PRELIMINARY PROGRAM

52nd Annual Meeting of the Health Physics Society
(American Conference of Radiological Safety)
21st Biennial Campus Radiation Safety Officers Meeting

July 8-12, 2007
Portland DoubleTree/Oregon Convention Center
Portland, Oregon
Key Dates

Current Events/Works-In-Progress Deadline ........................................... May 28
Hotel Registration Deadline ................................................................. June 6
Social/Technical Preregistration Deadline ............................................ June 8
HPS Annual Meeting Preregistration Deadline ...................................... June 8
PEP Preregistration Deadline ............................................................... June 8
Professional Development School Registration Deadline ....................... June 8
AAHP Courses ......................................................................................... July 7
Professional Enrichment Program ......................................................... July 8-11
HPS 52nd Annual Meeting ................................................................... July 8-12
American Board of Health Physics Written Exam ............................... July 9
2007 HPS Professional Development School ........................................... July 13-16

Registration Hours and Location

Registration at the DoubleTree Hotel:
Saturday, July 7 ......................................................................................... 2:00 - 5:00 pm
Sunday, July 8 ........................................................................................... 7:00 am - 7:00 pm

Registration at the Oregon Convention Center:
Monday, July 9 .......................................................................................... 8:00 am - 4:00 pm
Tuesday, July 10 ......................................................................................... 8:00 am - 4:00 pm
Wednesday, July 11 .................................................................................. 8:00 am - 4:00 pm
Thursday, July 12 ....................................................................................... 8:00 am - Noon

Saturday and Sunday
AAHP courses and PEPs take place at the
Portland DoubleTree Hotel, Lloyd Center

Monday - Thursday
All Sessions, CELs and PEPs take place in
the Oregon Convention Center

HPS Secretariat
1313 Dolley Madison Blvd.
Suite 402
McLean, VA 22101
(703) 790-1745; FAX: (703) 790-2672
Email: hps@burkinc.com; Web Page: www.hps.org
CURRENT EVENTS/WORKS-IN-PROGRESS

The submission form for the Current Events/Works-in-Progress poster session is on the Health Physics Society web site at www.hps.org under the Portland Annual Meeting section. The deadline for submissions is Monday, May 28, 2007. All presentations will take place as posters on Monday, July 9, between 1:30-3:30 pm. Individuals will be notified of acceptance of their WIP submissions by the end of May.

For questions regarding WIP submissions, contact Sue Burk or Lori Strong at the HPS Secretariat at 703-790-1745 or sburk@burkinc.com/lstrong@burkinc.com.

NOTE FOR CHPs

The American Academy of Health Physics has approved the following meeting-related activities for Continuing Education Credits for CHPs:

• Meeting attendance is granted 2 CECs per half day of attendance, up to 12 CECs;
• AAHP 8 hour courses are granted 16 CECs each;
• HPS 2 hour PEP courses are granted 4 CECs each;
• HPS 1 hour CELs are granted 2 CECs each.
### Saturday, July 7

**AAHP 1**
Eight-hour OSHA Hazardous Waste Operations Refresher Training  
8:00 am-5:00 pm  
DoubleTree

**AAHP 2**
Emergency Dose Assessment  
8:00 am-5:00 pm  
DoubleTree

**AAHP 3**
Homeland Security Instrumentation for the Health Physicist  
8:00 am - 5:00 pm  
DoubleTree

### Sunday, July 8

**PEP 1-A thru 1-H**  
8:00-10:00 am

**PEP 2-A thru 2-H**  
10:30 am-12:30 pm

**PEP 3-A thru 3-H**  
2:00-4:00 pm

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**Welcome Reception**  
6:00-7:00 pm  
DoubleTree

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All Events are in the Convention Center or DoubleTree Hotel

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Saturday/Sunday  
AAHP courses and PEPs take place at the Portland DoubleTree Hotel, Lloyd Center

Monday - Thursday  
All Sessions, CELs and PEPs take place in the Oregon Convention Center

### Monday, July 9

**CE1**  
Workforce Pipelines for the Nuclear Renaissance  
7:00-8:00 am  
A105

**CE2**  
Medical Reserve Corps (MRC) – volunteer opportunity for health physicists to contribute to their local communities  
7:00-8:00 am  
A106

**ABHP Exam - Part 1**  
8:00-11:00 am  
DoubleTree

**MAM-A Plenary Session**  
8:15 am-Noon  
Oregon Ballroom 201/202

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits  
Noon - 1:30 pm  
Exhibit Hall

**PEP Program**  
12:15-2:15 pm

**PEP M1**  
Basic Statistics

**PEP M2**  
Design, Fabrication, and Use of Anthropometric Phantoms for Calibrating Direct In Vivo Measurements of Internally-Deposited Radioactive Materials

**PEP M3**  
Cell and Molecular Effects of Low Doses of Radiation

**PEP M4**  
Training for Medical Examiners and Coroners in Handling fatalities from INDs

**PEP M5**  
Technical Auditing for Health Physicists (Part 1 of 3 on Laboratory Accreditation, See PEPs T5 and W5)

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**ABHP Exam - Part II**  
12:30 - 6:30 pm  
DoubleTree

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**HPS Chapter Council**  
1:00 - 2:00 pm  
B113-114

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**Poster Session**  
1:30 - 3:30 pm  
Exhibit Hall

**MMP-A**  
NIOSH Dose Reconstruction Project  
3:30-5:00 pm  
A105

**MMP-B**  
Reactor Health Physics  
3:30-5:00 pm  
A106

**MMP-C**  
Regulatory/Legal Issues  
3:30-5:15 pm  
B110-112

**MMP-D**  
First Responders  
3:30-4:15  
B113-114

**MMP-E**  
Waste Management  
3:30-5:00 pm  
B115-116

**Movies**  
3:30-5:00 pm  
B117-119

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**Student Reception**  
5:30 - 6:30 pm  
DoubleTree

### Tuesday, July 10

**CE3**  
ON ALERT: Post 9/11 Integrated Emergency Planning  
7:00-8:00 am  
A105

**CE4**  
Image-Based Methods in Internal Dose Calculations – Current Status  
7:00-8:00 am  
A106

**TAM-A**  
AAHP Special Session on HP Education  
8:30 am-Noon  
A105

**TAM-B**  
External Dosimetry A  
8:30 am-Noon  
A106

**TAM-C**  
Medical Health Physics  
8:30 am-Noon  
B110-112

**TAM-D**  
Community Preparedness for Radiological Terrorism Response Special Session  
8:00 am-Noon  
B113-114

**TAM-E**  
Environmental Special Session  
8:30 am-Noon  
B115-116

**TAM-F**  
Uncertainty Special Session - Sponsored by the Decommissioning Section  
8:30 am-Noon  
B117-119

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**AAHP Awards Luncheon**  
Noon-2:15 pm  
TBD

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**PEP Program**  
12:15-2:15 pm

**PEP T1**  
Choosing Radiological Performance Indicators

**PEP T2**  
Radiological Design Review of Radiological Facilities and Equipment

**PEP T3**  
Statistics – What Is It Good For? (A Practical Primer for the Practicing Professional)

**PEP T4**  
Environmental Radioactivity Studies at the Savannah River Ecology Laboratory: Transport, Remediation, and Effects Research

**PEP T5**  
HPS Laboratory Accreditation Program Assessor Training (Part 2 of 3 on Laboratory Accreditation, See PEPs M5 and W5)

**TPM-A**  
AAHP Special Session on HP Education  
2:30-5:15 pm  
A105

**TPM-B**  
External Dosimetry B  
2:30-3:45 pm  
A106

**TPM-C**  
Decommissioning  
2:30-5:00 pm  
B110-112

**TPM-D**  
Community Preparedness for Radiological Terrorism Response Special Session  
2:30-4:30 pm  
B113-114

**TPM-E**  
CRS Plenary Session  
2:30-5:00 pm  
B115-116

**Movies**  
2:30-5:00 pm  
B117-119

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**AAHP Open Meeting**  
5:15 pm  
A105

**HPS Awards Dinner & Reception**  
7:00-10:00 pm  
Convention Center
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- AAHP 8 hour courses are granted 16 CECs each;
- HPS 2 PEP courses are granted 4 CECs each;
- HPS 1 hour CELs are granted 2 CECs each.

### Registration Hours

- **DoubleTree Hotel**
  - Saturday: 2:00 - 5:00 pm
  - Sunday: 7:00 am - 7:00 pm

- **Convention Center**
  - Monday: 8:00 am - 4:00 pm
  - Tuesday: 8:00 am - 4:00 pm
  - Wednesday: 8:00 am - 4:00 pm
  - Thursday: 8:00 - 10:00 am

### Exhibit Hall Hours

- Monday: Noon - 5:00 pm
- Tuesday: 9:30 am - 5:30 pm
- Wednesday: 9:30 am - Noon
Officers
Brian Dodd, President
Kevin L. Nelson, President Elect
Richard R. Brey, Secretary
Kathryn H. Pryor, Secretary Elect
David J. Allard, Treasurer
Ruth E. McBurney, Past President
Richard J. Burk, Jr., Executive Secretary

Board of Directors
Joseph L. Alvarez
Armin Ansari
Lisa M. Bosworth
Nolan Hertel
Eva E. Hickey
Michael Lewandowski
Kathleen L. Shingleton
Ali Simpkins
Robert C. Whitcomb, Jr.

