 2006 TECHNICAL SESSIONS (see pg 41)
1:00 PM - 4:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)
3:00 PM - 5:00 PM	TOFE 2006 TECHNICAL SESSIONS <ul style="list-style-type: none">• IFE Chamber Dynamics and Clearing• Blanket Testing and Safety and Environment• Diagnostics• Tritium Handling and Processing—II
4:30 PM - 6:30 PM	NPIC&HMIT 2006 SPECIAL SESSION: "GNEP — I&C Issues—Panel"
6:50 PM - 10:00 PM	EVENING EVENT: Dinner at El Pinto Restaurant
7:00 PM - 9:00 PM	PUBLIC INFORMATION WORKSHOP: "Focus on Communications: Speaking to the Media"

WEDNESDAY, NOVEMBER 15, 2006 • 8:00 A.M.

In-Vessel Components and Magnets, Chair: N. Taylor

Dona Ana

8:00 a.m.

Novel Insulation Systems for Fusion Magnets, R. Prokopec, K. Humer, H. W. Weber

8:15 a.m.

Neutronics Analysis of a Self-Cooled Blanket for a Laser Fusion Plant with Magnetic Diversion, M. E. Sawan, C. S. Aplin, G. Sviatoslavsky, I. N. Sviatoslavsky, A. R. Raffray

8:30 a.m.

Absorption of Neutral Hydrogen Atoms by Vanadium Panel, Yuji Hatano, Andrei Busnyuk, Alexander Livshits, Yukio Nakamura, Masao Matsuyama

8:45 a.m.

Ion Deflection for Final Optics in Laser Inertial Fusion Power Plants, Ryan P. Abbott, Jeffery F. Latkowski

9:00 a.m.

Incorporation of Hydrogen in Carbon-Tungsten Co-Deposition Layers Formed by Hydrogen Plasma Sputtering, K. Katayama, T. Okamura, K. Imaoka, M. Sasaki, Y. Uchida, S. Fukada, M. Nishikawa

9:15 a.m.

Oxidation of Carbon Deposition Layers Formed by Hydrogen Plasma Sputtering, T. Okamura, K. Katayama, Y. Uchida, M. Nishikawa, S. Fukada

IFE Drivers, Chair: G. Rochau

Galisteo

8:00 a.m.

The Mercury Project: A High Average Power, Gas-Cooled Laser for Inertial Fusion Energy Development, A. Bayramian, P. Armstrong, E. Ault, R. Beach, C. Bibeau, J. Caird, R. Campbell, J. Dawson, C. Ebberts, A. Erlandson, B. Freitas, R. Kent, Z. Liao, T. Ladran, J. Menapace, B. Molander, S. Payne, N. Peterson, K. Schaffers, S. Sutton, J. Tassano, S. Telford, E. Utterback, invited

8:20 a.m.

Development of a Continuous Multi-Thousand Shot Electron Beam Pumped KrF Rep-Rate Laser for Fusion Energy, P. M. Burns, M. Myers, J. D. Sethian, M. F. Wolford, J. L. Giuliani, R. H. Lehmborg, S. Searles, M. Friedman, F. Hegeler, R. Jaynes, invited

8:40 a.m.

Sandia High Current High Voltage Z-Pinch IFE Driver Program, Michael G. Mazarakis, Alexander A. Kim, William E. Fowler, Craig L. Olson, Robin A. Sharpe, Kenneth W. Struve, invited

9:00 a.m.

Power Flow Design Constraints for a Recyclable Transmission Line for Z-Pinch IFE, J. W. Schumer, P. F. Ottinger, C. L. Olson

9:15 a.m.

Investigation of Mist Cooling for the Electra KrF Laser Hibachi, V. Novak, S. I. Abdel-Khalik, D. L. Sadowski, K. G. Schoonover

9:30 a.m.

Driver Transition Geometries and Inductance Considerations Leading to Design Guidelines for a Z-IFE Power Plant, David L. Smith, Michael G. Mazarakis, Craig L. Olson

9:45 a.m.

Nuclear Assessment of Final Optics of a KrF Laser Driven Fusion Power Plant, M. E. Sawan, M. McGeoch, A. Ibrahim, P. Wilson

Engineering of Experimental Devices, Chair: J. Latkowski

Cimarron

8:00 a.m.

Rationale and Plans for a Laser-Based Fusion Test Facility, Steve Obenschain, John Sethian, invited

8:20 a.m.

Superconducting Tokamak JT-60SA Project for ITER and DEMO Researches, Nobuyuki Hosogane, JT-60SA Design Team, Japan-Europe Satellite Tokamak Working Group, invited

8:40 a.m.

The EAST Superconducting Tokamak Device and Its Commissioning, Songtao Wu and the EAST Machine Team, invited

9:00 a.m.

Upgrades Completed at the DIII-D Facility During the Long Torus Opening in FY05-06, J. F. Tooker, DIII-D Team

9:15 a.m.

Design Innovations in the QPS Project, J. F. Lyon, B. E. Nelson, R. D. Benson, P. J. Fogarty, K. D. Freudenberg, M. Madhukar

9:30 a.m.

Engineering and Construction of the Lithium Tokamak Experiment, T. Kozub, R. Majeski, R. Kaita, C. Priniski, L. Zakharov

WEDNESDAY, NOVEMBER 15, 2006 • 10:00 A.M.

Alternate Non-Electric Applications—I, Chair: B. Cipiti

Dona Ana

10:00 a.m.

Research and Development on Humanitarian Landmine Detection System by Use of a Compact D-D Fusion Neutron Source, K. Yoshikawa, K. Masuda, T. Takamatsu, E. Hotta, K. Yamauchi, S. Shiroya, T. Misawa, Y. Takahashi, M. Onishi, H. Osawa

10:15 a.m.

Detection of Highly Enriched Uranium Using a Pulsed D-D Fusion Source, R. F. Radel, G. L. Kulcinski, R. P. Ashley, J. F. Santarius, G. R. Piefer, D. R. Boris, R. Giar, B. Egle, C. Seyfert, S. J. Zenobia, E. Alderson

10:30 a.m.

Improvement of Discharge Stability on Inertial Electrostatic Confinement Fusion Device, Hodaka Osawa, Masami Ohnishi, Tomoya Furukawa, Takashi Suma, Teruhisa Takamatsu, Kai Masuda, Kiyoshi Yoshikawa

10:45 a.m.

Comparison of Spherical and Cylindrical Cathode Geometries in Inertial Electrostatic Confinement Fusion Devices, Brian Egle, John F. Santarius, Gerald L. Kulcinski

Embedded Topical Meeting #1: TOFE

11:00 a.m.

Development of a Time-Independent Particle-In-Cell Code for Simulating DC Discharges in Inertial Electrostatic Confinement Devices, Kai Masuda, Kiyoshi Yoshikawa

11:15 a.m.

Neutron Production Rate of Inertial Electrostatic Confinement Fusion Device with Fusion Reaction on Surface of Electrodes, Kazuyuki Noborio, Yasushi Yamamoto, Satoshi Konishi

Radwaste Management and Plasma Engineering, Heating, and Control, *Chair: M. Ulrickson*

Galisteo

10:00 a.m.

Plasma Surface Interaction Issues of an All-Metal ITER, J. N. Brooks, J. P. Allain, R. Doerner, A. Hassanein, T. Rognlien, invited

10:20 a.m.

NSTX Plasma Start-Up Using Transient CHI, D. Mueller, R. Raman, M. G. Bell, T. R. Jarboe, R. Maqueda, B. A. Nelson

10:35 a.m.

The ITER NB Injector Test Facility: Analyses of the Impact on the High Voltage Grid, R. Piovan, A. De Lorenzi, E. Gaio, F. Milani, L. Novello

10:50 a.m.

Rotation of a Neutral Beamline to Obtain Counter-Injection on the DIII-D Tokamak, J. T. Scoville

11:05 a.m.

Environmental Benefits and Impact of the Radwaste Management Approaches: Disposal, Recycling, and Clearance, L. El-Guebaly

Structural and Breeding Materials, *Chair: S. Zinkle*

Cimarron

10:00 a.m.

Overview of the U.S. ITER Test Blanket Program, Mohamed Abdou, U.S. ITER TBM Team, invited

10:20 a.m.

Japan-U.S. Collaborative Program on Fusion Materials/Engineering; JUPITER-II, Current Status and the Future, A. Kohyama, K. Abe, S. Tanaka, G. Nardella, S. J. Zinkle, Dai-Kai Sze, invited

10:40 a.m.

Compatibility Issues for a High Temperature Dual Coolant Blanket, B. A. Pint

10:55 a.m.

Long Term Corrosion Test on JLF-1 JOYO-II Heat in High Purity Flibe, Takuya Nagasaka, Masatoshi Kondo, Hidetoshi Nishimura, Tomoyoshi Yakata, Nobuaki Noda, Takeo Muroga, Akio Sagara, Akihiro Suzuki, Takayuki Terai

11:10 a.m.

Beryllium Implemented Redox Control for Ferritic Steel in Flibe, Galen Smolik, Michael Simpson, Hidetoshi Nishimura, Phil Sharpe, David Petti, Patrick Calderoni

11:25 a.m.

Thermal Helium Desorption of Helium-Implanted Iron, Brian D Wirth, Donghua Xu

11:40 a.m.

Development of Fe-Base ODS Alloys for Fusion Application, Jinsung Jang, Chang Soo Bae, Yin Zhong Shen, Do Hyang Kim

WEDNESDAY, NOVEMBER 15, 2006 • 1:00 P.M.

Alternate Non-Electric Applications—II, *Chair: I. Yamamoto*

Dona Ana

1:00 p.m.

Transmutation of Actinides Using Z-Pinch Fusion, B. B. Cipiti, P. P. H. Wilson, P. Phruksarojanakun, L. A. El-Guebaly, invited

1:20 p.m.

Sub-Critical Transmutation Reactors with Tokamak Neutron Sources Based on ITER Physics and Technology, W. M. Stacey, invited

1:40 p.m.

Isotopic Analysis of the *In-Zinerator* Actinide Management System, P. Phruksarojanakun, P. P. H. Wilson, B. B. Cipiti, R. Grady, invited

2:00 p.m.

Tokamak Fusion Neutron Source for a Fast Transmutation Reactor, J.-P. Floyd, S. M. Jones, M. Kato, J. C. Schultz, B. H. Shrader, J. B. Weathers, W. M. Stacey, Z. W. Friis, R. W. Johnson

2:15 p.m.

Parametric Analysis of Z-Pinch Driven Nuclear Waste Incineration System, Avery Guild-Bingham, Pavel Tsvetkov, B. Cipiti

2:30 p.m.

An Integrated Broad Area Coverage Fusion Neutron/X-Ray Interrogation Unit, G. H. Miley, P. J. Shrestha, H. Momota, L. Wu

2:45 p.m.

Development of Convergent D-D Fusion Neutron Generator with Large Pulse Current, Masami Ohnishi, Osawa Hodaka, Tomoya Furukawa, Takashi Suma

Material and Component Test Facilities, *Chair: L. Waganer*

Galisteo

1:00 p.m.

Recent Progress in the U.S. Program to Develop Low-Activation Structural Materials for Fusion, Richard J. Kurtz, invited

1:20 p.m.

Performance Limits for SiC and SiC Composites as Fusion Structural Materials, L. L. Snead, Y. Katoh, A. Kohyama, invited

1:40 p.m.

Generation of X-Ray and Ion Threat Spectra for the Fusion Test Facility Using the BUCKY 1-D Radiation Hydrodynamics Code, T. A. Heltemes, G. A. Moses

1:55 p.m.

Exposure of First-Wall Materials to Energetic Ions on RHEPP-1 for Laser IFE Applications, T. J. Renk, P. P. Provencio, T. J. Tanaka, C. L. Olson

2:10 p.m.

Evaluation of Advanced Materials for Liquid Li-Pb Blanket Environment, Satoshi Niigawa, Yukihisa Ueno, Mikio Enoeda, Tatsuya Hinoki, Joon-soo Park, Yasushi Yamamoto, Satoshi Konishi

2:25 p.m.

Numerical Simulation of Turbulent Flow and Heat Transfer in a Cooling Channel of IFMIF High Flux Test Module, Shinji Ebara, Hiroyuki Nakahara, Takehiko Yokomine, Akihiko Shimizu

Nuclear Analysis and Experiments, *Chair: T. Nishitani*

Cimarron

1:00 p.m.

Three-Dimensional Nuclear Assessment for the Chamber of Z-Pinch Power Plant, M. Sawan, L. A. El-Guebaly, P. Wilson, invited

1:20 p.m.

Neutron Radiation Shielding for the NIF Streaked X-Ray Detector (SXD) Diagnostic, Peter Song, Joe Holder, Bruce Young, Dan Kalantar, David Eder, Joe Kimbrough, invited

1:40 p.m.

Progress in Neutronics Studies for the Water-Cooled Pebble Bed Blanket, Takeo Nishitani, Satoshi Sato, Kentaro Ochiai, Chikara Konno

1:55 p.m.

Neutronics Analysis of the Diagnostic Equatorial and Upper Port Plug Blanket Modules of ITER Using MCNP-4C2 Code System, Gabriel Farkas, Vladimir Slugen, Martin Zavodsky, Roman Vrbovsky

2:10 p.m.

Activation Analysis for Sequential Reactions of a Fusion Demo-Reactor, Michinori Yamauchi, Takeo Nishitani, Jun-ichi Hori, Hiromitsu Kawasaki

Embedded Topical Meeting #1: TOFE

2:25 p.m.

Activation and Radiation Damage Behavior of Russian Structural Materials for Fusion Reactors in the Fission and Fusion Reactors, A. I. Blokhin, V. M. Chernov, N. A. Demin, M. V. Leon'eva-Smirnova, M. M. Potapenko

2:40 p.m.

Measurement of Neutron Spectra and Tritium Production Rates in an ITER TBM Mock-Up Irradiated with 14 MeV Neutrons, A. Klix, P. Batistoni, U. Fischer, H. Freiesleben, D. Leichtle, K. Seidel, S. Unholzer

Power Plant Studies—ARIES CS—II, *Chair:* G. Kulcinski

Aztec

1:00 p.m.