Local Arrangements Committee
Co-Chairs: Janet Franco, Jennifer Johnson
Hospitality Suite - Phil Campbell, John Gough
Intramurals - Mike Zittle, Bill Zander
Night Out - Bruce Busby, John Gough, Drew Thatcher
PEP Liaison - Carl Bergsagel, Debra McBaugh
Publicity Midyear Meeting 2006 - Wayne Lei, Rick Tombilson
Publicity & Local Information - Rick Edwards, Marge Slauson, Bill Tuttle, Lar Winans
Receptions - Rick Tomlison, Jerry Cooper, Mike Stewart
Revenue - Terry Lindsey, Dan Harlan, Anine Grumbles, Martha Dibblee
Science Tours - Rainier Farmer, Mike Stewart
Social Tours - Bill Tuttle, Lar Winans, Phil Campbell, Justin Spence
Souvenirs - Terry Lindsey, Dan Harlan, Martha Dibblee, Anine Grumbles
Treasurer - Dan Harlan
Treasurer Advisor - Norm Dyer
Volunteer Coordinators - Terry Lindsey, Marge Slauson
Webmaster - Bruce Busby, Phil Campbell

Program Committee
Chairperson: Christopher Martel
Robert N. Cherry, Jr.
Julie Ann Clements
Jason T. Flora
Philip D. Kearney
Kenneth Krieger
Patricia L. Lee
Matthew C. McCue
Mary Ann Parkhurst
Laura Pring
Heidi Walton

2007 Task Force - Portland
Chairperson: Kenneth Krieger
Jennifer Johnson
Philip D. Kearney
Patricia L. Lee
Laura Pring
Matthew C. McCue

2007 Exhibitors
(as of 3/15)
Alpha Spectra, Inc.
American Nuclear Society
Analytics, Inc.
Arrow-Tech Inc.
Berkeley Nucleonics Corp.
Bionomics, Inc.
Bladewerx LLC
Canberra Industries
Chase Environmental Group Inc.
Chesapeake Nuclear
Dade Moeller & Associates
Eckert & Ziegler Isotope Products
F&J Specialty Products, Inc.
Fluke Biomedicals
Framework Scientific
G/O Corporation
Gamma Products, Inc.
General Engineering Labs, Inc.
Global Dosimetry Solutions, Inc
Health Physics Instruments
HI-Q Environmental Products Co.
Hopewell Designs, Inc.
Illinois Institute Of Technology
J. L. Shepherd & Assoc.
Lab Impex Systems Ltd.
Lancs Industries, Inc.
Landauer Inc.
Laser-Professionals Inc.
Ludlum Measurements, Inc.
MACTEC, INC.
MGP Instruments
MJW Corporation
North American Scientific
On Site Systems, Inc.
Philetchnics, Ltd.
Protean Instrument Corporation
QSA Global
RADECO
Radiation Detection Company
Radiation Safety & Control Services Inc.
Radiation Safety Associates
S. E. International, Inc.
Saint-Gobain Crystals Scintillation Products
Scionix
Supertech, Inc.
Technical Associates
Thermo Fisher Scientific
Thomas Gray & Associates, Inc.
TSA Systems, Ltd.
U.S. Nuclear Regulatory Commission
XRF Corporation
**Different This Year**

**Joint Meeting with the CRSO**
The CRSO will hold its Opening Plenary Session Tuesday afternoon. A joint session will be held Wednesday morning with the HPS RSO section. The CRSO will hold two concurrent sessions on Wednesday afternoon and Thursday morning.

**Things to Remember!**

All Speakers are required to check in at the Speaker Ready Room at least one session prior to their assigned session.

All posters up Monday–Wednesday in Exhibit Hall
Poster Session featured Monday, 1:30-3:30 pm – No other sessions at that time

PEP Refund Policy – See page 38

Registration Policy: Unless payment accompanies your form, you will NOT be considered preregistered.

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**Important Events**

<table>
<thead>
<tr>
<th>Welcome Reception</th>
<th>Sessions and Course Locations</th>
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</thead>
<tbody>
<tr>
<td>Please plan on stopping in at the ballroom of the DoubleTree Hotel Sunday, July 8 from 6:00-7:00 pm. The reception will have hors d'oeuvres, passed and in stations, and a cash bar. There will be an opportunity to meet friends to start your evening in Portland.</td>
<td>Saturday and Sunday courses will be held at the DoubleTree Hotel. Monday through Thursday, sessions and courses will be held at the Oregon Convention Center.</td>
</tr>
</tbody>
</table>

**Exhibits**

**Free Lunch! Free Lunch!** – Noon, Monday, July 9. All registered attendees are invited to attend a complimentary lunch in the exhibit hall.

**Breaks Monday Afternoon-Wednesday Morning** – Featuring morning continental breakfasts and afternoon refreshments such as fruit, ice cream and cookies. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!

<table>
<thead>
<tr>
<th>AAHP Awards Luncheon</th>
<th>HPS Awards Banquet</th>
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<tbody>
<tr>
<td>Tuesday July 10 11:00 am-1:00 pm</td>
<td>An enjoyable evening spent with co-members of the National Health Physics Society. This event will be held in the Oregon Convention Center and is an excellent opportunity to show your support for the award recipients as well as the Society. The awards will be presented after the dinner and the event will last from 7:00-10:00 pm.</td>
</tr>
</tbody>
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**Sign up early for tours!**

If tours are not full by the deadline of June 8, there is a chance that they will be cancelled.

Don’t get to the meeting and find that the tour you kept meaning to sign up for is now cancelled due to undersubscription.

Meeting Refund Policy: Request for refunds will be honored if received in writing by June 8. All refunds will be issued AFTER the meeting and will be subject to a $50.00 processing fee. NO REFUNDS WILL BE ISSUED AT THE MEETING. Refunds will not be issued to no-shows.
52nd Annual Meeting, Portland, Oregon
July 8-12, 2007

WELCOME
The Cascade Chapter of the Health Physics Society is pleased to invite you to attend the 2007 National Health Physics Society Meeting. The meeting will be held from July 8-12, at the Oregon Convention Center in Portland, Oregon.

PORTLAND
Maybe you’ve heard that the city of Portland, Oregon has been proclaimed as North America’s “Best Big City,” according to Money magazine. One visit will explain why. Come get a first-hand look at our unmatched natural beauty, our bustling local scene, our sumptuous dining and welcoming accommodations — all effortlessly accessed thanks to our justly-famous light-rail system. Though it’s not easy being green, it’s exactly why so many visitors flock here, year-round.

With moderate temperatures and varied and beautiful terrain, Portland is the quintessential outdoor city. The magnificent waterways overlook the Mount Hood glacier, a backdrop that sets the scene for a spectacular visit at any time of year. Forest Park offers 40 miles of wilderness trails, streams and woods within the city limits. Hiking, biking and exploring opportunities are always close at hand. Smith and Bybee Lakes display stunning wildlife and have great flatwater paddling in America’s largest protected wetland within a city. Just a short drive away, is magnificent Multnomah Falls, the nation’s second-highest year-round waterfall. For a mellow outdoor experience, visit one of the city’s stunning gardens: the Leach Botanical, Classical Chinese, Japanese, or Crystal Springs Rhododendron Gardens.

Please visit the Portland Oregon Visitor’s Association for more information at http://www.travelportland.com/

WEATHER
The average maximum temperature for Portland, OR in July is 79 degrees, and the average minimum temperature is about 59 degrees. Although Portland averages about 42 inches of rain annually, July is notoriously one of the driest months of the year, with an average rainfall of 0.6 inches. However, don’t hesitate to bring a light rain jacket, just in case!

HEADQUARTERS HOTEL - DOUBLETREE PORTLAND
The DoubleTree Portland Lloyd Center is the headquarters hotel for the 52nd Annual Health Physics Meeting. For reservations go to www.hps.org under the Portland meeting to make an online reservation, or call 1-800-996-0510. The rate is $130 per night for standard rooms and $140 for upgraded ones. The DoubleTree Hotel is located a short walk or free light rail ride (2 stops) from the Convention Center.

One overflow hotel is the Holiday Inn Convention Center. Rates are $125 single/double. For reservations go to www.hps.org under the Portland meeting or call 503-233-2401. The Holiday Inn is about a two block walk to the Convention Center.

An additional overflow hotel is the Red Lion Hotel Portland - Convention Center, 1021 NE Grand Avenue. Rates are $119 single/double. For reservations, call 1-800-343-1822 or 503-235-2100 and ask for Health Physics Society or HPS rate; hotel is across the street from the Convention Center.

Another overflow hotel is Marriott Courtyard Portland Lloyd Center/Downtown, 435 NE Wasco Street; rate is $134 single/double; call 503-234-3200 and ask for the Health Physics Society rate; or to make reservations online go to http://cwp.marriott.com/pdxcl/healthyphysicssociety/; hotel is 1 1/2 blocks from the Convention Center.

AVIS CAR RENTAL
Special discounts are available on a wide selection of vehicles and are good from one week before to one week after the meeting. So take in the sights and explore the surroundings.

To reserve a car, contact Avis at 1-800-331-1600 and use your Avis Worldwide Discount (AWD) number J953510. Or reserve online and have your discount number automatically included in your reservation and receive an email confirmation. Go to the HPS website, www.hps.org under the Portland meeting section to reserve your car online.
TRANSPORTATION - GETTING AROUND PORTLAND *(it’s easy!)*

**To and from Portland International Airport**

TriMet’s MAX Light Rail system connects Portland, Gresham, Beaverton, Hillsboro and the Portland Airport. Trains run every 5-15 minutes roughly between 4:30 a.m. and midnight. Simply ride the MAX ("red line") light rail from the airport terminal (west end, ground floor) directly to the DoubleTree Hotel (11th Street stop), or to the Convention Center (two stops further west). The cost each way is currently $2.00.

The pickup area for taxis, town cars, long-haul shuttles, hotel vans and parking lot shuttle buses is located in the center section of the airport terminal’s lower roadway on the baggage claim and departure level. Airporter shuttles, off-airport rental car shuttles and reserved vehicles are found in the section of the lower roadway closest to the garage. Most transportation providers serve downtown Portland, which is approximately 20-40 minutes from Portland International Airport. The cost each way for a town car or taxi is about $30.00.

**Driving from the airport**
- from I-84 west, stay in right lane -just before the I-5 N exit take the Lloyd Center exit:
- drive one block,
- turn right at 11th Street NE, which will put you very close to the DoubleTree Hotel next to Halladay park.

**Arriving by Car**

From Seattle via I-5 from the north,
- take the “Rose Quarter”, Convention Center exit,
- go south on NE Wheeler, and past the big arena building,
- turn east on Multnomah Blvd. under the freeway towards the Lloyd Center Shopping Mall,
- turn south on 11th Street NE to the DoubleTree Hotel main entrance.

From Salem via I-5 from the south, stay on the east side of the river,
- go past the I-84 E exit, take the Rose Quarter, Convention Center exit
- go right on NE Weidler to the Lloyd Center Mall
- the DoubleTree Hotel is on the south side of the Mall, adjacent to Halladay Park.

**Arriving by AMTRAK**

A taxi ride from the train station to the hotel is approximately a mile across the river to the hotels and convention center. If you have very little luggage, you could try walking four blocks south to the MAX light rail, and take it to the convention center or DoubleTree Hotel.

A short bus ride to the downtown Portland transit mall, and an eastbound MAX ride to the convention center is also an option. (all fareless)

**HOSPITALITY SUITE**

Registered spouses and companions will again enjoy the benefit of a Hospitality Suite in the Oregon Ballroom at the DoubleTree Hotel. The Suite, located on the 1st level will open at 10:00 am on Sunday, July 8. Local HPS members will be on hand to help with planning day trips or selecting restaurants; newspapers, books, and games will also be available. A continental breakfast will be available Monday through Wednesday mornings for registered companions.

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<table>
<thead>
<tr>
<th>Hospitality Suite – For Registered Companions</th>
<th>Oregon Room, DoubleTree Hotel</th>
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<tbody>
<tr>
<td>Monday Welcome . . . . . . . . 8 - 9 am</td>
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<tr>
<td><strong>Days/Hours</strong></td>
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<tr>
<td>Sunday . . . . . . . . . . . . 10 am - 3 pm</td>
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<tr>
<td>Monday . . . . . . . . . . . . 8 am - 3 pm</td>
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<td>Tuesday . . . . . . . . . . . . 8 am - 3 pm</td>
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</tr>
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<td>Wednesday . . . . . . . . . . . . 8 am - 3 pm</td>
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</tbody>
</table>
Tours...Events...Tours...Events...Tours...Events...Tours...Events...Tours

SOCIAL TOURS

Most of the social tours will be provided by EcoTours of Oregon. They are a small local company that emphasizes nature, the environment and Native American history, as well as the more recent history of Oregon and the Pacific Northwest. Keep an eye on the meeting website for any changes in itineraries.