Design Approach for ARIES Compact Stellarator, Lester M. Waganer, ARIES Team, invited

1:20 p.m.

Overview of ARIES-CS In-Vessel Components: Integration of Nuclear, Economic, and Safety Constraints in Compact Stellarator Design, L. A. El-Guebaly, R. Raffray, S. Malang, J. Lyon, L. P. Ku, X. Wang, P. Wilson, D. Henderson, T. Tautges, M. Sawan, G. Sviatoslavsky, B. Kiedrowski, M. Wang, L. Bromberg, C. Martin, B. Merrill, L. Waganer, F. Najmabadi, ARIES Team, invited

1:40 p.m.

Configuration Optimization and Physics Basis for ARIES-CS, L. P. Ku, ARIES Team

1:55 p.m.

Coil Structural Design and Magnetic-Structural Analysis of the ARIES-CS Coil System, X. R. Wang, S. Malang, C. Martin, A.R. Raffray, ARIES Team

2:10 p.m.

MHD Analysis of Dual Coolant Pb-17Li Blanket for ARIES-CS, C. Mistrangelo, A.R. Raffray, ARIES Team

2:25 p.m.

Divertor Configuration and Heat Load Distribution for a Compact Stellarator Reactor, T. K. Mau, H. McGuinness, A. A. Grossman, A. R. Raffray, X. R. Wang, D. Steiner, ARIES Team

WEDNESDAY, NOVEMBER 15, 2006 • 3:00 P.M.

IFE Chamber Dynamics and Clearing, *Chair:* R. Peterson

Dona Ana

3:00 p.m.

Laser Fusion Chamber Design, James Blanchard, Rene Raffray, invited

3:20 p.m.

Investigation of Argon and Xenon as Potential Shock Attenuators in Z-IFE Chambers Using ALEGRA, Sal B. Rodriguez, Jason Cook

3:35 p.m.

Simple Models for the Dynamic Response Associated with IFE Shock Mitigation, R. J. Lawrence, L. C. Chhabildas

3:50 p.m.

Experimental Investigation of Z-Pinch IFE Chamber Liquid Structure Response, Per F. Peterson, Philippe M. Bardet, Haihua Zhao, Ryan P. Abbott

4:05 p.m.

Thermal Analysis of Candidate Armor Materials for Use in the Magnetic Cusp Field HAPL Reactor Design, T. A. Heltemes, G. A. Moses

4:20 p.m.

Effect of Different IFE Chamber Gases and Pre-Ignition Conditions on Target Survival and Trajectory, Zoran Dragojlovic, Farrokh Najmabadi

Blanket Testing and Safety and Environment, *Chair:* M. Abdou

Galisteo

3:00 p.m.

Power Supply Reliability Estimates for Experimental Fusion Facilities, L. C. Cadwallader, T. Pinna, P. I. Petersen, invited

3:20 p.m.

Updated Accident Consequence Analyses for ITER at Cadarache, Neill P. Taylor, invited

3:40 p.m.

Safety Analysis of the U.S. Helium Cooled Pebble Bed Ceramic Breeder ITER Test Blanket Submodule, Susana Reyes, Brad J. Merrill, Alice Ying

3:55 p.m.

Characterization of Dust Collected from DIII-D, J. P. Sharpe, W. P. West, C. Wong, C. Breckenridge, D. Bruhn, A. Miller

4:10 p.m.

Recent Progress in Solid Breeder Blanket Development at JAEA, T. Nishitani, M. Enoda, M. Akiba, T. Yamanishi, K. Hayashi, H. Tanigawa, invited

4:30 p.m.

Calculation and Experiment to Recover Tritium from Flibe Blanket in Helical Reactor, Satoshi Fukada, Akio Morisaki, Kazunari Katayama, Akio Sagara

Diagnostics, *Chair:* M. Mazarakis

Cimarron

3:00 p.m.

Diagnostic Developments for the DIII-D National Fusion Facility, R. L. Boivin, DIII-D Team, invited

3:20 p.m.

On a Possibility of Energetic Particle Diagnostics Based on γ -Ray Measurement, Y. Nakao, M. Nakamura, V. T. Voronchev

3:35 p.m.

Design and Operation of a Six-Color Fast Optical Pyrometer, Jeffery F. Latkowski, Ryan P. Abbott, Bradley K Bell, Vernon K. Kanz

3:50 p.m.

Investigation of MHD Phenomena in NSTX Using a Fast Soft X-Ray Imaging Camera, C. E. Bush, B. C. Stratton, J. Robinson, L. E. Zakharov, E. Fredrickson, D. Stutman, K. Tritz

4:05 p.m.

Investigation of ${}^3\text{He}({}^3\text{He},2p){}^4\text{He}$ Reactions in an IEC Device, Gregory R. Piefer, John F. Santarius, Robert P. Ashley, Gerald L. Kulcinski

4:20 p.m.

Development of Excited Helium Beam Injector for Electric Field Measurement by Laser-Induced Fluorescence Method, Tetsuya Nishi, Kei Yoneda, Kai Masuda, Kiyoshi Yoshikawa

Tritium Handling and Processing—II, *Chair:* L. Cadwallader

Aztec

3:00 p.m.

Review of the ITER Inner Fuel Cycle Design and Future R&D, M. Glugla, A. Antipenkov, S. Beloglazov, C. Caldwell-Nichols, L. R. Cristescu, I. Cristescu, C. Day, D. Murdoch, invited

3:20 p.m.

Tritium Inventories Within the ITER Fuel Cycle Systems in Various Operational Scenarios, I.R. Cristescu, I. Cristescu, M. Glugla, D. Murdoch, invited

3:40 p.m.

Fusion Power Plant Tritium Production and Recovery, Rodney L. Keith

3:55 p.m.

Fusion Test Facility (FTF) Target Chamber Tritium Recovery, Processing and Purification System, C.A. Gentile, T. Kozub, S. Langish, C. Priniski, L. Ciebiera

4:10 p.m.

Effects of Tritium on UHMW-PE, PTFE, and Vespel[®] Polyimide, Elliot A. Clark, Kirk L. Shanahan

4:25 p.m.

Tritium Effects on Weldment Fracture Toughness of Type 304L Stainless Steel, Michael J. Morgan, Michael H. Tosten, Scott L. West

Embedded Topical Meeting #2: NPIC&HMIT 2006

5th International Topical Meeting on Nuclear Plant Instrumentation, Controls, and Human Machine Interface Technology (NPIC&HMIT 2006)

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SESSIONS BY TRACK

Opening Plenary (Monday 2:45 – 5:00 p.m.)

Special Session: GNEP – I&C Issues–Panel (Wednesday 4:30 – 6:30 p.m.)

TRACK 1: SYSTEMS

Digital System Reliability—I (Tues. a.m.)
Digital System Reliability—II (Tues. p.m.)
Control Systems (Wed. a.m.)
I&C Architecture Approaches (Wed. a.m.)
Digital I&C Technology (Thurs. a.m.)

TRACK 2: HARDWARE AND COMMUNICATIONS

Advanced Sensors and Measurement Techniques—I (Tues. a.m.)
Advanced Sensors and Measurement Techniques—II (Tues. p.m.)
Cyber-Security and Wireless Applications—I (Wed. a.m.)
Cyber-Security and Wireless Applications—II (Wed. p.m.)
Aging and Environmental Compatibility (Thurs. a.m.)
Wireless Communications Technology (Thurs. p.m.)

TRACK 3: TECHNIQUES

Reactor Noise Analysis (Tues. a.m.)
Advanced Signal Processing Methods for Reactor Monitoring (Tues. p.m.)
Diagnostics and Predictive Maintenance—I (Wed. a.m.)
Diagnostics and Predictive Maintenance—II (Wed. p.m.)
Diagnostics and Prognostics (Thurs. a.m.)
Digital Platforms and Tools (Thurs. p.m.)

TRACK 4: FUTURE AND APPLICATIONS

Education of NPP I&C Professionals (Tues. a.m.)
GEN IV and Research Reactor I&C (Tues. p.m.)
Applications of Next Generation I&C Systems (Wed. a.m.)
Serpoints (Thurs. a.m.)
Lessons Learned in Digital Upgrades (Wed. p.m.)
ICHMI Startup Experience at New Facilities–Panel (Thurs. p.m.)

TRACK 5: QUALIFICATION AND REGULATION

Safety Critical Software System Development and Qualification (Tues. a.m.)
Digital Upgrade and Qualification Issues in an Evolving Regulatory Environment (Tues. p.m.)
Licensing Issues for Advanced I&C Technologies (Wed. a.m.)
Current Regulatory Challenges for I&C (Wed. p.m.)
Digital I&C Design, Development, and Assessment (Thurs. a.m.)
Software Quality Assurance (Thurs. p.m.)

TRACK 6: ADVANCES IN HUMAN-SYSTEM INTERFACES

Advances in Control Room Design, Modernization, and Maintenance (Tues. a.m.)
User Interaction with Automation (Tues. p.m.)
Visualization Technology to Support Decision-Making and Other Activities (Wed. a.m.)
Computerized Procedure Systems (Wed. a.m.)
Designing Better Alarm Systems (Wed. p.m.)
Computerized Operator Decision and Support Systems (Thurs. a.m.)
New HMI Technology (Thurs. p.m.)

TRACK 7: HFE DESIGN AND EVALUATION: APPROACHES, METHODS, AND TOOLS

Knowledge Capture and Engineering (Tues. p.m.)
Function-Based Approaches to Control Room Design (Wed. a.m.)
HFE Design and Analysis Tools—I (Wed. p.m.)
Virtual Reality: Applications and Issues (Wed. p.m.)
HFE Design and Analysis Tools—II (Thurs. a.m.)
Advances and Challenges in HRA (Thurs. a.m.)
Approaches to HFE Verification and Validation (Thurs. p.m.)

TRACK 8: HMIT OPERATIONAL CONSIDERATIONS

Regulatory Challenges and Approaches to Advanced Systems–Panel (Tues. a.m.)
Innovative Approaches to Training and Training Technologies (Tues. a.m.)
Regulatory Oversight and Involvement in Safety Culture–Panel (Tues. p.m.)

Embedded Topical Meeting #2: NPIC&HMIT 2006

CONDENSED SCHEDULE

ROOM	MONDAY NOVEMBER 13TH	TUESDAY NOVEMBER 14TH		WEDNESDAY NOVEMBER 15TH			THURSDAY NOVEMBER 16TH	
	2:45-5:30 PM	8:30-11:30 AM	1:00-4:00 PM	8:30-11:30 AM	1:00-4:00 PM	4:30-6:30 PM	8:30-11:30 AM	1:00-4:00 PM
Ballroom A	Opening Plenary	Advances in Control Room Design, Modernization, and Maintenance	User Interaction with Automation	Visualization Technology to Support Decision-Making and Other Activities	Designing Better Alarm Systems	GNEP: I&C Issues—Paper/Panel	Computerized Operator Decision and Support Systems	
Ballroom B		Regulatory Challenges and Approaches to Advanced Systems—Panel	Regulatory Oversight and Involvement in Safety Culture—Panel	Computerized Procedure Systems	HFE Design and Analysis Tools—I		HFE Design and Analysis Tools—II	
La Cienega		Digital System Reliability—I	Digital System Reliability—II	Controls Systems	I&C Architectural Approaches		Digital I&C Technology	Wireless Communications Technology
Mesilla		Advanced Sensors and Measurement Techniques—I	Advanced Sensors and Measurement Techniques—II	Cyber-Security and Wireless Applications—I	Cyber-Security and Wireless Applications—II		Aging and Environmental Compatibility	Digital Platforms and Tools
Pecos		Reactor Noise Analysis	Advanced Signal Processing Methods for Reactor Monitoring	Diagnostics and Predictive Maintenance—I	Diagnostics and Predictive Maintenance—II		Diagnostics and Prognostics	Software Quality Assurance
Ruidoso		Education of NPP I&C Professionals	Gen IV and Research Reactor I&C	Applications of Next Generation I&C Systems	Current Regulatory Challenges for I&C		Setpoints	ICHMI Startup Experience at New Facilities—Panel
San Miguel		Safety Critical Software System Development and Qualification	Digital Upgrade and Qualification Issues in an Evolving Regulatory Environment	Licensing Issues for Advanced I&C Technologies	Lessons Learned in Digital Upgrades		Digital I&C Design, Development and Assessment	New HMI Technology
Tijeras		Innovative Approaches to Training and Training Technologies	Knowledge Capture and Engineering	Function-Based Approaches to Control Room Design	Virtual Reality: Applications and Issues		Advances and Challenges in HRA	Approaches to HFE Verification and Validation

SESSIONS BY DAY

MONDAY • NOVEMBER 13, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
7:45 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY – CONTINENTAL BREAKFAST [Sponsored by EnergySolutions (We're Part of the Solution)]
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	2006 ANS WINTER MEETING OPENING PLENARY "Ensuring the Future in Times of Change: Nonproliferation and Security"
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: "Sandia Peak Tram/Artesian Winery"
11:30 AM - 6:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	ATTENDEE LUNCHEON IN THE ANS NUCLEAR TECHNOLOGY EXPO
1:00 PM - 2:45 PM	ANS PRESIDENT'S SPECIAL SESSION "Perspectives on the Global Nuclear Energy Partnership"
2:45 PM - 5:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
2:45 PM - 5:30 PM	NPIC&HMIT 2006: OPENING PLENARY SESSION
3:00 PM - 5:30 PM	TOFE 2006: OPENING PLENARY SESSION: "Fusion Energy Program Overviews"
4:30 PM - 6:00 PM	RECEPTION IN THE ANS NUCLEAR TECHNOLOGY EXPO
6:50 PM - 10:00 PM	EVENING EVENT: "Reception at the National Atomic Museum" (Cosponsored by Lockheed Martin on behalf of Sandia National Laboratories)

MONDAY, NOVEMBER 13, 2006 • 2:45 P.M.

Opening Plenary

Ballroom A

SPEAKERS:

- Commissioner Peter Lyons (*U.S. NRC*)
- Clint Williamson (*U.S. Senate Committee on Energy and Natural Resources*)
- Osvald Glockler (*IAEA*)
- Glen Watford (*GE Nuclear Energy*)
- Jay Thayer (*Nuclear Energy Institute*)

TUESDAY • NOVEMBER 14, 2006

7:30 AM - 5:00 PM	MEETING REGISTRATION
8:00 AM - 10:00 AM	SPOUSE/GUEST HOSPITALITY
8:00 AM - 11:30 AM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
8:30 AM - 11:30 AM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
8:30 AM - 11:30 AM	NPIC&HMIT 2006 TECHNICAL SESSIONS • Digital System Reliability—I • Advanced Sensors and Measurement Techniques—I • Reactor Noise Analysis • Education of NPP I&C Professionals • Safety Critical Software System Development and Qualification • Advances in Control Room Design, Modernization, and Maintenance • Regulatory Challenges and Approaches to Advanced Systems—Panel • Innovative Approaches to Training and Training Technologies
9:30 AM - 2:30 PM	SPOUSE/GUEST TOUR: "Sante Fe"
10:00 AM - 2:00 PM	ANS NUCLEAR TECHNOLOGY EXPO
11:30 AM - 1:00 PM	HONORS AND AWARDS LUNCHEON
1:00 PM - 3:00 PM	TOFE 2006 POSTER SESSION (see pg 32)
1:00 PM - 4:00 PM	2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 12)
1:00 PM - 4:00 PM	NPIC&HMIT 2006 TECHNICAL SESSIONS • Digital System Reliability—II • Advanced Sensors and Measurement Techniques—II • Advanced Signal Processing Methods for Reactor Monitoring • Gen IV and Research Reactor I&C • Digital Upgrade & Qualification Issues in an Evolving Regulatory Environment • User Interaction with Automation • Regulatory Oversight and Involvement in Safety Culture—Panel • Knowledge Capture and Engineering
3:00 PM - 5:00 PM	TOFE 2006 TECHNICAL SESSIONS (see pg 32)
4:00 PM - 6:00 PM	GENERAL CHAIR'S SPECIAL SESSION: "Nonproliferation and Security"
6:00 PM - 9:00 PM	NPIC&HMIT 2006 BANQUET (Cosponsored by INVENSYS)
6:00 PM - 9:00 PM	TOFE 2006 BANQUET (Cosponsored by Sandia National Laboratories)

Embedded Topical Meeting #2: NPIC&HMIT 2006

TUESDAY, NOVEMBER 14, 2006 • 8:30 A.M.

Digital System Reliability—I. Chair: Gary Johnson (LLNL)

LaCienega

8:30 a.m.

Evaluations of NPP I&C Functional Safety Measures, Mikhail A. Yastrebenetsky, Leonid I. Spector, Olga N. Butova, Alexander L. Klevtsov, Vladislav V. Inushev (SSTC NRS)

9:00 a.m.

A Method for Calculating Expected Failure Frequency of Digital Control Systems with Redundancies, Man Cheol Kim, Seung-Cheol Jang (KAERI)

9:30 a.m.

Comparison of the Unavailability Using FT Model and Markov Model of SDS1, Sungwhan Cho, Jin Jiang (Univ of Western Ontario)

10:00 a.m.

A Review of Software-Induced Failure Experience, T. L. Chu, G. Martinez-Guridi, M. Yue, J. Lehner (BNL)

10:30 a.m.

Development of Evaluation Method for Software Hazard Identification Techniques, Hui-Wen Huang (Natl Tsing Hua Univ/INER), Ming-Huei Chen (INER), Chunkuan Shih (Natl Tsing Hua Univ), Swu Yih (Ching Yun Univ), Chheng-Tsong Kuo, Li-Hsin Wang, Yuan-Chang Yu, Chung-Wei Chen (INER)

Advanced Sensors and Measurement Techniques—I. Cochairs:

Roger Kisner (ORNL), Bob Felder (Optical Techniques)

Mesilla

8:30 a.m.

Emerging Sensor and I&C Technologies for Nuclear Power Plants, Kofi Korsah, R. T. Wood, Eva Freer (ORNL), Christina Antonescu (NRC)

9:00 a.m.

Novel, Fiber Optic, Hybrid Pressure and Temperature Sensor Designed for High-Temperature Gen-IV Reactor Applications, Matthew E. Palmer, Robert S. Fielder, Matthew A. Davis (Luna Innovations)

9:30 a.m.

Primary Plant Performance Evaluation and Plant Signals Validation, Sergey S. Anikanov (Westinghouse), Igor V. Stolyetnij, Yuriy P. Semenovski (Weston)

10:00 a.m.

Integral Reactivity Measurement: A Multi-Detector Integrated Concept for Nuclear Instrumentation Systems- Description and Results, Jean-Pierre Burel (Data Syst & Solutions)

Reactor Noise Analysis. Chair: Osvald Glockler (IAEA)

Pecos

8:30 a.m.

Development of On-Line Monitoring System for Nuclear Power Plant (NPP) Using Neuro-Expert, Noise Analysis, and Modified Neural Networks, Muhammad Subekti (Kyushu Univ/Natl Nuclear Energy Agency of Indonesia), Tomio Ohno, Kazuhiko Kudo (Kyushu Univ), Kunihiko Nabeshima, Kuniyoshi Takamatsu (IAEA)

9:00 a.m.

Determination of the Fuel Heat Transfer Dynamics via CFD for the Purpose of Noise Analysis, Christophe Demazière, Håkan Mattsson (Chalmers Univ of Technol)

9:30 a.m.

Numerical Tools Applied to Power Reactor Noise Analysis, Christophe Demazière, Imre Pázsit (Chalmers Univ of Technol)

10:00 a.m.

Evaluation of Long Term Neutron Noise Measurements, Sándor Lipcsei, Sándor Kiss (KFKI Atomic Energy Resch Inst), Gábor Kiss (Paks Nuclear Power Plant)

10:30 a.m.

Reactor Noise Analysis Applications in NPP I&C Systems, Osvald Glöckler (IAEA)

Education of NPP I&C Professionals. Chair: Leonard Bond (INL)

Ruidoso

8:30 a.m.

Mentoring Among Scientists: Implications of Interpersonal Relationships within a Formal Mentoring Program, Bryan D. Maughan (Univ of Idaho)

9:00 a.m.

Addressing the Workforce Pipeline Challenge, Leonard Bond, Kevin Kostelnik, Richard Holman (INL)

9:30 a.m.

Partnership for Electrical Generation Technology Education, R. Scott Rasmussen, Lawrence Beaty (Idaho State Univ), Richard Holman (INL)

10:00 a.m.

Nuclear I&C Research and Education under UNENE Program, Jin Jiang (Univ of Western Ontario)

10:30 a.m.

Design Engineer Perceptions and Attitudes Regarding Human Factors Applications to Nuclear Power Plant Design, Ruiqi Ma, Jeffrey M. Jones (AREVA NP)

11:00 a.m.

EPRI Training to Support Digital Upgrades in Nuclear Plants, Ray Torok, Joseph Naser (EPRI)

Safety Critical Software System Development and Qualification.

Cochairs: Atoosa P-J Thunem (HRP), Kee Choon Kwon (KAERI)

San Miguel

8:30 a.m.

Fault Tree Synthesis for Software Design Analysis of PLC Based Safety-Critical Systems, Seo-Ryong Koo, Chang-Ho Cho (Doosan Heavy Industries & Construction Co.), Poong-Hyun Seong (KAIST)

9:00 a.m.

Safety Critical Software Development and Qualification Feedback of Experience from a Digital Safety I&C Designer, Claude Esmenjaud, Hubert Daviau (Data Syst and Solutions)

9:30 a.m.

Quantitative Safety Assessment of Computer Based I&C Systems via Modular Markov Analysis, Carl R. Elks, Yangyang Yu, Barry W. Johnson (Univ of Virginia)

10:00 a.m.

Safety Critical Software Development Qualification, Joseph E. Marron (Invensys Process Syst)

Advances in Control Room Design, Modernization, and Maintenance. Chair: J. Persensky (NRC)

Ballroom A

8:30 a.m.

Human Factors Aspects of Nuclear Power Plant Upgrades in Korea, Jung-Woon Lee, Yong-Hee Lee, Hyun-Chul Lee, Daeho Kim (KAERI), Tong-Il Jang (GNP Syst)

9:00 a.m.

Evaluation of Mental Workload on Digital Maintenance Systems in Nuclear Power Plants, Sheue-Ling Hwang (Natl Tsing Hua Univ), Fei-hui Huang (Diwan College of Management), Jih-Cong, Guo-Feng Liang (Natl Tsing Hua Univ), Tzu-Chung Yenn, Chong-Cheng Hsu (INER)

9:30 a.m.

A Computerized Main Control Room for NPP: Development and Investigation, Alexey N. Anokhin (Obninsk State Technical Univ for Nuclear Power Engineering), Edward C. Marshall (Synergy Consultants), Igor D. Rakitin (Kurchatov Inst), Vladimir M. Slonimsky (Leningrad Nuclear Power Plant)

10:00 a.m.

Action-Centered Display Design: Observations and Conclusions to HMI by Applying Digital I&C in Main Control Rooms, Clemens Treier, Kurt Zeck, Alfred Weich, Reinhard Schildheuer (TÜV SÜD Energietechnik GmbH)

10:30 a.m.

Guidelines for the Modernization of Nuclear Power Plant Control Room and Human-System Interfaces, Joseph Naser (EPRI), Bob Fink (CDF Svc), John O'Hara (BNL), Doug Hill (MPR Assoc)

11:00 a.m.

A Practical Appreciation of the Implementation of a Fully Computerized Monitoring and Control System in N4 NPP Series: An Advanced Instrumentation and Control System, Paul DaCruz (Atos Origin)

Embedded Topical Meeting #2: NPIC&HMIT 2006

Regulatory Challenges and Approaches to Advanced Systems—Panel. Cochairs: James Bongarra (NRC), Autumn Szabo (NRC)

Ballroom B

The US Nuclear Regulatory Commission is anticipating licensing new nuclear power plants for the first time in more than twenty years. During that time, other countries will have licensed and built Generation III and Generation III+ reactors. This panel session will explore different approaches, challenges, benefits, and gaps in licensing and regulation of new plants. This discussion will be divided into two “sub sessions.” The first will focus on international approaches to licensing with an emphasis on human factors. The second will discuss current gaps in the licensing and regulation.

PANELISTS:

- James Bongarra (NRC)
- Daniel Tassett (ASN)
- Leena Norros (VTT Technical Research Centre)
- Hidekazu Yoshikawa (Kyoto Univ)
- Yun Hyung Chung (KINS)
- Scott Malcolm (AECL)

Innovative Approaches to Training and Training Technologies.

Chair: Mark Friedman (Day & Zimmerman NPS)

Tijeras

8:30 a.m.

Illustration Interface of Accident Progression in PWR by Quick Inference Based on Multilevel Flow Models, Hidekazu Yoshikawa, Jun Ouyang (Kyoto Univ), Yuji Niwa (Yokohama Natl Univ)

9:00 a.m.

Web- and System-Code Based, Interactive, Nuclear Power Plant Simulators, Kyung-Doo Kim (KAERI), Prashant Jain, Rizwan-Uddin (Univ of Illinois)

9:30 a.m.

Characterization of Transient Scenarios of Training of BWR Operators and its Evaluation by Experienced Instructors, Makoto Takahashi, Ichiro Mizuno, Masaharu Kitamura, Toshio Wakabayashi (Tohoku Univ), Yoichi Kawai (BWR Operator Training Center Corp)

10:00 a.m.

Toward a Powerful Problem-Based Training Tool for Harnessing Lessons Learned, William Edgar May, Robert E. Richards (INL)

TUESDAY, NOVEMBER 14, 2006 • 1:00 P.M.

Digital System Reliability—II. Chair: Gary Johnson (LLNL)

LaCienega

1:00 p.m.

An Overview of Digital I&C System Reliability Analysis in Nuclear Power Plants, Lixuan Lu (Univ of Ontario Inst of Technol)

1:30 p.m.

Nuclear Power Plant Digital System PRA Pilot Study with the Dynamic Flowgraph Methodology, Michael Yau, Majid Motamed, Sergio Guarro (ASCA, Inc.)

2:00 p.m.

Large Scale Validation of a Methodology for Assessing Software Reliability—A Case Study, Ying Shi, Wende Kong, Jun Dai (Univ of Maryland), Ming Li (Mission Assurance Services Contract, NASA Goddard Space Flight Center), Carol S. Smidts (Univ of Maryland)

2:30 p.m.

Incorporation of Markov Reliability Models for Digital Instrumentation and Control Systems into Existing PRAs, P. Bucci, L. A. Mangan, J. Kirschenbaum, D. Mandelli, T. Aldemir (Ohio State), S. A. Arndt (NRC)

3:00 p.m.

A Benchmark System for the Assessment of Reliability Modeling Methods for Digital Instrumentation and Control Systems in Nuclear Plants, J. Kirschenbaum, M. Stovsky, D. Mandelli, P. Bucci, T. Aldemir, D. W. Miller, E. Ekici (Ohio State), S. A. Arndt (NRC)

Advanced Sensors and Measurement Techniques—II. Cochairs: Roger Kisner (ORNL), Bob Felder (Optical Techniques)

Mesilla

1:00 p.m.

Feedwater Flow Measurement and Experience Using Clamp-On Transit-Time Ultrasonic Flow Meter in Nuclear Power Plants, Jae Hong Ha, Woo Hyeun Jang, Jung Yang Lee, Ho Cheol Jang, Hang Bae Kim (KOPEC)

1:30 p.m.

FLUENT Modeling of Ultrasonic Flow Meters in Feedwater Flow Profiles Associated with Two Out of Plane 90 Degree Bends, Richard N. Christensen (Ohio State), Sandra Lai (NRC), Don W. Miller (Ohio State), Steven Arndt (NRC)

2:00 p.m.

Uncertainty Analysis of Power Monitoring Transit Time Ultrasonic Flow Meters, Adam Orosz, Don W. Miller, Richard N. Christensen (Ohio State), Steven Arndt (NRC)

2:30 p.m.