Sunday, July 8th

Eola Hills Winery Tour and Brunch

10:00 AM - 5:00 PM  
Pre Reg: $45/On Site: $55

The winery is situated in a natural weather shadow of the Coast Range which shunts storms from the Pacific Ocean so the Eola Hills vineyards are protected from weather extremes. In the summer, a gorge carved by ancient glaciers draws in maritime air to provide ideal cooling. The founder, Tom Higgins, knew that great wines could only come from such precious vineyard land.

Sunday Brunch at Eola Hills, like its award winning wine, has been widely acclaimed. Dine surrounded in the ambiance of a working winery. Each week features different “Specials,” plus Pan Fried Oysters, ten styles of Eggs Benedict, an Omelet & Pasta Bar, Belgian Waffle & Crepe Bar, Soup & Salads and Tacos Al Pastor. Brunch price includes two glasses of Eola Hills wine.

A 47 passenger luxury bus will leave the DoubleTree Hotel at 10:00 am, arriving at Eola Hills Winery at 11:00. Brunch and wine tasting until 1:30. A stop at a second winery at 2:00 pm, tour and tasting until approximately 3:30, arriving back at the DoubleTree Hotel by 4:30-5:00 pm.

Portland City Tour

1:00 - 4:30 PM  
Pre Reg: $40/On Site: $45

If you have never been to Portland before, this tour will provide you with the information you need to enjoy your stay. This tour includes a scenic drive through the city where you will be shown some of the off-the-beaten-path restaurants, shops and nightlife that make Portland unique. Along the way you will learn the history of the city and hear interesting facts about life in the “City of Roses.” The tour includes a stop at the elegant Pittock Mansion, where you can walk the grounds overlooking the city of Portland and enter if you wish to see the lovely decor within this 16,000 square foot French Renaissance Mansion ($6.00 admission not included). You can also roam the beautiful International Rose Test Gardens to view the 525 varieties of roses in the oldest public rose garden in the United States. Both sites offer fantastic views of the city.

Monday, July 9th

Portland City Tour

9:00 AM - 12:30 PM  
Pre Reg: $40/On Site: $45

See the tour description above.

Mount Saint Helens

9:00 AM - 5:00 PM  
Pre Reg: $59/On Site: $64

+ Lunch expense

It has been 27 years since the eruption of Mount Saint Helens. The surrounding area was devastated by the eruption, but it is slowly growing back. The immense effect the eruption had on the surrounding region must be seen to be appreciated. On this tour you will learn about the “blast zone,” mudflows, pyroclastic flows, biological regeneration, and the largest avalanche recorded by man. On the way to the mountain, you will drive through the “blast zone” where you will see hillsides still covered with shattered trees and stumps. You will be able to explore three different visitor’s centers; each will offer a different view of the mountain and perspective on the eruption. Lunch is not provided, but you can bring your own or eat at one of the visitor’s centers.
2nd Annual Radioactive Open Mic Night!

8:00 - 11:00 PM
The Cascade Ballroom at the DoubleTree Hotel

In appreciation of the many musicians in the Health Physics Society, Thomas Gray and Associates, (TGA, Inc.) and XRF Corporation will host the Second Annual Radioactive Open Mic Night on Monday evening. Come enjoy classic rock n roll music provided by local Oregon band Parish Gap featuring Mike Zittle on drums.

Attendees are invited to participate in the fun by joining the band onstage to play an instrument or sing a song. A songlist will soon be published on the web for participants to preview and select a song to sing or jam on.

Have fun entertaining your friends and colleagues from the health physics community by participating in this lively event! If you can’t sing or play an instrument just come to listen and dance the night away!

Admission is FREE to all attendees. There will be a cash bar serving beer and wine.

Tuesday, July 10th

Annual HPS 5K Run/Walk

6.30 - 8.30 AM
Pre Reg: $25/On Site: $30
The annual 5K Fun Run will be held on a beautiful riverfront course as the sun rises across the Willamette River. The start and finish are within walking distance of the convention center (there will be transportation to the starting line) and the course will take runners on a scenic tour over two bridges and around the Portland waterfront area. Categories will include male/female under 40, and male/female 40 and over. An overall male/female award will be given as well. Includes T-shirt, transportation, refreshments, race timing, and awards.

Northern Oregon Coast

9:00 AM - 5:30 PM
Pre Reg: $58/On Site: $63

+ Lunch expense
This journey will take you along Oregon’s breathtaking coastline where you will stop for viewing wildlife, pristine beaches and rocky cliff heads. Along the way you will learn about natural, Native American and regional history. You will visit the artists’ community of Cannon Beach where you can eat lunch at one of the many restaurants and view the famous “Haystack Rock.” You will also stop at the famous Tillamook Cheese Factory where you can sample their delicious American-style cheeses and creamy ice cream. You will also see picturesque farmland, Oregon’s premier vineyard region, and of course the beautiful forests of the Coastal Mountain Range.

Golf Eastmoreland

3:00 - 9:00 PM
TBA (Greens fees $38.00 walk and $52.00 ride)

Eastmoreland is in a beautiful setting and will challenge golfers of all abilities. Built in 1918, the course is traditionally landscaped and is the third oldest course in Oregon. Eastmoreland was host golf course of the 1990 US National Public Links. The course is surrounded by Crystal Springs Lake, the Rhododendron Gardens, Johnson Creek and has an endless variety of trees and shrubs in constant color change throughout the year. Total length is 6400 yards. For more information: http://www.eastmorelandgolf-course.com/ Space is limited so sign up early!
**Wednesday, July 11th**

**Oregon Wineries**
Pre Reg: $80 + Lunch expense/On Site: $85 + Lunch expense

Savor award-winning Pinot Noir, Pinot Gris, Chardonnay and Riesling while your designated driver guides you through the rolling hills of the picturesque Williamette Valley. You will visit four or five wineries, and a step-by-step tour of the wine-making process is included. All of the wine tasting fees are included, but you will be responsible for your own lunch. You can either bring one with you or purchase something when the tour stops for lunch.

**HPS Night Out: Dinner Cruise on the Sternwheeler Rose**
Pre Reg: $55/On Site: $60

The Sternwheeler Rose is a unique and entertaining way to enjoy Portland's enchanting skyline and river. Built in Bandon, Oregon in 1987, at 80' long and 98 gross tons, it is a replica of an 1870's paddlewheel boat. Unlike many other paddlewheel boat replicas, the Sternwheeler Rose's paddlewheel is the sole means of propulsion, adding to the charm of this tour and dining experience. The two hour dinner cruise on the Willamette River will give you a taste of the scenery and wildlife that is abundant in the Pacific Northwest. Mount Hood, nesting pairs of Bald Eagles, Osprey that fish in the river, and playful River Otters are just some of the sights that may be encountered on this cruise.

The dinner is served buffet style, and will consist of carved prime rib (served with au jus and horseradish), orange ginger cured salmon, herbed & wild rice pilaf, orange glazed carrots, a delicious mesclun mix of greens, gourmet dinner rolls, and fresh fruit tartlettes.

Bus boarding at DoubleTree 6:30-6:45, boat boarding at 7:00, cruise from 7:30-9:30.

**Portland Microbrews – Brew Bus**
Pre Reg: $40/On Site: $45

Did you know that Oregon is the microbrew capital of the United States? In fact, Portland has more breweries than any other city in the world. Come aboard the Brew Bus, the college of brew knowledge, for an educational and entertaining evening. Not only will you learn about the beer making process and the history of Portland and beer, you will also get a tour of the city and a sampling of some of Portland's best microbrews. Ales, lagers, porters, stouts, IPA's, hefeweizen and other styles will all be covered on this tour. The price of the tour includes beer samples, appetizers, and a sampling score card to keep track of which beers were the most outstanding. You will be touring at least one-brewery, so sandals and open-toed shoes are not allowed. Goggles will be provided if needed.

**Thursday, July 12th**

**Columbia Gorge and Multnomah Falls**
Pre Reg: $40/On Site: $45

Enjoy an afternoon driving through one of the premier wind-surfing spots in the country. There will be stops to view the breathtaking Columbia River Gorge and several waterfalls with interesting names like Latourell, Wahkeena, and Multnomah. Plummeting 620 feet from its origins on Larch Mountain, Multnomah Falls is the second highest year-round waterfall in the United States. There will be time for short walks, photo opportunities or quiet reflection (you choose).
ACTIVITIES & EVENTS IN THE AREA

Portland Historic Races: July 6–8, 2007
The event, which features high-speed racing by 250 prestigious vintage cars, runs daily from 8:30 a.m. to 6 p.m. It is a fundraiser for the Children's Cancer Association, a not-for-profit organization based in Portland that works to positively impact the care and quality of life for seriously ill children and teens with cancer and other life-threatening illnesses throughout Oregon and the United States. http://www.portlandhistorics.com

Waterfront Blues Festival: July 4–8, 2007
Ride the Max to celebrate 20 years of the Blues and Fighting Hunger at the 2007 Safeway Waterfront Blues Festival at Tom McCall Waterfront Park on the banks of the beautiful Willamette River in downtown Portland. You won't want to miss this best Waterfront Blues Festival ever for which festival organizers are planning five fabulous days on four stages daily with a total of more than 150 performances kicked off by a spectacular fireworks display on the Fourth of July at 10:00 p.m. http://www.waterfrontbluesfest.com

Minor League (AAA) Baseball: July 7-8, 2007
Take MAX westward to PGE Park to see the Portland Beavers (San Diego Padres affiliate) play the Tacoma Rainiers (Seattle Mariners affiliate). Game times are Saturday night, at 7 pm, and Sunday afternoon at 2 pm. http://www.portlandbeavers.com

THINGS TO DO ON YOUR OWN

Take advantage of our long summer days to enjoy the Portland Metro area. Depending on the amount of time available, you can enjoy the city itself, or head to the mountains, go for the rugged coast scenery, tour wineries, look into a volcano, or hike in the Columbia Gorge and see waterfalls. If you don't have a car, there are many activities within easy reach via MAX light rail or taxi. The table below will help you decide. With so many choices, you will feel like it's being a kid in a candy store. For more information, be sure to visit the Hospitality Suite in the Oregon Ballroom of the DoubleTree Hotel.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>LOCATION</th>
<th>HOW TO GET THERE</th>
<th>APPROXIMATE DISTANCE FROM CONVENTION CENTER</th>
<th>TRAVEL TIME FROM CONV. CTR. (one way)</th>
<th>SUGGESTED TIME TO SPEND</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown Portland Area</td>
<td>West side of river from Convention Center</td>
<td>MAX Fareless Square free</td>
<td>1 mile +</td>
<td>10 min</td>
<td>1 hour to 4 hours</td>
<td>Shopping, Restaurants &amp; Museums</td>
</tr>
<tr>
<td>Oregon Zoo</td>
<td>West of downtown</td>
<td>MAX Light Rail: Pay 1 Zone</td>
<td>4 miles</td>
<td>20 min</td>
<td>2 to 3 hours in afternoon or evening</td>
<td>Zoo train for kids</td>
</tr>
<tr>
<td>Oregon Museum of Science and Industry (OMSI)</td>
<td>South east of downtown</td>
<td>Bus or taxi</td>
<td>3 miles</td>
<td>30 min</td>
<td>2 to 3 hrs</td>
<td>Kids Area and OMNIMAX</td>
</tr>
<tr>
<td>Japanese Gardens</td>
<td>West side of PDX</td>
<td>Car, Taxi</td>
<td>3 miles</td>
<td>25 min</td>
<td>1 to 2 hrs</td>
<td>Traditional Gardens</td>
</tr>
<tr>
<td>Children's Museum</td>
<td>Next to Zoo</td>
<td>MAX</td>
<td>3 miles</td>
<td>20 min</td>
<td>1 to 2 hrs</td>
<td>next to Forestry Center</td>
</tr>
<tr>
<td>Classic Chinese Garden</td>
<td>Down town</td>
<td>MAX</td>
<td>1 mi +</td>
<td>10 min</td>
<td>1 to 1.5 hr</td>
<td>1 block from MAX</td>
</tr>
<tr>
<td>Oregon Historical Society Museum</td>
<td>Downtown, Park Blocks near Portland State Univ</td>
<td>MAX, plus short walk</td>
<td>3 mi</td>
<td>20 min</td>
<td>2 hrs</td>
<td>Art and artifacts</td>
</tr>
<tr>
<td>New $50M sky tram</td>
<td>Oregon Hth. &amp; Sci Univ</td>
<td>MAX &amp; Street car</td>
<td>3 mi.</td>
<td>30 min</td>
<td>1 to 1.5 hr</td>
<td>$4 to ride gondola</td>
</tr>
</tbody>
</table>

13
Tours...Events...Tours...Events...Tours...Events...Tours

Away from Portland

**McMenamin's Edgefield**

Historic Edgefield is one of the truly remarkable destination resorts of the Pacific Northwest. It is a world of relaxation that seamlessly blends Oregon’s natural beauty with McMenamins’ signature whimsy: historic buildings of all sizes artfully restored and rich with cozy interiors, tranquil ponds and dazzling gardens, great food and drink, plentiful entertainment and surprising recreations. Encompassing a lush 38-acre parcel of farmland at the mouth of the spectacular Columbia River Gorge, Edgefield is a 15-minute car ride to or from the center of downtown Portland.

The stately main Edgefield building (circa 1911), with over 100 European-style guestrooms and hostel accommodations, is a national historic landmark. Each spacious room is furnished in charming turn-of-the-century decor. There are no televisions or telephones in the rooms, encouraging tranquility as surely as do the rocking chairs on our verandas. In the morning, join us in the Black Rabbit Restaurant for breakfast.

On the grounds, you will find a plethora of diversions. Enjoy our fine-dining restaurant, classic pub, numerous small bars and colorful summertime grill. For liquid refreshment you will enjoy handcrafted ales, wines, spirits and aromatic house-roasted coffees created by McMenamins. Sports lovers will appreciate the golf course and onsite massage. Everyone will love the extensive gardens, onsite glass-blower and pottery maker, extensive artwork everywhere, recent-run movie theater, live music concerts and the Edgefield Gift Shop abundant with treasures from the Pacific Northwest and the world over.


**Powell’s Books**

The largest independent used and new bookstore in the world, carrying an extensive collection of out of print, rare, and technical titles. Powell’s City of Books (Burnside) 1005 W Burnside, Portland, OR 97209 USA

**Portland Art Museum**

Rembrandt and the GoldenAge: Masterpieces from the Rijksmuseum

In conjunction with the Rijksmuseum, Amsterdam, the Portland Art Museum announces the American tour and exclusive West Coast viewing of the exhibition. A legion of great painters will be represented and complemented by a selection of ceramic, glass, and silver show pieces to be the most beautifully produced by 17th century Dutch silversmiths.

**EVENT DAY(S): HOURS:**

- Tues., Wed., and Sat. - 10 a.m. to 5 p.m.; Thurs. and Fri. - 10 a.m. to 8 p.m.; Sun. - Noon to 5 p.m.

**LOCATION:** 1219 SW Park Avenue; Telephone: 503.228.2811

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**ACTIVITY**

- Tillamook, OR
- Astoria, Oregon
- Fort Clatsup
- Multnomah Falls
- Dundee, Or
- Me Minville, Or
- Timberline Lodge @ Mt. Hood
- Mt. St Helens
- Oregon Garden

**LOCATION**

- West US 26 hwy , Oregon hwy 6
- West on US hwy 30
- US hwy 101 west of Astoria
- East on I-84
- State hwy 18 south west
- US hwy 99 south west
- East on US 26
- I-5 N, then exit 49 Toule
- 1 - 5 S, then exit 263

**HOW TO GET THERE**

- car
- car or tour bus
- car or tour bus
- car or tour bus
- car

**DISTANCE FROM CONVENTION CENTER**

- 75 mi approx
- 90 mi approx.
- 95 mi approx.
- 50 mi approx.
- 30 mi approx.
- 40 mi. approx.
- Car or tour bus
- 105 mi approx.
- 40 approx.

**TRAVEL TIME FROM CONV. CTR. (one way)**

- 1.5 hr
- 2.5 hrs
- 3/4 hr
- 1 hr
- 1 hr
- 40 mi. approx.
- 65 miles approx.
- 2.5 hrs
- 1 hr

**TOTAL TIME NEEDED**

- 6 to 8 hrs
- 8 to 10 hrs
- 3 to 6 hrs
- 3 to 4 hrs
- 3 hrs
- 4 to 6 hrs
- 6 to 7 hrs
- 3 to 4 hrs

**COMMENTS**

- Dairy, and WW II air museum
- Maritime museum.
- Lewis & Clark info.
- nice hiking trails
- tour several wineries
- Air Museum Spruce Goose, Linfield College, Casino
- Views and summer skiing
- volcano visitor center
- Beautiful plant life

*Travel times may vary due to traffic congestion as there will be a significant amount of construction in the downtown area in July*
The Oregon Zoo

Home to animals from all corners of the world, including Asian elephants, Peruvian penguins and Arctic polar bears. From the mist-filled Africa Rain Forest to the majestic Great Northwest exhibits, the zoo encourages visitors to understand and experience the natural world. Committed to conservation of endangered species and their habitats—both locally and around the globe—the zoo is a center for wildlife preservation and field research. The Oregon Zoo's award-winning education programs serve more than a half-million people both at the zoo and at schools, senior and community centers around the region. A summer concert series, seasonal events and the zoo railway help this popular Oregon attraction draw more than one million visitors each year. An authentic steam engine leads one of three trains that take visitors through the zoo and the wooded hills of Washington Park. The 5/6 size replica follows a four-mile course to a depot near Portland's International Rose Test and Japanese Gardens.

Chamber Music Northwest

Box Office & Tickets: 503-294-6400. The program is tentatively "Music from Great Britain" Purcell-Britten-Elgar

The Pittock Mansion

Take a Step Back in Time - Home to Portland pioneers Henry and Georgiana Pittock from 1914 to 1919. During the late 1800s and the early 1900s, their lives and work paralleled the growth of Portland from a small Northwest town site to a thriving city with a quarter million population. With its eclectic architectural design and richly decorated interior, including family artifacts, the Pittock Mansion stands today as a living memorial of this family’s contributions to the blossoming of Portland and its people.

Portland Saturday Market (open Sundays, too)

A free MAX ride, first downtown stop Located at SW First Ave & Naito Parkway. Saturdays 10 - 5pm Sundays 11 - 4:30pm

Drift down the aisles of our craft market... meet our ARTISTS... stop for LUNCH in our international food court...enjoy local music & performance groups on the Portland Saturday Market MAIN STAGE... create arts and crafts at our KIDS ACTIVITY booth

Shopping and Restaurants

The Lloyd Center Mall is across the street from the DoubleTree Hotel, and MAX will take you across the Willamette River to downtown Portland. Transfer to the Portland Streetcar to continue west and north to the small shops and restaurants on NW 21st and 23rd. Or – take the streetcar south to Riverplace, at the south end of Waterfront Park, to stroll along the Willamette River next to a marina, with shops and restaurants.

Downtown Attractions

Take MAX across the Willamette. At the first stop is the Saturday Market, and a few blocks away is the Portland Classical Chinese Garden. Stay on MAX to reach Pioneer Courthouse Square, which is surrounded by shopping and the Pioneer Square (not your typical) mall. Continue on MAX to transfer to the Portland Streetcar southbound to get to the Central Library, Portland Art Museum, Oregon Historical Society, and Portland Performing Arts Center. Continue to the end of the line and take the new Portland Aerial Tram for spectacular views of downtown, Mt St Helens and east to Mt. Hood. The upper terminal is in the new Kohler Pavilion of the Oregon Health & Science University.

Northwest River Cruise

Come a week early, or stay a week after the meeting and see the scenery Lewis and Clark saw and wrote about over 200 years ago. Majestic America Line offers 7-day cruises on the Columbia and Snake Rivers. For more information and cruise itineraries see Majestic America Line's website: www.majesticamericaline.com

Portland Aerial Tram

The Tram cabins travel 3,300 linear feet between the South Waterfront terminal adjacent to the OHSU Center for Health & Healing, and the upper terminal at the Kohler Pavilion on OHSU's main campus. Traveling at 22 miles per hour, the Tram cabins rise 500 feet for the three-minute trip over I-5, the Lair Hill neighborhood and the Southwest Terwilliger Parkway.

Hours of Operation: M-F 6 AM - 10 PM, Sat 9 AM - 5 PM, Sun 1-5 PM.

The Tram cabins depart every five minutes. The last Tram leaves the lower terminal 15-minutes before closing. tickets are $4, purchased at lower terminal - machine accepts only debit/credit cards and quarters.
Tuesday, July 10

The Reed College Reactor Facility has been used for research and educational projects at public and private high schools, colleges, and universities in northwest Oregon since 1968. Although the main purpose of the reactor is to support Reed College student thesis projects and for faculty research, the largest number of users are from local colleges, universities, and high schools. The Reed College Reactor is an aTRIGA Mark I “swimming pool” reactor licensed for 250 kW. The reactor is primarily used in chemistry and physics courses for instruction, research, and analysis, especially trace-element analysis. In addition to providing student research opportunities, the reactor works to educate the community on the principles of radiation, health physics, nuclear reactors. The reactor has over 1000 visitors every year from area colleges, universities, and high schools.