How an 8 Path Chordal Ultrasonic Flowmeter Solves Steam Generator and Reactor Water Level Control Problems, Herb Estrada, Ernie Hauser (Caldon Ultrasonics, Nuflor Measurement Systems)

3:00 p.m.

Evaluation of the Measurement Technologies Required for the Jupiter Icy Moons Orbiter (JIMO) Reactor, David E. Holcomb, Roger A. Kisner, W. L. Bryan, James E. Hardy (ORNL)

Advanced Signal Processing Methods for Reactor Monitoring.

Cochairs: Belle Upadhyaya (Univ of Tennessee), Brandon Rasmussen (EPRI)

Pecos

1:00 p.m.

On-Line Condition Monitoring of Nuclear Systems via Symbolic Time Series Analysis, Venkatesh Rajagopalan, Asok Ray (Penn State), Humberto E. Garcia (INL)

1:30 p.m.

An Improvement of Mass Estimation Capability in Loose Parts Monitoring by Using Time-Frequency Analysis, Doo-Byung Yoon, Jin-Ho Park, Young-Chul Choi (KAERI), Chang-Ho Sohn (Samchang Enterprise), Ook-Ki Park (KHNP Co., Ltd)

2:00 p.m.

An Adaptive Distance Measure for Use with Nonparametric Models, Dustin R. Garvey, J. Wesley Hines (Univ of Tennessee)

2:30 p.m.

Outline of In-Core Sensor Validation Based on Correlation and Mutual Information Analysis, Stefan Fígedy (VUJE)

3:00 p.m.

Traditional and Robust Vector Selection Methods for Use with Similarity Based Models, J. Wesley Hines, Dustin R. Garvey (Univ of Tennessee)

3:30 p.m.

Inferential Smart Sensing for Feedwater Flowrate in PWRs, Man Gyun Na, In Joon Hwang (Chosun Univ), Yoon Joon Lee (Cheju National Univ)

Gen IV and Research Reactor I&C. Chair: Robert Edwards (Penn State)

Ruidoso

1:00 p.m.

Three-Dimensional Imaging and Precision Metrology for Liquid-Salt-Cooled Reactors, Charles W. Forsberg, Venugopal K. Varma, Thomas W. Burgess (ORNL)

1:30 p.m.

Instrumentation and Control Design for the Gas Turbine Modular Helium Reactor (GT-MHR), Edward (Ted) L. Quinn (Consultant), Arkal Shenoy (General Atomics)

2:00 p.m.

Development Process of the New Control Console of ININ's TRIGA Mark III Reactor, Tonatiuh Rivero-Gutiérrez (ININ/Instituto Tecnológico de Toluca), Eduardo Sáinz-Mejía (ININ), Jorge S. Benítez-Read (ININ/Instituto Tecnológico de Toluca), José L. González Marroquín (ININ)

Embedded Topical Meeting #2: NPIC&HMIT 2006

2:30 p.m.

Simulation and Optimal Design of Power Regulating System for China Advanced Research Reactor, Jianmin Zhang, Huaping Dong, Yunquan Guan (*Xi'an Jiaotong Univ*), Hai Zeng, Huajin Jin (*China Inst of Atomic Energy*)

Digital Upgrade and Qualification Issues in an Evolving Regulatory Environment. Chair: Ray Torok (EPRI)

San Miguel

1:00 p.m.

Digital Upgrade Issues and the Evolving Regulatory Environment, Richard D. Meiningner (*CHAR Svc*)

1:30 p.m.

I&C and Control Room Challenges and Opportunities for Maintaining and Modernizing Nuclear Power Plants, Joseph Naser (EPRI)

2:00 p.m.

Technical and Regulatory Challenges for Digital Instrumentation & Control and Control Room Systems in Nuclear Plants, Ray Torok, Joseph Naser (EPRI), Tony Harris, Kimberly Keithline (NEI)

2:30 p.m.

Qualification of Integrated Tool Environments (QUITE) for the Development of Computer-Based Safety Systems in NPP, Horst A. Miedl, Josef Märtz (*Inst for Safety Technol GmbH*)

3:00 p.m.

Qualification of Programmable Electronic System (PES) Equipment Based on International Nuclear I&C Standards, J. de Grosbois, G. A. Hepburn, R. Olmstead (AECL), W. Goble (*Exida*), V. Kumar (*Carleton Univ*)

3:30 p.m.

I&C Obsolescence Solutions for Operating Plants, Robert M. Queenan (*NUS Instruments*)

User Interaction with Automation. Chair: Gyrd Skraaning (Halden Reactor Project)

Ballroom A

1:00 p.m.

A Study of Reset Mode in Advanced Alarm System Simulator, Fei-hui Huang, Sheu-Ling Hwang (*Tsinghua Univ*), Tzu-Chung Yenn, Yuan-Chang Yu, Chong-Cheng Hsu, Hao-Wu Huang (*Nuclear Energy Rsch*)

1:30 p.m.

Toward Designing for Trust in Database Automation, Pierre P. Duez, Greg A. Jamieson (*Univ of Toronto*)

2:00 p.m.

Trust in Automation and Metacognitive Accuracy in NPP Operating Crews, Gyrd Skraaning Jr., Ann Britt Miberg Skjerve (*OECD Halden Reactor Project*)

2:30 p.m.

Operator Experiences on Working in Screen-Based Control Rooms, Leena Salo, Jari Laarni, Paula Savioja (*VTT Technical Research Centre of Finland*)

3:00 p.m.

Team Situation Awareness in Nuclear Power Plant Process Control: A Literature Review, Task Analysis and Future Research, Ruiqi Ma (*AREVA NP*), David B. Kaber (*NCSU*), Jeffrey M. Jones, Robert L. Starkey (*AREVA NP*)

3:30 p.m.

Situation Awareness and Trust in Computer-Based Procedures in Nuclear Power Plant Operations, Eric B. Throneburg, Jeffrey M. Jones (*AREVA NP*)

Regulatory Oversight and Involvement in Safety Culture—Panel.

Chair: Eric Fries (*Equinox Consult*)

Ballroom B

This panel session will discuss regulatory and/or oversight agency involvement in license/facility nuclear safety culture. Recent actions by the US Nuclear Regulatory Commission (NRC) to modify its Reactor Oversight Process to increase its involvement in the assessment of UP nuclear plant safety culture will be addressed. The NRC actions

followed extensive debate as to whether and/or how the NRC should be involved in plant safety culture. Panelists will include individuals from the US and Canadian commercial nuclear power sectors and the US Defense Nuclear Facilities Safety Board.

PANELISTS:

- Michael H. Brothers (*Brothers Eng and Consulting, LLC*)
- Doug Coleman (*OPG*)
- Eric V. Fries (*Equinox Consulting LLC*)
- Charles Martin (*DNFSB*)
- Brian C. McCabe (*Progress Energy Carolinas, Inc.*)

Knowledge Capture and Engineering. Chair: Brian Worley (ORNL)

Tijeras

1:00 p.m.

Data Mining and Nuclear Safety, S. C. Zhong (*Northeast Normal Univ*), J. W. Guan, D. A. Bell (*The Queen's Univ of Belfast*), Y. X. Bi (*Univ of Ulster at Jordanstown*), Q. X. Wu (*The Queen's Univ of Belfast*), D. Y. Liu (*Jilin Univ*), D. D. Zhou (*Northeast Normal Univ*), Q. Zhang (*Baicheng Normal College*), S. Gao (*Univ of Waterloo*)

1:30 p.m.

Applications of Learning Based Systems at AREVA Group, Frédéric Jeanmart, Christophe Leclerc (*Euriware*)

2:00 p.m.

Operating Experience Review for the AP1000 Plant, Thomas E. Chaney, Melvin H. Lipner (*Westinghouse*)

2:30 p.m.

Detection of Unusual Events and Trends in Complex Non-Stationary Data Streams, R. B. Perez (*Univ of Tennessee*), V. A. Protopopescu, B. A. Worley (ORNL), C. L. Perez (*Univ of Leeds*)

WEDNESDAY • NOVEMBER 15, 2006

7:30 AM - 5:00 PM MEETING REGISTRATION

8:00 AM - 10:00 AM SPOUSE/GUEST HOSPITALITY

8:00 AM - 11:30 AM TOFE 2006 TECHNICAL SESSIONS (see pg 32)

8:30 AM - 11:30 AM NPIC&HMIT 2006 TECHNICAL SESSIONS

- Controls Systems
- Cyber-Security and Wireless Applications—I
- Diagnostics and Predictive Maintenance—I
- Applications of Next Generation I&C Systems
- Licensing Issues for Advanced I&C Technologies
- Visualization Technology to Support Decision-Making and Other Activities
- Computerized Procedure Systems
- Function-Based Approaches to Control Room Design

8:30 AM - 11:30 AM 2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)

11:30 AM - 1:00 PM MATERIALS SCIENCE AND TECHNOLOGY (MSTD) AWARDS LUNCHEON

1:00 PM - 4:00 PM NPIC&HMIT 2006 TECHNICAL SESSIONS

- I&C Architectural Approaches
- Cyber-Security and Wireless Applications—II
- Diagnostics and Predictive Maintenance—II
- Current Regulatory Challenges for I&C
- Lessons Learned in Digital Upgrades
- Designing Better Alarm Systems
- HFE Design and Analysis Tools—I
- Virtual Reality: Applications and Issues

1:00 PM - 4:00 PM 2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)

1:00 PM - 5:00 PM TOFE 2006 TECHNICAL SESSIONS (see pg 32)

4:30 PM - 6:30 PM NPIC&HMIT 2006 SPECIAL SESSION: "GNEP — I&C Issues—Panel"

6:50 PM - 10:00 PM EVENING EVENT: "Dinner at El Pinto Restaurant"

7:00 PM - 9:00 PM PUBLIC INFORMATION WORKSHOP: "Focus on Communications: Speaking to the Media"

WEDNESDAY, NOVEMBER 15, 2006 • 8:30 A.M.

Controls Systems. Session Chair: Tony Harris (NEI)

LaCienega

8:30 a.m.

Performance Evaluation of Network-Based Steam Generator Level Control, Qingfeng Li, Jin Jiang (*Univ of Western Ontario*)

9:00 a.m.

The Trend of Digital Control System Design for Nuclear Power Plants in Korea, Seung-Hyun Park, Hwan-Yong Jung, Choong-Yeol Yang, Il-Nam Choe (*KOPEC*)

Embedded Topical Meeting #2: NPIC&HMIT 2006

9:30 a.m.

Enabling Autonomous Control for Space Reactor Power Systems, Richard T. Wood (ORNL)

10:00 a.m.

Design of a Fault-Tolerant Controller for the SP-100 Space Reactor, Man Gyun Na (Chosun Univ), Belle R. Upadhyaya (Univ of Tennessee)

10:30 a.m.

Hitachi's Design and Results in Replacement of Nuclear Plant Instrumentation, Junichi Kitamura, Takashi Arakida (Hitachi)

Cyber-Security and Wireless Applications—I. Chair: Roman Shaffer (NRC)

Mesilla

8:30 a.m.

Applications for Cyber Security—System and Application Monitoring, Joseph E. Marron (Invensys Process Syst)

9:00 a.m.

Scenario-Based Approach to Risk Analysis in Support of Cyber Security, David I. Gertman, Ralph Folkers, Jeff Roberts (INL)

9:30 a.m.

Cyber Secure Systems Approach for NPP Digital Control Systems, Timothy J. McCreary, Allen Hsu (HF Controls Corp)

10:00 a.m.

Cyber Security Vulnerability Impact on I&C Reliability, Mark Hadley, Justin McBride (PNNL)

10:30 a.m.

Security and SCADA Protocols, Vinay M. Ijure, Ronald D. Williams (Univ of Virginia)

Diagnostics and Predictive Maintenance—I. Chair: J. Wes Hines (Univ of Tennessee)

Pecos

8:30 a.m.

On-Line Condition Monitoring Applications in Nuclear Power Plants, H. M. Hashemian (Analysis and Measurement Svc Corp), Madeline Anne Feltus (DOE)

9:00 a.m.

Experimental Study on the Plant State Estimation for the Condition-Based Maintenance, Jun-ichi Harada, Makoto Takahashi, Masaharu Kitamura, Toshio Wakabayashi (Tohoku Univ)

9:30 a.m.

Large-Scale Implementation of On-Line Calibration Monitoring—Issues and Possible Solutions, Davide Rovero, Mario Hoffmann (Institut for Energiteknikk, OECD Halden Reactor Project)

10:00 a.m.

Application of On-Line Monitoring Techniques to Nuclear Plant Data, Dustin Garvey, Jamie Garvey, Rebecca Seibert, J. Wesley Hines (Univ of Tennessee), Steven A. Arndt (NRC)

10:30 a.m.

Diagnostics and Performance Evaluation of Neutron Monitoring System Detectors, Timothy Kniss, Jack Doyle (GE Energy)

Applications of Next Generation I&C Systems. Chair: Don Miller (Ohio State)

Ruidoso

8:30 a.m.

An On-Line Regional Overpower Surveillance System for CANDU Reactors, D. J. Wallace, V. Caxaj, A. S. Seidu, W. Hartmann, B. Sur, A. McDonald (AECL)

9:00 a.m.

Development of the Monitoring System to Detect the Piping Thickness Reduction, Na Young Lee, Kyung Ha Ryu, Young Jin Oh, Il Soon Hwang (Seoul Natl Univ)

9:30 a.m.

Improving CRDCS Through Digital Technology for Pressurized Water Reactors, Phil Liddle (AREVA NP)

10:00 a.m.

Spallation Neutron Source Accelerator Facility Target Safety and Non-Safety Control Systems, R. E. Battle, J. K. Munro Jr., William R. DeVan (ORNL)

10:30 a.m.

Evaluation of a High Speed Neutron Counting System Using SiC Semiconductor Detector, M. Reisi Fard, V. Krishnan, T. E. Blue, D. W. Miller (Ohio State)

Licensing Issues for Advanced I&C Technologies. Chair: Richard Wood (ORNL)

San Miguel

8:30 a.m.