The reactor is operated almost entirely by undergraduate students who are licensed by the Nuclear Regulatory Commission. This allows students to conduct their own research projects and to be hired by the facility to conduct irradiations for educational organizations, private research organizations, and for industrial applications. Approximately 50 students hold an active reactor operator license, which is 4% of the Reed College student body.

Shuttles will be provided from the Convention Center to Reed College and back. Cost of the shuttle is included in the registration. More information can be found at http://reactor.reed.edu/. Limited to the first 70 people who register.

Wednesday, July 11

Oregon Health & Sciences University (OHSU) – MRI Imaging Research Center with 3, 7 and 12 Tesla magnets

Staggered 45-minute tours every 15 minutes. Total time, including transportation on MAX, streetcar and tram is about two hours.

Advanced sign-up needed in order to schedule time at the Center, although a few spots may be available on-site, depending on initial sign-up.

The director of Oregon Health & Science University’s new Advanced Imaging Research Center (AIRC), Charles Springer, PhD, and his staff will introduce us to the high-tech world of MRI medical research. The scientists expect their work will provide clearer diagnoses of many cancers, including those of the breast and prostate. AIRC took delivery of a 12 Tesla (T) magnet last year, the centerpiece of a rare and cutting-edge MRI system, which includes a 3T magnet, and a 60 ton, 7T magnet. The 7T MRI magnet came to the United States from the United Kingdom plant where it was constructed. There are only a handful of 7T MRI systems for human subjects in the world at this time, with six currently operating in the United States. Only three other U.S. institutions house human-capable MRI instruments featuring magnets with fields greater than 7 Tesla.

The 12T instrument has a magnetic field 120,000 times stronger than that of the Earth. While the 12 T magnet has a greater field strength than that of the 7 T magnet, this magnet weighs less (only 12 tons, 24,000 pounds) and is smaller. It is designed for human health studies in animals. Only one other 12 T magnet this large exists in the world. It is housed at the National Institutes of Health in Bethesda, Md.
Transportation: Travel in the new Portland Aerial Tram! While part of Portland’s public transportation system, and owned by the city, OHSU (Oregon Health & Science University) provided $40 million of the $57 million construction costs. ($8.5 million will be collected over time from the rising property values in South Waterfront caused by its redevelopment. OHSU oversees operation of the Tram, while the City of Portland is responsible for the maintenance of the upper and lower stations and tower.

The Tram cabins travel 3,300 linear feet between the South Waterfront terminal adjacent to the OHSU Center for Health & Healing, and the upper terminal at the Kohler Pavilion on OHSU’s main campus. Traveling at 22 miles per hour, the Tram cabins rise 500 feet for the three-minute trip over I-5, the Lair Hill neighborhood and the Southwest Terwilliger Parkway.

The Tram operate M-F 6 am-10pm, Sat 9am-5pm. Tram cabins depart every five minutes. The last Tram leaves the lower terminal 15-minutes before closing. The lower terminal of the Tram can be reached from downtown by riding the Portland Streetcar southbound to the SW Moody & Gibbs stop.

For a résumé form, contact:
David Drupa, HPS Headquarters
1313 Dolley Madison Blvd., Suite 402, McLean VA, 22101
Email: DDrupa@BurkInc.com

These forms must be sent no later than June 22, 2007. Once these forms are received, a résumé number will be issued and inserted on side one and two. By June 29, 2007, a résumé number will be assigned to all résumé forms and a photocopy of side two (with the résumé number) will be sent back to you. Please remember what résumé number has been assigned to you. A photocopy of side one will be posted at the meeting. The original résumé form will be kept in a book, strictly confidential, for six months after the meeting and then destroyed.

All completed résumé forms (side one) will be posted at the same time and will be up for the duration of the meeting. If an interested company wants more information, such as a more extensive résumé or an on-site interview, they will write a note on the message board in the placement center room. An example would be: “Résumé Numbers 12, 17 and 56 please leave your résumé at the Hotel front desk to the attention of D. A. Smith, XYZ Company,” or “Company QRS would like to interview Résumé Numbers 19 and 23, please call J.D. Jones to set up appointment during meeting.”
52nd Annual Meeting of the Health Physics Society
Portland, Oregon, July 8-12 - Preliminary Scientific Program
Presenter’s name is asterisked (*) if other than first author.

MONDAY

7:00-8:00 AM A105
CEL1 Workforce Pipelines for the Nuclear Renaissance
Ken Ferguson
Ken Ferguson, LLC

7:00-8:00 AM A106
CEL2 Medical Reserve Corps (MRC) – Volunteer Opportunity for Health Physicists to Contribute to Their Local Communities
Armin Ansari
Centers for Disease Control and Prevention, Atlanta

8:15 AM-Noon Oregon Ballroom 201/202

MAM-A: Plenary Session

Chair: Brian Dodd

8:15 AM
Welcome to Portland
Brian Dodd, President, HPS, and Local Arrangements Committee

8:30 AM MAM-A.1
Update and Insights on the Po-210 Incident
Bailey, M.R. (G. William Morgan Lecturer)
Health Protection Agency, UK

9:10 AM MAM-A.2
The International Radiological Work of the U.S. Department of State
Senior Scientist
Bureau of International Security and Nonproliferation, U.S. Department of State

9:50 AM BREAK

10:20 AM MAM-A.3
The International Radiation Protection Association and IRPA12
Vice-President
International Radiation Protection Association

10:30 AM MAM-A.4
Radiation Safety Infrastructure in Developing Countries: A Proactive Approach for Integrated and Continuous Improvement
Mrabit, K. (G. William Morgan Lecturer)
International Atomic Energy Agency, Vienna

11:10 AM MAM-A.5
The CRITr Program: Training International Law Enforcement Personnel in Radiation Detection
Bernhardt, T., Frame, P.*, Musolino, S. (Landauer Lecturer)
Oak Ridge Associated Universities, Brookhaven National Laboratory

1:30-3:30 PM Exhibit Hall

Poster Session

ACCELERATOR
P.1 Instrumentation for Laser Compton Scattering X-Ray Beam Diagnostics
Estes, B., Wells, D., Chouffani, D.
Idaho Accelerator Center (IAC)

P.2 Re-evaluation of 7Be Attachment Mechanisms in Ionized Air
May, R., Welch, K., Murla, J.
Jefferson Lab

P.3 Terahertz Radiation Exposure Guidance at Jefferson Lab
May, R., Ferguson, C.
Jefferson Lab

P.4 Compact Shadow Shielding for a Portable 14.1 MeV Isotropic Neutron Generator
Whelstone, Z.D., Lehnert, A.L., Zak, T., Kearfott, K.J.
University of Michigan

P.5 Methodology for Assessing Radiation Detectors Used by Emergency Responders
Wasiolek, P., Simpson, A.
Remote Sensing Laboratory, National Security Technologies, Inc.

P.6 Active, Non-intrusive Inspection Technologies for Homeland Defense
Ankrah, M., Oczan, I., Spaulding, R., Smith, M., Farfan, E.
Idaho State University, Idaho Accelerator Center

DECOMMISSIONING
P.7 Decommissioning Survey of Old Poultry Farm
Razmianfar, N.
West Virginia University

P.8 Decontamination and Decommissioning Training at Fluor Hanford
Wollam, C.
Fluor Hanford

EMERGENCY PLANNING RESPONSE
P.9 Lessons Learned by the U.S. Army Radiological Advisory Medical Team at Vigilant Shield 2007
Sublett, S.M., Scott, A.L., Melanson, M.A.
US Army

P.10 Wireless Networked Environmental Continuous Air Monitoring in Support of NASAs New Horizons Mission to Pluto
Rodgers, J., Hoy, M., Rodgers, D.
Canberra Albuquerque, Valdosta State University

ENVIRONMENTAL
P.11 Development of Trigger Levels for Application to Core Scan Data at the Linde Formerly Utilized Sites Remedial Action Program (FUSRAP)
Battaglia, T.
Shaw Environmental, Inc.

Noon-1:30 PM Exhibit Hall A

Complimentary Lunch in Exhibit Hall for all Registrants and Opening of Exhibits
MONDAY

P.12 Radiation Safety Standards in Practice: Independent Radiological Monitoring Program in Georgia
Avtandilashvili, M., Dunker, R., Pagava, S., Rusetski, V.
Idaho State University, Tbilisi State University

P.13 Development of Release Fractions and Airborne Release Rates for Upstream Components Such as Gloveboxes and Vessels Containing Plutonium.
LeBaron, G., Woolery, W., Mishima, J., Bates, J., Jarvis, M.

P.14 Measurement of Cs-137 Concentration and Estimation of Sedimentation Rate in Lake McDonald
Billa, J., Brey, R., Gesell, T., Thackray, G.
Idaho State University

P.15 Concentrations of Cs-137 in Imported Foodstuffs and Daily Intakes of Radionuclides for People, in Japan

P.16 Characteristics of Localization of Cs in Edible Mushroom (Pleurotus ostreatus).
Takahashi, M.N., Kato, F., Maeda, C., Sugiyama, H.
National Institute of Public Health, Toho University

P.17 Measurement of the Polonium-210 and Lead-210 Contents of Chinese Cigarettes
Schayer, S., Nowak, B., Qu, Q., Wang, Y., Cohen, B.
New York University School of Medicine, Peking University Health Science Center, Beijing, PRC

P.18 Biomonitoring Strategies Employed to Assess Impacts from a Low-Level Radioactive Waste Disposal Site (Area G) at Los Alamos National Laboratory
Fresquez, P. R.
Los Alamos National Laboratory

EXTERNAL DOSIMETRY
P.19 High Dose Electron Beam Response of CAF2 Mixed with DY
Gholampoor, M., Gheisari, D., Mirjallili, G., Moini, A.R., Shekari, L.
Yazd University, Iran, Tarbiat Modares University, Iran

P.20 Effects of Marrow Cellularity on Radiation Dose Calculation Using Realistic Anthropomorphic Models
Caracappa, P., Xu, X.
Rensselaer Polytechnic Institute

P.21 Development of a Computational Phantom with Moving Arms and Legs
Akkurt, H., Eckerman, K., Wiarda, D., Wagner, J., Sherbini, S.
Oak Ridge National Laboratory, US Nuclear Regulatory Commission

P.22 Advanced Radiation Safety and Reduced Personnel Exposure in Interventional Radiology
Bryant, B.
University of Alabama

P.23 ALARA Planning and Teaching Tool Based on Virtual-Reality Technologies
Zhang, D., Xu, X., Bushart, S.
Rensselaer Polytechnic Institute, Electric Power Research Institute

P.24 How Accurate is the Dose Look-up Table in Small Animal Cesium Irradiator?: A Comparison Between Direct TLD Measurement and Dose Look-up Table
Brady, S., Muramoto, G., Ke, C., Tonceva, G., Daigle, L., Nguyen, G., Chute, J., Marslek, P., Dewhirst, M., Yoshizumi, T.
Duke University

P.25 Spectroscopic Neutron Dosimetry
Czirr, J.B., McKnight, T., Klaas, R., Dodd, B.
Photogenics, Health Physics Society

HOMELAND SECURITY
P.26 Estimating Doses To Healthcare Providers After an RDD Event
Dewji, S., Bridges, A., Hertel, N., Burns, K.
Georgia Institute of Technology

P.27 Simulating Cs Radiological Dispersal Devices for Deposition, Dose and Decontamination Studies
Lawrence Livermore National Laboratory

P.28 Dose Calculations for New Imaging Technologies Used in the Detection of Radiological Weapons of Mass Destruction
O’Brien, R., Lowe, D., Patton, P.
University of Nevada, Las Vegas

P.29 Management of Low Level Radioactive Waste from a Threat Reduction Perspective
Wald-Hopkins, M.
Los Alamos National Laboratory

INTERNAL DOSIMETRY AND BIOASSAY
P.30 Internal Dose Assessment Data Management System for a Large Population of Pu Workers
Bertelli, L., Miller, G., Little, T., Guilmette, R., Glasser, S.
Los Alamos National Laboratory, LogiCreativity

P.31 Uptake and Retention of Inhaled H-3/C-14 Methane in Rats
Carlisle, S., Burchart, P., Boulanger, C., Surette, R.
AEC Chalk River Labs

P.32 Does Exposure to Plutonium Affect Workers Longevity?
Fallahian, N., Brey, R.R., Watson, C.R., James, A.C.
Idaho State University, Washington State University

P.33 Evaluation of the Draft NCRP Wound Model using USTUR Case 262 Data
Germann, L.K., Brey, R., James, A.C.
Idaho State University, Washington State University

P.34 Quantifying the Inhomogeneity of Dose in Marrow/Bone Interface-Rich Skeletal Sites
Gersh, J., Jokisch, D., Toburen, L., Dingfelder, M.
East Carolina University, Francis Marion University
MONDAY

P.35 International Comparison on Monte Carlo Modelling for in vivo Measurements of Americium in a Knee Voxel Phantom
Gómez-Ros, J., de Carlan, L., Gualdrini, G., Lis, M., Lopez, M., Moraleda, M., Zankl, M., Franck, D.*
CIEMAT, Spain, IRSN, France, ENEA ION-IRP, Italy, GSF, Germany

P.36 Calculations of Lethal Dose of Polonium-210
Koop, J.
Texas A&M University

P.37 Comparison of Radioiodine Biokinetics and Radiation Doses Following the Administration of Tracer and Therapeutic Activity to Patients in Thyroid Cancer Management
Willegaignon, J., Guimarães, M., Stabin, M.*, Sapienza, M., Buchpiguel, C., Sordi, G.
University of São Paulo, Brazil, University of Vanderbilt

INTERNATIONAL AND STUDENT

P.38 Alpha Particle Attenuation on Dust-Loaded Air Filters
Wilkes, E.B., Gernatt, S.M.
Idaho National Laboratory

P.39 The Detection and Quantification of Surface Radioactive Contamination
Butikofer, T., Cummings, F., Brey, R.
Idaho National Laboratory, Idaho State University

P.40 Nanomaterials: Is it Safe Beyond a Doubt?
Gallaghar, R., Sun, L.
Applied Health Physics Inc.

P.41 Response Matrix of a Bonner Sphere Spectrometer with 6Li(Eu) Scintillator
Vega-Carrillo, H., Gallego, E., Lorente, A., Manzanares-Acuña, E.
Universidad Autonoma de Zacatecas, Universidad Politecnica de Madrid

P.42 Room Return
Vega-Carrillo, H., Gallego, E., Lorente, A., Manzanares, E.
Universidad Autonoma de Zacatecas, Universidad Politecnica de Madrid

P.43 Absorbed Dose in the Internal Organs of a Pregnant Woman Due to the I-131 Accumulated in her Thyroid
Vega-Carrillo, H., Manzanares-Acuña, E., Barquero, R.
Universidad Autonoma de Zacatecas, Hospital Rio Hortega, Valladolid Spain

P.44 Microstructure Damage of Aluminum Thin Films by 252Cf Irradiation
Sadi, S., Paulenova, A., Loveland, W., Watson, P.
Oregon State University

P.45 I-131 Patient Non-compliance in Nuclear Medicine
Perham, C.
University of Virginia

P.46 Comparison of X-ray Radiograph between MCNPX and Direct Ray-Tracing Using the VIP-Man Phantom
Gu, J., Xu, X.
Rensselaer Polytechnic Institute

P.47 Evaluation of Photodynamic Therapy-Induced Edema in the Rat Brain using Magnetic Resonance Imaging
Chighvinadze, D., Hirschberg, H., Patton, P.W., Madsen, S.J.
University of Nevada, Las Vegas, University of California, Irvine

P.48 Comparison Between Region of Interest Selection Techniques Used in Diffusion Tensor Imaging Applied to the Corpus Callosum
Lowe, D., Mangum, J., Patton, P.
University of Nevada, Las Vegas, Spring Valley Nevada Imaging Centers Amigenics

NON-IONIZING

P.49 Measuring Radiofrequency and Microwave Radiation from Varying Signal Strengths
Gaul, W., Davis, B.
Chesapeake Nuclear Services, NASA Dryden Flight Research Center

P.50 The Use of Histomorphometry to Determine the Extent of Cutaneous Laser Injury Thickness
Walker, C., Eurell, T., Johnson, T.
Colorado State University

OPERATIONAL HEALTH PHYSICS

P.51 An Innovative Approach for Training Radiological Control Technician Trainees
Killand, B.
Fluor Hanford

P.52 Implementing the New Supplementary Ionizing Radiation Warning Symbol
Mac Kenzie, C.
International Atomic Energy Agency

P.53 Assessment of Skin Doses from Fallout Sources of Finite Size
Weitz, R.L., Barss, N. M.
Science Applications International Corporation

P.54 An Assessment Tool for Evaluating Radiation Exposures to Nursing Infants from Internally Contaminated Mothers
Timilsina, B., Farfan, E., Donnelly, E.
Idaho State University, Savannah River National Laboratory, Centers for Disease Control and Prevention

P.55 Validation of the Point-Kernel Shielding Program ISO-PC Version 2.2
Rittmann, P.
Fluor Government Group

P.56 Uncertainty Considerations for Decision Levels and Detection Limits Utilizing Computer Codes when the Blank Count Time is an Integer Number of Times Greater than the Sample Count Time
Potter, W., Strzelczyk, J.
Consultant, Sacramento, University of Colorado Health Science Center

P.57 Prenatal Radiation Exposure
Donnelly, E., Ozcan, I.*, Farfan, E.
Centers for Disease Control and Prevention, Idaho State University, Savannah River National Laboratory
MONDAY

P.58 Acute Radiation Syndrome and Related Deterministic Effects
Donnelly, E., Smith, J., Naeem, S.*, Farfan, E.
Centers for Disease Control and Prevention, Idaho State University, Savannah River National Laboratory

REGULATORY/LEGAL

P.59 Implications of the “Privacy Movement” on a Corporate Radiation Safety Program
Kay, S.E., Mays, T.L.
Eli Lilly and Company

P.60 Risks Associated with Management of a Radiation Safety Program
O’Dou, T.
University of Nevada Las Vegas

P.61 Overview of New Nuclear Reactor Permitting Activities: Preparing for Reviews of Combined Licenses
Parkhurst, M., Miller, B., Stegen, J.A., Kugler, A.
Pacific Northwest National Laboratory, US Nuclear Regulatory Commission

RISK ASSESSMENT

P.62 Prioritization of Los Alamos National Laboratory Repackaging Campaign Using Package Surveillance Data
Hoffman, J., Kelly, E., Smith, P.
Los Alamos National Laboratory

SPECIAL INTERNATIONAL POSTER SESSION

P.63 Measurement of Uranium Uptake by Agricultural Crops at Khan Al-Zabeeb – Jordan
Al-Kharouf, S., Dababneh, M., Al-Hamarneh, I.
Royal Scientific, Jordan, Al-Balqaa Applied University, Jordan

P.64 Analysis of the Radioactivity in the Spa “Elguea,” Cuba
Gómez, I., Zerquera, J., González, J., Ferrera, E., Castro, G.
Centro de Protección e Higiene de las Radiaciones

P.65 The Status of Korean Radiological Emergency Preparedness and Development of Radiological Dose Assessment Systems
Han, M.H., Kim, E.H., Suh, K.S., Hwang, W.T., Jeong, H.J.
Korea Atomic Energy Research Institute, Korea

P.66 Potential Errors in Committed Effective Dose Due to the Assumption of a Single Intake Path in Interpretation of Bioassay Results
Lee, J.I., Lee, J.K.
Korea Atomic Energy Research Institute, Republic of Korea, Hanyang University

P.67 Radiological Protection in Hemodynamics Lab
Prado, N., Luz, E., Canevaro, L.
Instituto Militar de Engenharia, Brazil, Instituto de Radioproteção e Dosimetria, Brazil

P.68 Activity Optimization in HMPAO - 99mTc Brain SPECT
Pérez-Díaz, M., Díaz-Rizo, O., Aparicio, E., Díaz, R., Rodriguez, C.
Central University of Las Villas, Cuba, University Hospital Celestino Hdez, Cuba

P.69 Preliminary Study about Radionuclidic Purity and Radiochemical Stability of [153Sm]Sm-EDTMP to Elaborate a Dosimetric Model in Bone Metastases Palliation Cares and Osteosarcoma Therapy
Ridone, S., Arginelli, D., Bortoluzzi, S., Montalto, M., Nocente, M., Inglese, E., Matheoud, R.
Secco Research Centre of Saluggia, Italy, Hospital Maggiore della Carità di Novara and University of Studies of Eastern Piedmont, Italy

P.70 137Cs Activity Concentrations Determined in the Vertical Profile of Sandy Beaches of Italy
Rizzotto, M., Velasco, H., Merkis, N., Toso, J.
Instituto de Matemática Aplicada San Luis (IMASL), Argentina

P.71 Intercomparison of KAP-meter, TLDs and Barracuda System with R-100 Detector
Basiae, B., Beganoviae, A., Dzaniae, S., Drijeviae, A.
Sarajevo University, Bosnia and Herzegovina, Institute of Public Health of Federation of Bosnia and Herzegovina

P.72 Two-TLD Personal Dosimetry in Interventional Radiology
Basiae, B., Beganoviae, A., Drijeviae, A., Sejmen, E.
Sarajevo University, Bosnia and Herzegovina, Institute of Public Health of Federation of Bosnia and Herzegovina

P.73 Environmental Protection Against Ionizing Radiation - The Challenge of an Umbrella Concept
Steiner, M., Hornung, L., Willrodt, C., Kirchner, G.
Federal Office for Radiation Protection, Germany

P.74 The Assessment of Radon Exposure in Workplaces: Ispesl Radon Measurement Laboratory Approach
Trevisi, R.B., Leonardi, F., Tonnarini, S.
National Institute for Occupational Safety and Prevention, Italy

P.75 Verification of the Sealed Radioactive Sources in Federation of Bosnia and Herzegovina
Vidic, A., Dzanic, S.
Institute for Public Health of Federation of Bosnia and Herzegovina-Radiation Protection Center, Sarajevo

3:30-5:00 PM A105

MPM-A: NIOSH Dose Reconstruction Project
Co-Chairs: Dade Moeller and Jim Neton

3:30 PM MPM-A.1
The NIOSH Dose Reconstruction Project: Creating and Managing a Pioneering Scientific Program
Townsend, R.D., Moeller, M.P.*, Dooley, D.A.
Oak Ridge Associated Universities, Dade Moeller & Associates, MJW Corporation

3:45 PM MPM-A.2
The Scientific Basis of Dose Reconstruction
Toohey, R.E., Neton, J.W.
Oak Ridge Associated Universities, Oak Ridge, National Institute for Occupational Safety and Health, Cincinnati
MONDAY

4:00 PM MPM-A.3
Development of Rapid Methods for Assessing Doses from Internally Deposited Radionuclides
Maher, E.F., McCartney, K.A.*, Mize, B.D., Sun, L.S., Siebert, S.R.
Dade Moeller & Associates, MJW Inc.