The Development of Regulatory Expectations for Computer-Based Safety Systems for the UK Nuclear Programme, Peter J. Hughes (HM Nuclear Installations Inspectorate), Mark Westwood (Marine Engineering Submarines), Ken Tapping (Serco Assurance)

9:00 a.m.

Licensing Review of Foreign I&C Systems for Ukrainian Nuclear Power Plants, Oleg Brenman (Westinghouse), Richard S. Denning, Peter Cybulskis (Battelle), Svetlana V. Vynogradskaja, Mikhail A. Yastrebenetsky (SSTC NRS), Nikolay V. Afanasiev (NAEK Energoatom)

9:30 a.m.

Regulatory Guidance for Lightning Protection in Nuclear Power Plants, R. A. Kisner, J. B. Wilgen, P. D. Ewing, K. Korsah (ORNL), C. E. Antonescu (NRC)

10:00 a.m.

Research Reactor Operational Safety Improvements Required by Regulatory Authority, Andrzej T. Mikulski (Natl Atomic Energy Agency)

Visualization Technology to Support Decision-Making and Other Activities. Chair: Joseph Naser (EPRI)

Ballroom A

8:30 a.m.

Utilizing 3D-Visualization to Apply Compulsory ALARA Principles in Nuclear Power Plant Design and Day-to-Day Operation, Robert L. Sanders, Joseph E. Lake (ORNL)

9:00 a.m.

Use of 2.5-D and 3-D Technology to Evaluate Control Room Upgrades, Lewis F. Hanes (Consultant), Joseph Naser (EPRI)

9:30 a.m.

A Virtual Control Room with an Embedded, Interactive Nuclear Reactor Simulator, Stefano Markidis, Rizwan-uddin (Univ of Illinois)

10:00 a.m.

EDF Field Operation Computerization Study., Laure Guillot, D. Pirus (EDF)

Computerized Procedure Systems. Chair: Jacques Hugo (PBMR)

Ballroom B

8:30 a.m.

Needs Analysis of a Flexible Computerized Management Infrastructure, S. Usman (Univ of Missouri, Rolla), B. K. Hajek (NETS, Inc.), S. F. Ali (Tuskegee Univ)

9:00 a.m.

Dynamic Computer Based Procedures System for the AP1000 Plant, Melvin H. Lipner, Roger A. Mundy, Michael D. Franusich (Westinghouse)

9:30 a.m.

Aiming for a Fully Integrated Computerized Procedure System, Joseph E. Marron (Invensys Process Syst)

10:00 a.m.

Usability Test of the ImPRO, Computer-Based Procedure System, Yeonsub Jung, Jaesung Lee (KHNP)

10:30 a.m.

Study on Technical Improvements for SOP of LINGAO 3&4 Under Construction in China, Shi Ji, Francis Pechuzal, Li Yan, Yin Zhongping, Wang Zhifang, Zhou Huotang (CGNPC)

Embedded Topical Meeting #2: NPIC&HMIT 2006

Function-Based Approaches to Control Room Design. *Chair:* Dominique Pirus (*EDF*)

Tijeras

8:30 a.m.

A Revival of the Alarm System: Making the Alarm List Useful During Incidents, Jan Eric Larsson, Bengt Öhman, Antonio Calzada (*GoalArt*), Christer Nihlwing, Håkon Jokstad, Liv Iren Kristianssen, Jon Kvalem (*IFE*), Morten Lind (*Technical Univ of Denmark*)

9:00 a.m.

Is Function-Based Control Room Design Human-Centered?, Leena Norros, Paula Savioja (*VTT Technical Research Center of Finland*)

9:30 a.m.

Why and How a Functional Information System Improves Computerized Operations, D. Pirus (*EDF*)

10:00 a.m.

Development and Evaluation of a Function-Oriented Display System, Gisle Andresen, Helena Broberg, Jon Kvalem (*IFE OECD HRP*)

WEDNESDAY, NOVEMBER 15, 2006 • 1:00 P.M.

I&C Architectural Approaches. *Chair:* Joseph Murray (*Invensys*)

LaCienega

1:00 p.m.

Invensys Solution for a Complete Digital I&C System Upgrade for a Nuclear Power Plant, Leonid Meter (*Invensys Process Syst*)

1:30 p.m.

Ethernet Redundancy, Kevin Burak (*Invensys Process Syst*)

2:00 p.m.

The Network Architecture and Site Test of DCIS in Lungmen Nuclear Power Station, Chia-Kuang Lee (*Taiwan Power Company*)

2:30 p.m.

Evaluation of I&C Architecture Alternatives Required for the Jupiter Icy Moons Orbiter (JIMO) Reactor, Michael D. Muhlheim, Richard T. Wood, William L. Bryan, Thomas L. Wilson, Jr., David E. Holcomb, Kofi Korsah (*ORNL*), Usha Jagadish (*Athma-Tech*)

3:00 p.m.

The Architecture of a Reliable Software Monitoring System for Embedded Software Systems, John Munson, Axel Krings, Robert Hiromoto (*Univ of Idaho*)

Cyber-Security and Wireless Applications—II. *Chair:* Donald Dudenhoeffer (*INL*)

Mesilla

1:00 p.m.

An Ethernet/IP Security Review with Intrusion Detection Applications, Sean A. Laughter, Ronald D. Williams (*Univ of Virginia*)

1:30 p.m.

On Shaky Ground—A Study of Security Vulnerabilities in Control Protocols, Eric J. Byres (*Wurldtech Research*), Dan Hoffman (*Univ of Victoria*), Nate Kube (*Wurldtech Analytics*)

2:00 p.m.

Using Cyber Vulnerability Testing Techniques to Expose Undocumented Security Vulnerabilities in DCS and SCADA Equipment, Jonathan Pollet (*PlantData Technologies*)

2:30 p.m.

Anomaly-Based Intrusion Detection for SCADA Systems, Dayu Yang, Alexander Usynin, J. Wesley Hines (*Univ of Tennessee*)

3:00 p.m.

Safety Assessment of Inter-Channel/Inter-System Digital Communications: A Defensive Measures Approach, Nguyen NQ Thy (*EPRI/EDF*)

Diagnostics and Predictive Maintenance—II. *Chair:* Hashem Hashemian (*AMS*)

Pecos

1:00 p.m.

Performance and Reliability Monitoring of Advanced Reactors, David G. Robinson (*SNL*)

1:30 p.m.

Thermal Performance Monitoring and Assessment in Dukovany Nuclear Power Plant, Frantisek Madron (*Chemplant Technol*), Jaroslav Papuga (*CEZ a.s.*), Jiri Pliska (*I & C Energo*)

2:00 p.m.

A Hybrid Model Combining First-Principles and Data-Driven Models for On-Line Condition Monitoring, Bulent Alpay (*Univ of Michigan*), Humberto E. Garcia, Tae-Sic Yoo (*INL*)

Current Regulatory Challenges for I&C. *Cochairs:* Layla Sandell (*EPRI*), Steve Arndt (*NRC*)

Ruidoso

1:00 p.m.

Development of Regulatory Guidance for Risk-Informing Digital System Reviews, Steven A. Arndt (*NRC*)

1:30 p.m.

Evaluation Issues on Real-Time Operating System in Nuclear Power Plants, Y.M. Kim, C. H. Jeong, J. S. Koh (*KINS*)

2:00 p.m.

Risk Informed Approach for Complex Safety-Critical Digital Application Development, Hyun Gook Kang, Seung-Cheol Jang (*KAERI*)

2:30 p.m.

Integrating Software Reliability Concepts into Risk and Reliability Modeling of Digital Instrumentation and Control Systems Used in Nuclear Power Plants, Steven A. Arndt (*NRC*)

Lessons Learned in Digital Upgrades. *Chair:* Janos Eiler (*Paks Nuclear Power Plant*)

San Miguel

1:00 p.m.

South Ukraine NPP: Safety Improvements Through Plant Computer Upgrade, Oleg Brenman (*Westinghouse*), Mikhail A. Chernyshov (*Westron*), Richard S. Denning (*Battelle*), Sergey A. Kolesov, Heorhy H. Balakan, Borys I. Bilyk, Vyacheslav I. Kuznetsov (*NAEK Energoatom*), Grigory Trosman (*DOE*)

1:25 p.m.

Lessons Learned in Digital Upgrade Projects: Digital Control System Implementation at U.S. Nuclear Power Stations, Sean Kelley, Tricia W. Bolian (*AREVA NP*)

1:50 p.m.

The Comprehensive I&C Modernization Project ANIS+ of the Swiss NPP Leibstadt, Manfred Märzendorfer (*Kernkraftwerk Leibstadt AG*)

2:15 p.m.

Digital Safety I&C System in the Paks NPP, Hungary, Janos Eiler (*Paks Nuclear Power Plant Ltd.*)

2:40 p.m.

Design Enhancement in BWR Feedwater Control System: Experience Feedback from Kousheng NPP, Chuan-Chung Chen (*Taiwan Power Company*)

3:05 p.m.

Control Room Modernization at Finnish Nuclear Power Plants—Two Projects Compared, Jari Laarni, Leena Norros (*VTT Technical Research Centre of Finland*)

3:30 p.m.

Digital Controls for Plant Control Systems at the Ulchin 5 & 6 NPP: Lessons for the U.S. NPP Retrofits?, Tim McCreary, John Stevens (*HF Controls Corp*)

Designing Better Alarm Systems. *Chair:* Bob Fink (*CDF Svc*)

Ballroom A

1:00 p.m.

Dynamic Alarm Response Procedures, Jeffery Martin, Peter Gordon, Kenneth Fitch (*Westinghouse*)

Embedded Topical Meeting #2: NPIC&HMIT 2006

1:30 p.m.

The Advanced CANDU Reactor Annunciation System—Compliance with IEC Standard and U.S. NRC Guidelines, R. Leger, S. Malcolm (*AECL*), E. Davey (*Crew Syst Solutions*)

2:00 p.m.

Alarm System Advances and Innovations, David Saklad (*Invensys Process Syst*)

2:30 p.m.

New Solutions for Alarm Problems, Jan Eric Larsson, Bengt Öhman, Antonio Calzada (*GoalArt*), Joseph DeBor (*DeBor & Assoc*)

3:00 p.m.

Using Active Database Techniques for an Advanced Alarm Processing, Gwi-sook Jang (*KAERI*), Duk-hyun Seong (*Samchang Enterprise*), Jong-yong Keum, Heui-young Park (*KAERI*), Young-Kuk Kim (*Chungnam National Univ*)

3:30 p.m.

Good Alarm Design Plays a Vital Role in Successful DCS Implementation: Hard Learned Lessons from Petrochemical Applications, Chris Wilson (*TIPS*), Doug Rothenberg (*D-RoTH*)

HFE Design and Analysis Tools—I. Chair: Angie Sebock (*MicroAnalysis and Design*)

Ballroom B

1:00 p.m.

Development of Human Factors Engineering Guidance for Safety Evaluations of Advanced Reactors, John O'Hara (*BNL*), Julius J. Persensky, Autumn Szabo (*NRC*)

1:30 p.m.

Identification of Advanced Human Factors Engineering Analysis, Design and Evaluation Methods, Chris Plott, Ann Marie Roman, Lila Laux, Julie Bzostek, John Milanski, Scott Scheff (*Alion Science and Technol, MA&D Operation*)

2:00 p.m.

Improving Knowledge Management Systems with Latent Semantic Analysis, Angela Sebok, Christopher Plott (*Alion Science and Technology, MA&D Operation*), Noelle LaVoie (*Pearson Knowledge Technol*)

2:30 p.m.

Practical HFE Tools as Part of a HFE Programme in a Concurrent Engineering Environment, Heinrich Engela, Jacques Hugo, Ilse van Staden, Elsjebe Sampson (*PBMR*)

3:00 p.m.

Tailoring Human System Interface Design Guidelines for the AP1000 Nuclear Power Plant, Julie Reed (*Energy Solutions*)

Virtual Reality: Applications and Issues. Chair: Terje Johnsen (*Halden Reactor Project*)

Tijeras

1:00 p.m.

Development of Marker-Based Tracking Methods for Augmented Reality Applied to NPP Maintenance Work Support and Its Experimental Evaluation, Hirotake Ishii, Hidenori Fujino, Bian Zhiqiang, Tomoki Sekiyama, Hiroshi Shimoda, Hidekazu Yoshikawa (*Kyoto Univ*)

1:30 p.m.

Virtual Reality in Planning and Operations From Research Topic to Practical Issue, Grete Rindahl, Terje Johnsen, Niels- Kr. F. Mark, Geir Meyer (*OECD Halden Reactor Project*)

2:00 p.m.

Chavir: Virtual Reality Simulation for Interventions in Nuclear Installations, JB. Thevenon, O. Tirel, L. Lopez (*Euriware*), L. Chodorge, P. Desbats (*CEA*)

2:30 p.m.

Use of the Virtual Reality in Maintenance Operation at EDF, B. Nouailhas, S. Tonnoir, P. Loureillard (*EDF*)

WEDNESDAY, NOVEMBER 15, 2006 • 4:30 p.m.–6:30 p.m.

GNEP: I&C Issues—Paper/Panel. Cochairs: Edward Quinn (*Consultant*), Leonard Bond (*INL*)

Ballroom A

PAPER:

4:30 p.m.

Outline of Human Machine Interface at Rokkasho Reprocessing Plant, Tadashi Niioka, Takashi Miyazaki, Daisuke Fujita, Ayami Esashika, Yutaka Yoshida, Wataru Nakamura, Takao Tochigi (*JNFL*), Atsushi Yoshimoto, Mika Yokoi (*Toshiba Corp*)

PANEL DISCUSSION

5:00 p.m.