4:15 PM MPM-A.4
Implications of Claimant Favorability of Dose and Probability of Causation Calculations Under EEOICPA Subtitle B
Merwin, S., Stewart, D.*, Smith, M., Potter, K., Kimpan, K., Cragle, D., Hinnefeld, S.
Dade Moeller & Associates, Oak Ridge Associated Universities, NIOSH Office of Compensation Analysis and Support

4:30 PM MPM-A.5
The NIOSH Dose Reconstruction Program: Commentary and Conclusions
Neton, J., Elliott, L.
NIOSH

4:45 PM MPM-A.6
Uncertainty and Variability in Historical Time-Weighted Average Exposure Data
Davis, A., Strom, D.
Pacific Northwest National Laboratory

3:30-5:00 PM A106

MPM-B: Reactor Health Physics
Chair: Matt Arno

3:30 PM MPM-B.1
Innovative Approach for Radon Control
Moeller, D., Bump, S.*, Desrosiers, A.
Dade Moeller & Associates

3:45 PM MPM-B.2
EPD-N2 Neutron Correction Factor
Earls, L., Stoicescu, L.
STPNOC

4:00 PM MPM-B.3
EPRI Alpha Monitoring Guidelines for Operating Nuclear Power Stations
Russell, M., Bushart, S., Cardarelli, R., Darois, E., Oliveira, R.
SCE, EPRI, CNA, RSCS, ANI

4:15 PM MPM-B.4
Neutron Measurements at Beaver Valley Power Station
Scherpelz, R.I., McConn, R.J., Conrady, M.M., Lebda, J.T.
Battelle Pacific Northwest Division, FirstEnergy Nuclear Operating Company

4:30 PM MPM-B.5
An Overview of Health Physics Activities During Spent Nuclear Fuel Shipments
Vasudevan, L.
Texas A&M University

4:45 PM MPM-B.6
Analysis of C-14 Accumulation at Nuclear Facilities
Haque, M., Miller, D.
University of Illinois

3:30-5:15 PM B110-112

MPM-C: Regulatory/Legal Issues
Co-Chairs: Cynthia Jones and Eva Hickey

3:30 PM MPM-C.1
Licensing the Construction of Emission Units of the Hanford Tank Waste Treatment and Immobilization Plant (WTP) to use Non-AG-1 (alternate technology standards) as justified by the Cost Benefit Analysis evaluation of WAC 246-247-110(16)
Laws, G.
Washington State Department of Health

3:45 PM MPM-C.2
Radiological Environmental Reviews for New Reactor Licensing
Hickey, E., Stoetzel, G., Krieg, R., Kugler, A.
Pacific Northwest National Laboratory, US Nuclear Regulatory Commission

4:00 PM MPM-C.3
Updating the IAEA International Nuclear Event Scale Reporting System
Jones, C.
US Nuclear Regulatory Commission

4:15 PM MPM-C.4
Consequences of Altering the Current Evaluation Process for Devices Containing Radioactive Sources
Chapel, S.
IRSC, Inc.

4:30 PM MPM-C.5
Unexpected Changes in a University Radiation Safety Program
O'Dou, T.
University of Nevada Las Vegas

4:45 PM MPM-C.6
Performing a Radiation Protection Program Assessment
Marshall, G.
Philotechnics

5:00 PM MPM-C.7
Health Physics Practices and Legal Determinations
Johnson, R., McKay, L.
Blank Rome, LLP

3:30-4:15 PM B113-114

MPM-D: First Responders
Chair: Tom O’Connell

3:30 PM MPM-D.1
Training First Responders in Washington State to Respond Safely to a Radiological or Nuclear Attack or Accident
Conklin, A.W., Wainhouse, L.E., Henry, M.E., Butowicz, K., Fordham, E.
Washington State Department of Health
MONDAY

3:45 PM MPM-D.2
Veterans Healthcare Administration Medical Emergency Radiological Response Team
Bravenec, J., Tuttle, B., Schumacher, T.
Veterans Affairs Medical Center

4:00 PM MPM-D.3
US Air Force - Radiation Assessment Team (AFRAT) Reorganization
Nichelson, S.
AFIOH/SDR

3:30-5:00 PM B115-116
MPM-E: Waste Management
Chair: Susan Jablonski

3:30 PM MPM-E.1
NORM/TENORM Waste Disposal in Colorado: The Deer Trail Landfill
Dade Moeller & Associates, Clean Harbors Environmental Services

3:45 PM MPM-E.2
Neptunium Speciation in Solutions Relevant to High Level Waste Processing
Matteson, B., Tkac, P., Paulenova, A.
Oregon State University

4:00 PM MPM-E.3
Speciation of Plutonium and Other Actinides Under UREX Process Conditions
Tkac, P., Paulenova, A., Matteson, B.
Oregon State University

4:15 PM MPM-E.4
Probabilistic Performance Assessment of a Low-Level Radioactive Waste Disposal Site on the Nevada Test Site
Shott, G., Yucel, V., Desotell, L., Pyles, G
National Security Technologies LLC, National Nuclear Security Administration

4:30 PM MPM-E.5
Los Alamos National Laboratory (LANL) & Nuclear Energy Corporation of South Africa (NECSA) Cooperate in IAEA Spent High-Activity Radioactive Sources (SHARS) Hot Cell Pilot-Project in South Africa
Tompkins, J.A., Liebenberg, G., Al-Mughrabi, M.
Los Alamos National Laboratory, Nuclear Energy Corporation of South Africa, IAEA

4:45 PM MPM-E.6
Development of a Biosphere Model for Waste Incidental to Reprocessing and Non-High-Level Waste Consultations
Simpkins, A., Howard, L., LaPlante, P., Mancillas, J., Pensado, O., Turner Gray, A.
Southwest Research Institute, US Nuclear Regulatory Commission
TUESDAY

7:00-8:00 AM A105
CEL3  ON ALERT: Post 9/11 Integrated Emergency Planning
Lawrence T. Dauer
Memorial Sloan-Kettering Cancer Center

7:00-8:00 AM A106
CEL4  Image-Based Methods in Internal Dose Calculations – Current Status
Mike Stabin
Vanderbilt University

8:30 AM-Noon A105
TAM-A: AAHP Special Session on Health Physics Education: Status of Academic Programs, Student Recruitment, Funding and Accreditation
Co-Chairs: Jim Bogard, Wes Bolch and Derek Jokisch

Status of HP Academic Programs and Student Recruitment
8:30 AM TAM-A.1
Summary of HP Manpower and Future Demand
Nelson, K.
HPS President-elect

9:00 AM TAM-A.2
A Review of HP Academic Programs in the US
Bolch, W.
University of Florida

Program Descriptions
9:15 AM TAM-A.3
Radiation Protection Technology Curriculum Development
Miller, W., Jonassen, D., Schmidt, M., Easter, M., Ionas, G., Marra, R., Etter, R., Meffert, B.
University of Missouri-Columbia

9:30 AM TAM-A.4
The Bloomsburg University Health Physics Program
Simpson, D.
Bloomsburg University

9:45 AM TAM-A.5
The Health Physics Major at Francis Marion University
Peterson, D., Fulmer, P.
Francis Marion University

10:00 AM BREAK

10:30 AM TAM-A.6
Health Physics Programs at Texas A&M University
Poston, Sr., J.
Texas A&M University

10:45 AM TAM-A.7
Oregon State University’s Radiation Health Physics Program
Higley, K., Binney, S., Reese, S., Reyes, J.
Oregon State University

11:00 AM TAM-A.8
Description of the Health Physics Program at The University of Tennessee
Miller, L.
The University of Tennessee

11:15 AM TAM-A.9
Radiological Sciences Program at the University of Massachusetts Lowell
French, C.S., Tries, M. A., Medich, D. C.
University of Massachusetts Lowell

11:30 AM Panel Discussion and Q&A
Competition from Other Fields: How Does HP Compete?

8:30 AM-NOON A106
TAM-B: External Dosimetry A
Co-Chairs: Jack Fix and Tosh Ushino

8:30 AM TAM-B.1
DOE Mayak External Dose Reconstruction
Mayak Production Association, Dade Moeller & Associates, Pacific Northwest National Laboratory

8:45 AM TAM-B.2
Organ Dose Calculations for Mayak Worker Dose Assessment
Scherpelz, R.I., Smetanin, M., Choe, D.O., Vasilenko, E., Gorelov, M., Fix, J.J.
Pacific Northwest National Laboratory, Mayak Production Association, University of Utah, Dade Moeller and Associates

9:00 AM TAM-B.3
Optically Stimulated Luminescence (OSL) and Thermoluminescent (TL) Response of SiO2 Optical Fiber to Beta Radiation
Bogard, J.S., Golzarri, J.I., Espinosa, G
Oak Ridge National Laboratory, Universidad Nacional Autónoma de México

9:15 AM TAM-B.4
Determination of Neutron Correction Factors for Personnel and Area Dosimeters Used in the Vicinity of Spent Fuel Storage Casks
Rathbone, B.A., Scherpelz, R. I.
Pacific Northwest National Laboratory

9:30 AM TAM-B.5
Recent Development in GDS Real-time Optical Fiber in vivo Dosimeter
Ushino, T., Justus, B., Huston, A., Ning, H., Miller, R.
Global Dosimetry Solutions, US Naval Research Laboratory, National Cancer Institute

9:45 AM TAM-B.6
Preliminary External and Internal Dosimetry Data from a New Set of Mother/Fetus Models
Zhang, J., Taranenko, V., Zhang, D., Xu, X., Shi, C.
Rensselaer Polytechnic Institute, Cancer Therapy and Research Center, San Antonio, TX
TUESDAY