PANELISTS:

- Keynote Presentation, Vic Reis (*DOE*)
- Human Factors at the Rokkasho Reprocessing Plant, Tadashi Niioka (*JNFL*)
- French Experience with Reprocessing, Gilles Bignan (*CEA*)

THURSDAY • NOVEMBER 16, 2006

7:30 AM - 2:00 PM MEETING REGISTRATION

8:30 AM - 11:30 AM NPIC&HMIT 2006 TECHNICAL SESSIONS

- Digital I&C Technology
- Aging and Environmental Compatibility
- Diagnostics and Prognostics
- Setpoints
- Digital I&C Design, Development and Assessment
- Computerized Operator Decision and Support Systems
- HFE Design and Analysis Tools—II
- Advances and Challenges in HRA

8:30 AM - 11:30 AM 2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)

1:00 PM - 4:00 PM NPIC&HMIT 2006 TECHNICAL SESSIONS

- Wireless Communications Technology
- Digital Platforms and Tools
- Software Quality Assurance
- ICHMI Startup Experience at New Facilities—Panel
- New HMI Technology
- Approaches to HFE Verification and Validation

1:00 PM - 4:00 PM 2006 ANS WINTER MEETING TECHNICAL SESSIONS (see pg 13)

THURSDAY, NOVEMBER 16, 2006 • 8:30 A.M.

Digital I&C Technology. Cochairs: Doug Hill (*MPR*), Chip Martin (*DNFSB*)

LaCienega

8:30 a.m.

Instrumentation and Control and Human Machine Interface Science and Technology Roadmap in Support of Advanced Reactors and Fuel Programs in the U.S., Don W. Miller (*Ohio State*), Steven A. Arndt (*NRC*), Leonard Bond, Donald Dudenhoefter, Bruce Hallbert (*INL*), David E. Holcomb, Richard T. Wood (*ORNL*), Joseph A. Naser (*EPRI*), John O'Hara (*BNL*), Edward (Ted) L. Quinn (*Consultant*)

9:00 a.m.

IAEA Activities in the Field of NPP I&C, Oszvald Glöckler (*IAEA*)

9:30 a.m.

Concept of SPDS Integrated into Distributed Computer System (DCS), Sergey S. Anikanov (*Westinghouse*)

10:00 a.m.

Development of FPGA-Based Safety-Related I&C Systems, Yasushi Goto, Naotaka Oda, Tadashi Miyazaki, Toshifumi Hayashi, Toshifumi Sato, Shinji Igawa (*Toshiba Corp*)

10:30 a.m.

RAFFIA—Reliable ASIC/FPGA-Based Solutions for I&C Applications, John Lach, Scott Bingham, Travis Lenhart (*Univ of Virginia*), Thuy Nguyen, Patrick Salaun (*EDF*)

11:00 a.m.

Lessons Learned from Implementation of the European Commission TACIS/PHARE Safety Upgrading Projects Related to I&C, Alexander Duchac, Michel Bieth (*European Commission*)

Embedded Topical Meeting #2: NPIC&HMIT 2006

10:30 a.m.

Current Status of Integrated HFE V&V System of APR1400, Myeong-Soo Lee, Jin-Hyuk Hong, Seung-Ho Lee, Yong-Kwan Lee (*KEPRI*)

11:00 a.m.

Shift Manager Workload Assessment—A Case Study, K. Bernston, A. Kozak (*Bruce Power*), J. Scott Malcolm (*AECL*)

Advances and Challenges in HRA. Chair: John Forester (*SNL*)

Tijeras

8:30 a.m.

A Nuclear Plant Accident Diagnosis Method to Support Prediction of Errors of Commission, Y. H. J. Chang (*Univ of Maryland/Paul Scherrer Inst*), K. Coyne, A. Mosleh (*Univ of Maryland*)

9:00 a.m.

Modeling Human Reliability Analysis Using MIDAS, Ronald Laurids Boring (*INL*)

9:30 a.m.

Human Reliability Analysis Issues and Research Needs for Advanced Reactors, Erasmia Lois (*NRC*), John A. Forester (*SNL*), Alan Kolaczowski (*SAIC*)

10:00 a.m.

A Human Reliability Based Usability Evaluation Method for Safety-Critical Software, Ronald L. Boring, Tuan Q. Tran, David I. Gertman (*INL*), Austin Ragsdale (*Brigham Young Univ*)

10:30 a.m.

Qualitative Human Reliability Analysis for Spent Fuel Handling, Jeffrey D. Brewer (*SNL*), Paul Amico (*SAIC*), Susan E. Cooper (*NRC*)

11:00 a.m.

New Advances in Human Reliability Using the EPRI HRA Calculator, Jeffrey A. Julius, Jan E. Grobbelaar (*Scientech*)

THURSDAY, NOVEMBER 16, 2006 • 1:00 P.M.

Wireless Communications Technology. Cochairs: Tekia Govan (*NRC*), Brandon Rasmussen (*EPRI*)

LaCienega

1:00 p.m.

Physical Layer Simulation Study for the Coexistence of WLAN Standards, M. K. Howlader (*Marquette Univ*), C. Keiger (*Analysis and Measurement Services Corp*), P. D. Ewing (*ORNL*), T. V. Govan (*NRC*)

1:30 p.m.

Safety-Related Issues Associated with Implementing Wireless Systems in Nuclear Facilities, B. J. Kaldenbach, P. D. Ewing, M. R. Moore, K. Korsah (*ORNL*), C. E. Antonescu, T. V. Govan (*NRC*)

2:00 p.m.

Applying an Intelligent and Automated Emissions Measurement System to Characterize the RF Environment for Supporting Wireless Technologies, Philip F. Keebler, Kermit O. Phipps (*EPRI Solutions*)

2:30 p.m.

Potential Applications of Fieldbus and Wireless Technologies in Nuclear Power Plants, Abdullah Kadri, Jin Jiang (*Univ of Western Ontario*)

Digital Platforms and Tools. Chair: Man Gyun Na (*Univ of Tennessee*)

Mesilla

1:00 p.m.

Vulcan/Vulcan-M: Certified State-of-the-Art I&C Product Line, Sergey S. Anikanov (*Westinghouse*), Mikhail A. Chernyshov (*Westron*)

1:30 p.m.

Modeling Digital Control Systems in TRACE, Robert M. Edwards (*Penn State*), Roman A. Shaffer, Steven A. Arndt (*NRC*)

2:00 p.m.

Virtual Control System Environment: A Modeling and Simulation Tool for Process Control Systems, Erik Lee, John Michalski, Peter Sholander, Brian Van Leeuwen (*SNL*)

2:30 p.m.

Plant Computer Applications' Design and Implementation Tools' Set, Sergey S. Anikanov (*Westinghouse*), Igor V. Stolyetnyy, Mykhaylo I. Tregubov, Oleksey L. Guslyakov, Yuriy I. Gladkov (*Westron*)

Software Quality Assurance. Cochairs: Jeff Larson (*Invensys*), Dean Crumpacker (*Sargent & Lundy*)

Pecos

1:00 p.m.

Software Quality Assurance Plans for Safety-Critical Software, Phil Liddle (*AREVA NP*)

1:30 p.m.

Formal Verification and Validation of the Safety-Critical Software in a Digital Reactor Protection System, Kee-Choon Kwon, Gee Yong Park (*KAERI*)

ICHMI Startup Experience at New Facilities—Panel. Cochairs: William Phoenix (*Idaho State Univ*), John Hefler (*Altran Corp*)

Ruidoso

1:00 p.m.

PANELISTS:

- Scott Peterson (*PG&E Diablo Canyon*)
- Charles Martin (*DNFSB*)
- William Phoenix (*Idaho State Univ*)
- Joseph Murray (*Invensys*)

New HMI Technology. Chair: Bruce Hallbert (*INL*)

San Miguel

1:00 p.m.

Studying Computerized Emergency Operating Procedures to Evaluate the Impact of Strong Procedure Guidance on Operators' Work Practices, Genevieve Filippi (*EDF*)

1:30 p.m.

Investigation on the Design of Human-System Interface for Advanced Nuclear Plant Control Room, Chang-Fu Chuang, Hwai-Pwu Chou (*Natl Tsing Hua Univ*)

2:00 p.m.

Results of AP1000 Human System Interface Engineering Tests, Robert Fuld (*Robert B. Fuld, LLC*), Daryl Harmon (*Westinghouse*)

Approaches to HFE Verification and Validation. Chair: Leena Norros (*VTT*)

Tijeras

1:00 p.m.

Definition of Human Factor Requirements in the Invitation to Tender and System Specifications, Christine Remond, D. Pirus (*EDF*)

1:30 p.m.

Development of Human Performance Evaluation Battery for Integrated System Validation of the HSI for an Advanced Control Room, Shang H. Hsu (*Natl Chiao Tung Univ*), Tung-Ming Wu, Jeen-Yee Lee (*Taiwan Power Company*)

2:00 p.m.

Human Factors Engineering Verification and Validation for APR1400 Computerized Control Room, Yeong-Cheol Shin, Hyung-Keun Moon, Jong-Hyun Kim (*KHNP*)

2:30 p.m.

Insights from a Benchmark Integrated System Validation of a Modernized NPP Control Room: Performance Measurement and the Comparison to the Benchmark System, Per Øivind Braarud, Gyrð Skraaning Jr. (*OECD Halden Reactor Project*)

3:00 p.m.

Validating the Appropriateness of TACOM Measure: Comparing TACOM Scores with Subjective Workload Scores Quantified by NASA-TLX Technique, Jinkyun Park, Wondea Jung (*KAERI*)



ANS Student Professional Development Workshop

2006 ANS Student Professional Development Workshop Mixer

Saturday, November 11, 2006
6:00 p.m. - 8:00 p.m.
Location: Ulam 1 (Doubletree Hotel)

2006 ANS Student Professional Development Workshop ***Making the Most of Your ANS Experience***

Sunday, November 12, 2006
8:00 a.m. - 12:00 p.m.
Location: Ulam 1 (Doubletree Hotel)

Student members in the ANS have nearly identical opportunities as all other ANS members, but are often at a loss for how to take advantage of them. Held in conjunction with the ANS Winter Meeting, the Student Workshop is designed to provide students with a working understanding of ANS operations, ideas of how to get involved both technically and in Society governance, and an opportunity to meet personally with leaders of the Society and the nuclear industry. The registration fee (\$20) includes dinner on Saturday evening and the Sunday morning workshop.

Saturday evening, the student group will gather for a casual meal and informal discussions with leaders in industrial, governmental, and research sectors of the nuclear industry. These leaders will discuss their perspectives on the opportunities for professional growth through the ANS. Students will interact with the representatives and ask questions regarding various career paths.

Sunday morning, the workshop will include presentations on several aspects of membership in the American Nuclear Society. Breakout sessions will foster a free exchange of ideas and sharing of experiences between students and with presenters. Opportunities for student involvement will be stressed, including:

- Organizing technical sessions with the technical divisions
- Preparing and submitting technical papers
- Contributing to paper reviews
- Getting involved in society governance
- Brainstorming and sharing ideas for student and local sections
- Mentoring and communicating across the generations

Workshop participants are encouraged to also register for the ANS national meeting, attend technical sessions in their areas of interest, and participate in the mentor program.

Professional Development Workshop

Professional Development Workshop: **Digital Instrumentation and Control**

Sunday, November 12, 2006
8:00 a.m. – 5:00 p.m.
Location: Ulam 3 (Doubletree Hotel)

Purpose of Workshop:

This course addresses the latest developments on the use of software-based equipment on nuclear plant applications, both for existing and new plants. This has become increasingly important as plants move into License Renewal, and in consideration of Obsolete Equipment Upgrades and replacements at existing facilities. Speakers will provide the perspectives of the Nuclear Regulatory Commission, the Electric Power Research Institute, industry and international participation, with emphasis on most recent developments and ongoing activities including the new plant Combined Operating License (COL) application process in the U.S.

Draft Schedule:

TIME	TOPIC	SPEAKER
8:00 A.M. – 8:15 A.M.	Introduction of Participants and Overview	Ted Quinn (<i>Longenecker and Associates</i>)/Don Miller (<i>The Ohio State</i>)
8:15 A.M. – 9:00 A.M.	Regulatory Framework	Matt Chiramal (<i>NRC</i>)
9:00 A.M. – 9:45 A.M.	Latest Guidance in HMI/HSI	John O'Hara (<i>BNL</i>)
9:45 A.M. – 10:00 A.M.	Overview Perspective	Don Miller (<i>The Ohio State</i>)
10:00 A.M. – 10:15 A.M.	Break	
10:15 A.M. – 11:00 A.M.	NRC Research Programs	Steve Arndt (<i>NRC</i>)
11:00 A.M. – 11:45 A.M.	EPRI Program	Ray Torok (<i>EPRI</i>)
11:45 A.M. – 12:30 P.M.	Lunch	
12:30 P.M. – 1:15 P.M.	NEI Lessons Learned	Kimberly Keithline (<i>NEI</i>)
1:15 P.M. – 2:00 P.M.	Triconex Lessons Learned	Joe Murray (<i>IPS Triconex</i>)
2:00 P.M. – 2:15 P.M.	Break	
2:15 P.M. – 3:00 P.M.	Westinghouse Lessons Learned	William Catullo (<i>Westinghouse</i>)
3:00 P.M. – 3:45 P.M.	GE Lessons Learned	Rich Miller (<i>GE</i>)
3:45 P.M. – 4:30 P.M.	AREVA Lessons Learned	Phil Liddle (<i>AREVA</i>)
4:30 P.M. – 5:00 P.M.	Panel Discussion	ALL

DOE Nuclear Criticality Safety Program

Endusers Focus-Group Workshop

“Nuclear Criticality Safety Program Infrastructure Program Support for New Frontiers: GNEP/Advanced Fuel Cycle Facility and 2030 Complex of the Future”

FRIDAY, NOVEMBER 17, 2006 • 8:00 A.M. TO 2:30 P.M. • LOCATION: SANTA DOMINGO ROOM (CONVENTION CENTER)

*Sponsored by the Nuclear Criticality Safety Division
Supported by the Nuclear Criticality Safety Program (NCSP)*

PURPOSE

The NCSP is a comprehensive, crosscutting program that integrates the need to maintain the US criticality safety infrastructure with effective support for criticality safety programs throughout the DOE complex. This workshop, while not part of the official ANS program, has been arranged through the courtesy of the ANS Headquarters staff. The presentations are based on the DOE NCS Program, but because of the global application of the work supported by the DOE NCSP, feedback is encouraged from anyone interested in the needs of a diverse, well-organized criticality safety program in support of operations. Extensive audience participation is encouraged and anticipated.

SCOPE

For this workshop, NCSP solicits input concerning ways to improve the ability of criticality safety practitioners to utilize NCSP products and thus better provide criticality safety support at their sites. NCSP seeks answers to the questions:

Are existing tools, information, and approaches adequate to supply the needs for fissile material handling, storage and processing in the following areas.

- Nuclear Criticality Analysis Tools
- Nuclear Criticality data and databases
- Benchmark experiments and subcritical measurements
- Analyses and parameter studies
- Engineered safety approaches
- Simulation and monitoring techniques
- Resources and manpower requirements
- GNEP with Emphasis on the Advanced Fuel Cycle Facility
- 2030 Complex and the Role of the Critical Experiments Facility at the DAF

At this workshop, the Enduser group will discuss the status of current initiatives presented at the last workshop in June, 2006, and propose new initiatives. Working groups will then meet to address these topics, including identified needs and proposed actions, to enhance criticality safety programs across the DOE complex. Current initiatives include:

- 1) Operator training simulator
- 2) How to best track materials
- 3) Sharing lessons learned
- 4) Neutron physics data area
- 5) Computer code features

Initial presentations will be followed by the break-out of working groups and group participation. Interested criticality safety practitioners are welcome to participate.

COORDINATORS

Adolf Garcia, Mike Westfall, Robert Wilson, Hans Toffer, Todd Taylor, John Pearson, James Morman, Blair Briggs and David Heinrichs

PROGRAM

8:00 am	Welcome and expectations for the workshop
8:15 am	Overview of 2030 Complex Vision and the Role of CEF/DAF
8:45 am	Nuclear Criticality Support to Meet Needs of GNEP
9:15 am	Working group break-out sessions
11:00 am	Working group reports, summary of progress
12:00 pm	LUNCH
12:45 pm	Working group reports, summary of progress
2:00 pm	Closing Remarks
2:30 pm	Adjourn

CONTACTS

Dr. Jerry N. McKamy, NCSP Manager
Todd Taylor, End-User Chair

Committee Meetings

NATIONAL COMMITTEES

Accreditation Policies and Procedures

SUNDAY, 5:00 P.M. – 7:00 P.M.
LOCATION: Ruidoso (Convention Center)

Board of Directors

Professional Division Reports

WEDNESDAY, 4:00 P.M. – 5:30 P.M.
LOCATION: Ballroom C (Convention Center)

Board of Directors

THURSDAY, 8:00 A.M. – 5:00 P.M.
LOCATION: Ballroom C (Convention Center)

Bylaws & Rules

SUNDAY, 1:30 P.M. – 4:00 P.M.
LOCATION: Nambe (Convention Center)

Executive Conference Review

SUNDAY, 10:30 A.M. – 12:00 P.M.
LOCATION: Nambe (Convention Center)

Finance

TUESDAY, 4:00 P.M. – 7:00 P.M.
LOCATION: Enchantment 1 (Convention Center)

Honors and Awards

MONDAY, 4:00 P.M. – 7:00 P.M.
LOCATION: Tijeras (Convention Center)

International

SUNDAY, 1:30 P.M. – 4:30 P.M.
LOCATION: Mesilla (Convention Center)

Local Sections/Workshop

SUNDAY, 8:00 A.M. – 12:00 P.M.
LOCATION: Ruidoso (Convention Center)

Membership

SUNDAY, 11:00 A.M. – 1:00 P.M.
LOCATION: Zuni (Convention Center)

National Program Committee (NPC)

Program

WEDNESDAY, 4:00 P.M. – 7:00 P.M.
LOCATION: Enchantment 1 & 2 (Convention Center)

Screening & International

MONDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Mesilla (Convention Center)

NEED

SUNDAY, 7:30 P.M. – 9:30 P.M.
LOCATION: Zuni (Convention Center)

Planning

SUNDAY, 2:00 P.M. – 6:00 P.M.
LOCATION: Zuni (Convention Center)

President's Meetings

with Committee Chairs

SUNDAY, 9:00 A.M. – 10:30 A.M.
LOCATION: Cochiti/Taos (Convention Center)

with Division Chairs

SUNDAY, 10:30 A.M. – 11:30 A.M.
LOCATION: Cochiti/Taos (Convention Center)

Professional Development Workshop

TUESDAY, 7:30 A.M. – 8:30 A.M.
LOCATION: Enchantment 1 (Convention Center)

Professional Divisions

TUESDAY, 4:00 P.M. – 6:30 P.M.
LOCATION: Fiesta (Hyatt Regency)

Professional Engineering Exam

SUNDAY, 3:00 P.M. – 6:00 P.M.
LOCATION: Tesuque (Convention Center)

Professional Women in ANS

MONDAY, 11:30 A.M. – 1:00 P.M.
LOCATION: Tijeras (Convention Center)

Public Information

SUNDAY, 3:30 P.M. – 5:30 P.M.
LOCATION: Navajo (Convention Center)

Public Policy

WEDNESDAY, 11:30 A.M. – 1:30 P.M.
LOCATION: Enchantment 1 (Convention Center)

Publications Steering

Book Publishing

SUNDAY, 11:00 A.M. – 12:00 P.M.
LOCATION: Navajo (Convention Center)

Meetings, Proceedings and Transactions

MONDAY, 7:30 A.M. – 8:30 A.M.
LOCATION: Tijeras (Convention Center)

NS&E Editorial Advisory Board

SUNDAY, 9:00 A.M. – 10:00 A.M.
LOCATION: Navajo (Convention Center)

NT Editorial Advisory Board

SUNDAY, 10:00 A.M. – 11:00 A.M.
LOCATION: Navajo (Convention Center)

Nuclear News Editorial Advisory

SUNDAY, 4:00 P.M. – 5:30 P.M.
LOCATION: Nambe (Convention Center)

Publications Steering

Publications Steering

MONDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Cimmaron (Convention Center)

Technical Journals

SUNDAY, 1:00 P.M. – 3:30 P.M.
LOCATION: Navajo (Convention Center)

Scholarship Policy & Coordination

TUESDAY, 4:00 P.M. – 5:00 P.M.
LOCATION: Enchantment 2 (Convention Center)

Student Sections

Executive

MONDAY, 6:00 P.M. – 7:00 P.M.
LOCATION: Nambe/Navajo (Convention Center)

Reports/Roundtable

MONDAY, 7:00 P.M. – 8:00 P.M.
LOCATION: Nambe/Navajo (Convention Center)

SPECIAL COMMITTEES

Development

TUESDAY, 1:30 P.M. – 3:00 P.M.
LOCATION: Enchantment A (Hyatt Regency)

Nuclear Nonproliferation

SUNDAY, 2:00 P.M. – 4:00 P.M.
LOCATION: Enchantment 2 (Convention Center)

OTHER COMMITTEES

CNF

MONDAY, 7:30 P.M. – 10:00 P.M.
LOCATION: Cimmaron (Convention Center)

DOE Marketing

MONDAY, 2:30 P.M. – 4:00 P.M.
LOCATION: Enchantment D (Hyatt Regency)

Eagle Alliance Board of Directors

SUNDAY, 1:00 P.M. – 3:30 P.M.
LOCATION: Enchantment 1 (Convention Center)

IEEE SC5 Meeting

THURSDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Sandia (Convention Center)

Committee Meetings

INSC

SUNDAY, 8:00 A.M. – 5:00 P.M.
LOCATION: Laguna (Convention Center)

Mathematics & Computation/ Reactor Physics/ Radiation Protection & Shielding Joint Benchmark Meeting

SUNDAY, 11:00 A.M. – 1:00 P.M.
LOCATION: Tesuque (Convention Center)

NEDHO

MONDAY, 4:30 P.M. – 6:00 P.M.
LOCATION: Enchantment 1 (Convention Center)

North American Energy Working Group

WEDNESDAY, 1:00 P.M. – 4:00 P.M.
LOCATION: Enchantment F - (Hyatt Regency)

Special Interest Group on Computerized Procedures

WEDNESDAY, 4:30 P.M. – 5:30 P.M.
LOCATION: Enchantment E (Hyatt Regency)

UWC 2007 Planning Committee

SUNDAY, 12:00 P.M. – 12:30 P.M.
LOCATION: Picuris (Convention Center)

World Nuclear University Planning

TUESDAY, 2:00 P.M. – 4:00 P.M.
LOCATION: Enchantment B (Hyatt Regency)

DIVISION COMMITTEES

Accelerator Applications

Executive
MONDAY, 11:30 A.M. – 1:30 P.M.
LOCATION: Aztec (Convention Center)

Aerospace Nuclear Science and Technologies

SUNDAY, 12:00 P.M. – 2:00 P.M.
LOCATION: Ruidoso (Convention Center)

Biology & Medicine

Committee of the Whole
SUNDAY, 4:00 P.M. – 5:30 P.M.
LOCATION: Apache (Convention Center)

Biology & Medicine

Computational Medical Physics Working Group
SUNDAY, 4:15 P.M. – 5:45 P.M.
LOCATION: Tijeras (Convention Center)

Decommissioning, Decontamination & Reutilization

Committee Meeting
SUNDAY, 1:00 P.M. – 5:00 P.M.
LOCATION: Sandia (Convention Center)

Education & Training

Alpha Nu Sigma
SUNDAY, 1:00 P.M. – 2:00 P.M.
LOCATION: Santo Domingo (Convention Center)

Executive/Membership/Honors & Awards

SUNDAY, 1:30 P.M. – 4:00 P.M.
LOCATION: Apache (Convention Center)

Nuclear Workforce Working Group

SUNDAY, 12:00 P.M. – 1:00 P.M.
LOCATION: Santo Domingo (Convention Center)

Program

SUNDAY, 10:30 A.M. – 12:00 P.M.
LOCATION: Santo Domingo (Convention Center)

University/Industry/Government Relations

SUNDAY, 9:30 A.M. – 10:30 A.M.
LOCATION: Santo Domingo (Convention Center)

Environmental Sciences

Executive
SUNDAY, 10:00 A.M. – 2:30 P.M.
LOCATION: Aztec (Convention Center)

Nuclear Production of Hydrogen Working Group, Membership/Executive

SUNDAY, 3:30 P.M. – 6:00 P.M.
LOCATION: Aztec (Convention Center)

Program

SUNDAY, 8:30 A.M. – 10:00 A.M.
LOCATION: Aztec (Convention Center)

Fuel Cycle & Waste Management

Executive
SUNDAY, 3:30 P.M. – 5:30 P.M.
LOCATION: Dona Ana (Convention Center)

Program

SUNDAY, 1:30 P.M. – 3:30 P.M.
LOCATION: Dona Ana (Convention Center)

Technical Operating Committee

SUNDAY, 12:00 P.M. – 1:30 P.M.
LOCATION: Dona Ana (Convention Center)

Fusion Energy

Executive
SUNDAY, 3:00 P.M. – 5:00 P.M.
LOCATION: Ruidoso (Convention Center)

Human Factors

Executive/Program
WEDNESDAY, 5:30 P.M. – 7:00 P.M.
LOCATION: Enchantment C (Hyatt Regency)

Isotopes & Radiation

Executive
SUNDAY, 2:30 P.M. – 4:00 P.M.
LOCATION: Cochiti (Convention Center)

Joint Program Committee – I&R & B&M

SUNDAY, 1:30 P.M. – 2:30 P.M.
LOCATION: Cochiti (Convention Center)

Materials Science & Technology

Executive
MONDAY, 7:00 P.M. – 9:00 P.M.
LOCATION: Tijeras (Convention Center)

Mathematics & Computation

Executive
SUNDAY, 2:00 P.M. – 4:00 P.M.
LOCATION: Tijeras (Convention Center)

Program

SUNDAY, 1:00 P.M. – 2:00 P.M.
LOCATION: Tijeras (Convention Center)

Nuclear Criticality Safety

CSSG
MONDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Enchantment 2 (Convention Center)

Education Meeting

SUNDAY, 1:00 P.M. – 1:30 P.M.
LOCATION: Pecos (Convention Center)

Executive

SUNDAY, 2:30 P.M. – 4:00 P.M.
LOCATION: Pecos (Convention Center)

Program

SUNDAY, 1:30 P.M. – 2:30 P.M.
LOCATION: Pecos (Convention Center)

Nuclear Installation Safety

Executive
MONDAY, 5:00 P.M. – 8:00 P.M.
LOCATION: Aztec (Convention Center)

Committee Meetings

Nuclear Installation Safety

Program

SUNDAY, 7:30 P.M. – 11:00 P.M.
LOCATION: Picuris (Convention Center)

Operations & Power

Executive

SUNDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Picuris (Convention Center)

Nuclear Construction Working Group

SUNDAY, 2:30 P.M. – 4:00 P.M.
LOCATION: Picuris (Convention Center)

Program

SUNDAY, 12:30 P.M. – 2:30 P.M.
LOCATION: Picuris (Convention Center)

Radiation Protection & Shielding

Executive

MONDAY, 5:00 P.M. – 6:30 P.M.
LOCATION: Pecos (Convention Center)

Program

MONDAY, 4:00 P.M. – 5:00 P.M.
LOCATION: Pecos (Convention Center)

Reactor Physics

Executive

SUNDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: San Miguel (Convention Center)

Program

SUNDAY, 2:00 P.M. – 4:00 P.M.
LOCATION: San Miguel (Convention Center)

Robotics & Remote Systems

Executive

SUNDAY, 12:00 P.M. – 4:30 P.M.
LOCATION: Santa Ana (Convention Center)

Thermal Hydraulics

Award Ceremony

TUESDAY, 4:00 P.M. – 5:00 P.M.
LOCATION: Taos (Convention Center)

Executive

SUNDAY, 5:00 P.M. – 7:00 P.M.
LOCATION: Acoma (Convention Center)

Nueth-12 Planning

SUNDAY, 1:00 P.M. – 3:00 P.M.
LOCATION: Acoma (Convention Center)

Program

SUNDAY, 3:00 P.M. – 5:00 P.M.
LOCATION: Acoma (Convention Center)

Young Member Group

Executive Committee

SUNDAY, 7:00 A.M. – 8:30 A.M.
LOCATION: Navajo (Convention Center)

STANDARDS COMMITTEES

ANS Standards Board

TUESDAY, 9:00 A.M. – 5:00 P.M.
LOCATION: Enchantment F (Hyatt Regency)

ANS-6.1.1

MONDAY, 7:30 A.M. – 8:30 A.M.
LOCATION: Enchantment B (Hyatt Regency)

ANS-8.1

TUESDAY, 7:00 A.M. – 8:30 A.M.
LOCATION: Enchantment A (Hyatt Regency)

ANS-8.3

SUNDAY, 9:00 A.M. – 12:00 P.M.
LOCATION: Enchantment A (Hyatt Regency)

ANS-8.20

MONDAY, 7:00 A.M. – 8:30 A.M.
LOCATION: Enchantment E (Hyatt Regency)

THURSDAY, 7:00 A.M. – 8:30 A.M.

LOCATION: Enchantment E (Hyatt Regency)

ANS-8.21

TUESDAY, 7:00 A.M. – 8:30 A.M.
LOCATION: Enchantment B (Hyatt Regency)

THURSDAY, 7:00 A.M. – 8:30 A.M.

LOCATION: Enchantment B (Hyatt Regency)

ANS-8.23

THURSDAY, 1:00 P.M. – 5:00 P.M.
LOCATION: Enchantment B (Hyatt Regency)

ANS-8.25

WEDNESDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Enchantment A (Hyatt Regency)

ANS-8.26

WEDNESDAY, 7:30 A.M. – 8:30 A.M.
LOCATION: Enchantment A (Hyatt Regency)

ANS-8.27

MONDAY, 8:30 A.M. – 5:00 P.M.
LOCATION: Enchantment F (Hyatt Regency)

ANS-10.4

WEDNESDAY, 6:00 P.M. – 9:00 P.M.
LOCATION: Enchantment B (Hyatt Regency)

ANS-19, Physics of Reactor Design

MONDAY, 8:30 A.M. – 10:30 A.M.
LOCATION: Enchantment A (Hyatt Regency)

ANS-19.3

MONDAY, 4:00 P.M. – 6:00 P.M.
LOCATION: Enchantment B (Hyatt Regency)

ANS-28/ANS 53.1

WEDNESDAY, 8:00 A.M. – 5:00 P.M.
LOCATION: Enchantment C (Hyatt Regency)

THURSDAY, 8:00 A.M. – 12:00 P.M.

LOCATION: Enchantment C (Hyatt Regency)

ANS-51.1/52.1/58.14

TUESDAY, 8:00 A.M. – 5:00 P.M.
LOCATION: Enchantment C (Hyatt Regency)

ANS-58.23

TUESDAY, 8:00 A.M. – 5:00 P.M.
LOCATION: Enchantment E (Hyatt Regency)

WEDNESDAY, 8:00 A.M. – 5:00 P.M.

LOCATION: Enchantment D (Hyatt Regency)

THURSDAY, 8:00 A.M. – 5:00 P.M.

LOCATION: Enchantment D (Hyatt Regency)

N16 Committee

MONDAY, 1:00 P.M. – 5:00 P.M.
LOCATION: Enchantment A (Hyatt Regency)

NFSC

MONDAY, 8:30 A.M. – 6:00 P.M.
LOCATION: Enchantment C & D (Hyatt Regency)

RISC

WEDNESDAY, 8:00 A.M. – 6:00 P.M.
LOCATION: Enchantment B (Hyatt Regency)

NOTE:

Some afternoon committee meetings will be held in rooms that follow a technical session. The technical sessions must be allowed to finish prior to entering the room to begin the committee meeting.

ANS Nuclear Technology Expo

ANS NUCLEAR TECHNOLOGY EXPO

Sunday, November 12

6:00 p.m. - 7:30p.m.

(ANS President's Reception)

Monday, November 13

11:30 a.m. - 6:00 p.m.

(Luncheon • Caricaturist • Prizes • Welcome Reception)

Tuesday, November 14

10:00 a.m. - 2:00 p.m.

(Concession Lunch • Caricaturist • Prizes)

The ANS Nuclear Technology Expo will be held November 12-14 in the Southwest Exhibit Hall of the Albuquerque Convention Center.

The Expo will open Sunday from 6:00 p.m. - 7:30p.m. for the ANS President's Reception. Many other special events will take place in the Hall on Monday and Tuesday.

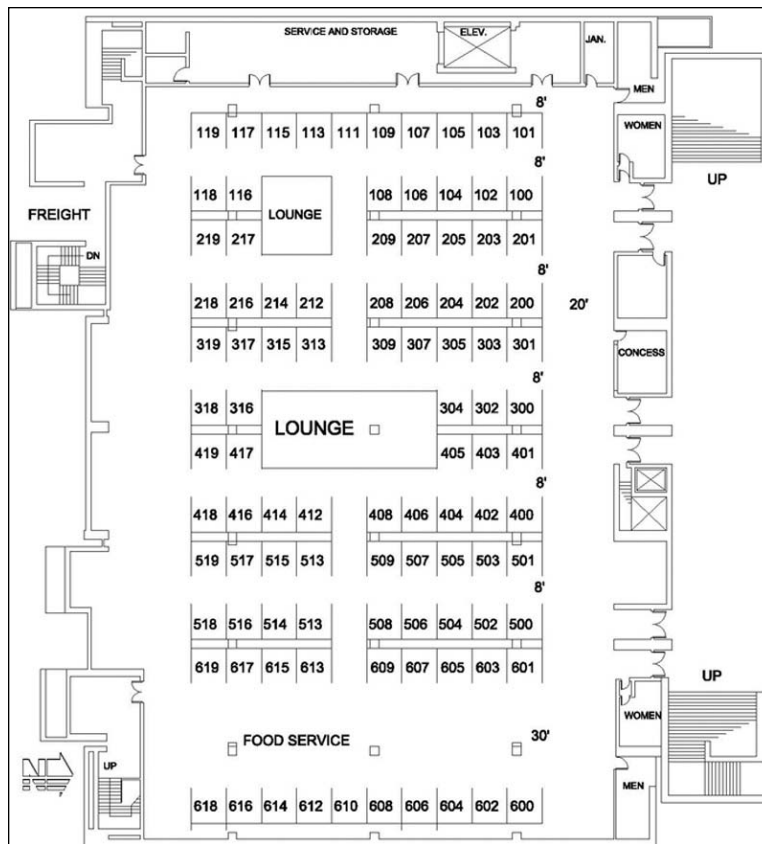
Representatives from leading organizations will be available to answer your questions about their innovative products and services. A list of exhibitors follows.

Aaron Corporation	315
ALDEN Research Laboratory, Inc.	105
AMEASOL, BROKK, LUCAS and STUDSVIK	201, 203
American Crane & Equipment Corporation	205
American Nuclear Society	101, 103
American Signal Corporation	113
American Tank & Fabricating Co.	500
Analysis and Measurement Services Corporation	403
ANSALDO Camozzi	507
AREVA	400, 402
Barnhart Nuclear Services	513
Bartlett Nuclear, Inc.	109
Bechtel Nuclear Power	412, 414
Bechtel SAIC Company, LLC	605
Bigge Power Constructors	307
Black & Veatch	219
BWX Technologies, Inc.	207, 209
CARAN Precision	100
Dade Moeller & Associates, Inc.	518
Data Systems & Solutions, LLC	601

DELTA M Corporation	502
Doosan HF Controls Corporation	416
EaglePicher Boron	313
EDO Defense Systems	106
EnergySolutions	615
EXCEL Services Corporation	316, 318, 417, 419
GE Nuclear Energy	515
GNEP/U.S. DOE Office of Nuclear Energy	301, 303
Hamilton Sundstrand Space, Land & Sea – Rocketdyne	300, 302
Hitachi America, Ltd.	617
Hukari Technical Services, Inc.	509
IAEA/Brookhaven National Laboratory	104
INL Idaho National Laboratory	317, 319, 517, 519
Invensys Nuclear	504
ISTC International Science & Technology Center	111
Kleinfelder, Inc.	516
LND, Inc.	404
Los Alamos National Laboratory	117
Major Tool & Machine, Inc.	401
Mega-Tech Services, Inc.	309
Mitsubishi Heavy Industries, Ltd.	214, 216
Mohawk Safety/LTI	514
MPR Associates, Inc.	115
National Atomic Museum	212
Newport News Industrial	405
North American Young Generation in Nuclear (NA-YGN)	603
NRG	119
Nuclear Filter Technology	619
Nuclear Management Company, LLC	218
Nuclear News/Radwaste Solutions	101, 103
Nuclear Plant Journal	305
Oak Ridge National Laboratory	200, 202
OECD Nuclear Energy Agency	204
Private Fuel Storage, LLC	304
Rigging International	118
Sandia National Labs	116
Sandia National Labs/LANL	107
SOLTEC Corporation	206, 208
Sonalysts, Inc.	102
Stäubli Corporation	406
Super Radiator Coils	501
Thermocoax Inc.	108
Thermo Electron, CIDTEC Cameras & Imagers	408
Transpire, Inc.	503
University of Missouri – Columbia	418
U.S. Nuclear Regulatory Commission	217
Westinghouse Electric Company	505

ANS Nuclear Technology Expo

FLOOR PLAN: Southwest Exhibit Hall - Albuquerque Convention Center



We thank the following companies for their generous support of the ANS Expo Special Events:

Bechtel Nuclear Power

(Attendee Prizes)

BWX Technologies, Inc.

(Welcome Reception)

Doosan HF Controls Corporation

(Refreshment Break)

EXCEL Services Corporation

(Grand Prizes)

Hukari Technical Services, Inc.

(Welcome Reception)

ISTC International Science & Technology Center

(Welcome Reception)

Mitsubishi Heavy Industries, Ltd.

(Welcome Reception)

Private Fuel Storage LLC

(Caricaturist)

For information regarding the ANS Nuclear Technology Expo, contact Sharon Bohlander at 1-800-250-3678 or visit www.earlbeckwith.com



American Nuclear Society meetings and conferences are the best way to keep current with the ever changing fields of nuclear science and technology.

3 WAYS TO KEEP UP-TO-DATE

- 1) The national meetings feature comprehensive technical programs, professional development workshops, exhibits and special events
- 2) Executive conferences and workshops focus on timely issues and topics regarding the implementation, operation and regulation of the nuclear industry
- 3) Topical meetings provide in-depth coverage of selected technical subjects

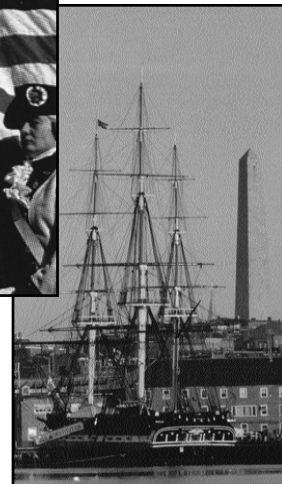
The opportunity to meet other professionals and discuss issues with recognized authorities will enrich your professional development.

Make plans now to attend!

(top right) Boston has a long and rich historical past that dates back to the 1700s. Two main events which happened in the city and helped America win the Revolutionary War were, The Boston Tea Party, December 16, 1773, and the first public reading of The Declaration of Independence, spoken from the balcony of the Boston State House on July 18, 1776.



Boston Red Sox Stadium, Boston Massachusetts



One of the great sights of Boston, Boston Harbor

2007 NATIONAL MEETINGS

DATE	TITLE	LOCATION
Jun 24-28, 2007	2007 ANS ANNUAL MEETING <i>"It's All About the People: The Future of Nuclear"</i> EMBEDDED TOPICAL MEETING SAFETY AND TECHNOLOGY OF NUCLEAR HYDROGEN PRODUCTION, CONTROL AND MANAGEMENT (ST-NH2) EMBEDDED TOPICAL MEETING SPACE NUCLEAR CONFERENCE 2007 (SNC '07)	Boston, Massachusetts <i>Boston Marriott Copley</i>
Nov 11-15, 2007	2007 ANS/ENS INTERNATIONAL MEETING AND NUCLEAR TECHNOLOGY EXPO	Washington, DC <i>Omni Shoreham Hotel</i>

2007 TOPICAL AND OTHER IMPORTANT MEETINGS

DATE	TITLE	LOCATION
Feb 4-7, 2007	CONFERENCE ON NUCLEAR TRAINING AND EDUCATION (CONTE 07)	Jacksonville, Florida <i>Hyatt Regency Jacksonville Riverfront</i>
Apr 15-19, 2007	JOINT INTERNATIONAL TOPICAL MEETING ON MATHEMATICS & COMPUTATIONS AND SUPERCOMPUTING IN NUCLEAR APPLICATIONS (M&C + SNA2007)	Monterey, California <i>Monterey Marriott</i>
Jul 30 - Aug 2, 2007	EIGHTH INTERNATIONAL TOPICAL MEETING ON NUCLEAR APPLICATIONS AND UTILIZATION OF ACCELERATORS (ACCAPP '07)	Pocatello, Idaho <i>Idaho State University</i>
Aug 5-8, 2007	UTILITY WORKING CONFERENCE AND VENDOR TECHNOLOGY EXPO	Amelia Island, Florida <i>Amelia Island Plantation</i>
Sept 9-13, 2007	GLOBAL '07 <i>"Advanced Nuclear Fuel Cycles and Systems"</i>	Boise, Idaho <i>Boise Convention Center</i>
Sept 16-19, 2007	DECOMMISSIONING DECONTAMINATION & REUTILIZATION (DD&R2007) AND TECHNOLOGY EXPO <i>"Capturing Decommissioning Lessons Learned"</i>	Chattanooga, Tennessee <i>The Chattanooga Hotel</i>
Sept 30 - Oct 4, 2007	TWELFTH INTERNATIONAL TOPICAL MEETING ON NUCLEAR REACTOR THERMAL-HYDRAULICS (NURETH-12)	Pittsburgh, Pennsylvania
Sept 30 - Oct 3, 2007	2007 LWR FUEL PERFORMANCE MEETING/TOP FUEL	San Francisco, California <i>Grand Hyatt Hotel</i>