10:00 AM BREAK

10:30 AM TAM-B.7
Effect of Pediatric Subcutaneous Fat Thickness on Effective Dose for External Radiation Exposure: Monte Carlo Calculation Study
Lee, C., Lodwick, D., Hasenauer, D., Bolch, W.
University of Florida

10:45 AM TAM-B.8
Implementing the Weighting Factors to Determine Occupational Dose
Russell, M., Lantz, M., Cooper, T., Sewell, S., Duran, D.
SCE, PVNGS

11:00 AM TAM-B.9
Analysis of Anomalous Thermoluminescence Glow Curves
Potter, C., Sanchez, D.
Sandia National Laboratories

11:15 AM TAM-B.10
Hybrid Computational Phantom VOXMAT: Combination of Voxel and Mathematical Representation of the Anatomy
Akkurt, H., Eckerman, K.*
Oak Ridge National Laboratory

11:30 AM TAM-B.11
Testing of a Hybrid Approach for Rapid Direct Radiation Gamma Dose Assessments for Complex Source/Receptor Geometries
Povetko, O., Benke, R., Kouznetsov, A., Golikov, V.
Southwest Research Institute, Consultant, Calgary, Canada, Federal Radiological Center, St-Petersburg, Russia

11:45 AM BREAK

10:15 AM TAM-C.4
Monte Carlo-Based Calculations of Neutron Activation in a Medical Linear Accelerator
Bednarz, B., Xu, X. G., Taranenko, V.
Rensselaer Polytechnic Institute

9:00 AM TAM-C.3
Prostate Volume Delineation and Seed Localization using a 3 T Magnetic Resonance Imager
Davis, J., Patton, P.
University of Nevada-Las Vegas

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**TUESDAY**

8:00 AM-NOON B113-114  
**TAM-D: Community Preparedness for Radiological Terrorism Response Special Session**

Co-Chairs: Brooke Buddemeier and William Rhodes

8:00 AM **TAM-D.1**  
An NRC Commissioner's Perspective on Preparedness for Radiological Emergencies  
Commissioner Jaczko  
US Nuclear Regulatory Commission

8:30 AM **TAM-D.2**  
Session Introduction by Chairs

8:40 AM **TAM-D.3**  
Radiological Dispersal Device Characteristics and Limitations  
Harper, F., Rhodes, W.  
Sandia National Laboratory

9:00 AM **TAM-D.4**  
The New York City Plan to Respond to a Radiological Emergency  
Musolino, S.  
Brookhaven National Laboratory

9:15 AM **TAM-D.5**  
Radiological-Community-Preparedness-Resources Pilot Program with the Portland, OR Emergency Response Community  
Letellier, B., Royal, M.  
Los Alamos National Laboratory, Hicks and Associates

9:30 AM **TAM-D.6**  
An Overview of NCRP Commentary No. 19  
Poston, Sr., J.  
Texas A&M University

9:45 AM **TAM-D.7**  
Break

10:15 AM **TAM-D.8**  
Handbook for Responding to a Radiological Dispersal Device First Responders Guide: The First 12 Hours  
New York State Department of Health, Delaware Department of Health & Social Services, New Jersey Department of Environmental Protection, Arizona Radiation Regulatory Agency, County of Los Angeles, Department of Public Health, University of Iowa, Oakdale Campus, Massachusetts Department of Public Health

10:45 AM **TAM-D.9**  
IAEA Manual for First Responders to a Radiological Emergency  
McKenna, T., Buglova, E., O’Connell, T.  
International Atomic Energy Agency, Austria

11:00 AM **TAM-D.10**  
Population Monitoring: Development of Planning Guidance for State and Local Officials  
Ansari, A., Whitcomb, R., Miller, C.  
Centers for Disease Control

11:15 AM **TAM-D.11**  
Interagency Guidance for Response and Recovery Following an Radiological Dispersal Device (RDD) or Improvised Nuclear Device (IND) Attack  
MacKinney, J.A.  
US Environmental Protection Agency

11:30 AM **Panel Discussion**  
National and International Guidance for Emergency Responders

NOON **Decommissioning Section Business Meeting**

8:30 AM-NOON B115-116  
**TAM-E: Environmental Special Session**

Co-Chairs: Jan Johnson and Craig Little

8:30 AM-NOON B117-119  
**TAM-F: Uncertainty Special Session**  
Sponsored by the Decommissioning Section

Co-Chairs: Carl Gogolak and Joseph Shonka

8:30 AM **TAM-F.1**  
Uncertainty in Energy Resolution Measurements  
Volkovitsky, P., Yen, J., Cumberland, L.  
National Institute of Standards and Technology (NIST)

8:45 AM **TAM-F.2**  
Uncertainty Calculations in Radiation Instrument Calibrations  
Slowey, T., Bryson, L.  
K&S Associates, Inc.

9:00 AM **TAM-F.3**  
The Standard Poisson Table  
Bramlitt, E.  
University of New Mexico

9:15 AM **TAM-F.4**  
Measurement Uncertainty from In-Situ Gamma Spectroscopy of Nonhomogeneous Containers and from Laboratory Assay  
Bronson, F., Atrashkevich, V.  
Canberra Industries, Consultant

9:30 AM **TAM-F.5**  
The Importance of Uncertainty  
Gogolak, C.  
Consultant

9:45 AM **Break**

10:15 AM **TAM-F.6**  
Characteristic Limits in the Classical GUM Approach and in the Monte Carlo Approach: - ISO 11929 and Beyond  
Michel, R.  
Leibniz Universitaet Hannover, Germany
TUESDAY

10:45 AM TAM-F.7
Uncertainty Analysis for Air-Kerma Rate Measurements from Gamma-Ray Beams Using Ionization Chambers
Minniti, R.
National Institute of Standards and Technology (NIST)

11:00 AM TAM-F.8
Uncertainty Analysis for Gamma-ray Spectrometry Measurements using High Purity Germanium Detectors
Pibida, L., Hammond, M., Unterweger, M.
National Institute of Standards and Technology (NIST)

11:15 AM TAM-F.9
Applied Uncertainty Estimates in the Department of Energy Laboratory Accreditation Program
Schwahn, S.
U.S. Department of Energy

11:30 AM TAM-F.10
Methods for Addressing Uncertainties in the Plutonium Source Term from Los Alamos
Shonka, J., O’Brien, J., Widner, T.
Shonka Research Associates, ChemRisk

11:45 AM TAM-F.11
Everything Is Lognormal or Is It?
Strom, D.
Pacific Northwest National Laboratory

2:30-5:15 PM A-105
TPM-A: AAHP Special Session on Health Physics Education
Funding and Accreditation of Academic Programs
Co-Chairs: Jim Bogard, Wes Bolch and Derek Jokisch

2:30 PM TPM-A.1
Academic Accreditation and the Health Physics Society
Brey, R.
Idaho State University

Funding of Academic Programs

2:45 PM TPM-A.2
Supporting University Health Physics Education in a Changing Environment
Gutteridge, J.
US Department of Energy

3:15 PM TPM-A.3
NIOSH Training Programs in Health Physics
Borak, T.B., Johnson, T.E.
Colorado State University

3:30 PM TPM-A.4
Congress and the Health Physics Human Capital Crisis
Dinger, K., Connolly, D.
Health Physics Society, Capitol Associates, Inc.

3:45 PM BREAK

4:15 PM TPM-A.5
Health Physics Fellowships
Williamson, C.
SCUREF

4:30 PM TPM-A.6
Health Physics Society’s Assistance in Academic Education
Jokisch, D.
Francis Marion University

4:45 PM Panel Discussion and Q&A
Current and Future Funding of Academic Programs

5:15 PM AAHP Open Meeting

2:30-3:45 PM A106
TPM-B: External Dosimetry B
Co-Chairs: Gus Potter and Tim Kirkham

2:30 PM TPM-B.1
A Novel Mouse Dosimetry with MOSFET Technology in Orthovoltage X-ray Irradiator
Brady, S., Muramoto, G., Toncheva, G., Daigle, L., Nguyen, N., Chute, J., Dewhirst, M., Yoshizumi, T.
Duke University

2:45 PM TPM-B.2
Measurement of a TLD Neutron Dose Factor for a Holtec MPC
Burns, K., Hertel, N. E., Burgett, E., Blaylock, D., Patton, B. P., Kuryla, J.
Georgia Institute of Technology, Farley Nuclear Plant, Georgia Power Environmental Laboratory

3:00 PM TPM-B.4
Factors Influencing the Accuracy and Precision of Thermoluminescent Detector Calibrations
Harvey, J., Thomas, E.*, Haverland, N., Kearfott, K.
University of Michigan

3:15 PM TPM-B.5
Determination of Minimum Detectable Dose and Dose Response Linearity for Glow Curve Analysis of Five Thermoluminescent Detector Materials
Harvey, J., Thomas, E., Haverland, N., Hammargren, B.*, Kearfott, K.
University of Michigan

3:30 PM TPM-B.6
Characterization of the Glow Curve Peak Fading Properties of Six Common Thermoluminescent Materials
Haverland, N., Harvey, J.*, Kearfott, K.
University of Michigan

2:30-5:00 PM B110-112
TPM-C: Decommissioning
Co-Chairs: Joseph Shonka and Patricia Lee

2:30 PM TPM-C.1
Decommissioning the Rutgers University Radioactive Waste Processing Facility: Challenges And Successes
McDermott, P.J.
Rutgers University
2:45 PM TPM-C.2
Historical Site Assessment of University Facilities
Caracappa, P.
Rensselaer Polytechnic Institute

3:00 PM TPM-C.3
Decommissioning Fifty Years of History at a Small College
Kay, M., Dibblee, M.
AMBRY, Inc.

3:15 PM TPM-C.4
Residual Activity and Dose Rate Considerations for Disposal of HEU from a Small Research Reactor
Thatcher, A., Andes, T.
NEXTEP CG, BWXT Y-12

3:30 PM BREAK

4:00 PM TPM-C.5
Spatially-Dependent Measurements of Surface and Near-Surface Radioactive Material Using In situ Gamma Ray Spectrometry (ISGRS) for Final Status Surveys
Oak Ridge Associated Universities, US Nuclear Regulatory Commission

4:15 PM TPM-C.6
Decommissioning a Beta Thickness Gauge by Recycling the Krypton 85 Gas
Kay, M., Dibblee, M.*
AMBRY, Inc.

4:30 PM TPM-C.7
Decommissioning Cost Estimates
Marshall, G.
Philotechnics

4:45 PM TPM-C.8
First Two MARSSIM Decommissionings of CDC Laboratories
Keith, L., Simpson, P., Bowman, D., Lirette, N.
Agency for Toxic Substances and Disease Registry, Centers for Disease Control and Prevention

2:45 PM TPM-D.2
Dose Assessment for Reentry or Reoccupancy from Areas Contaminated by a Radiological Dispersal Device
Sullivan, T., Musolino, S., DeFranco, J.
Brookhaven National Laboratory, New York City Department of Health

3:00 PM TPM-D.3
Improving National Preparedness Using the Nuclear Scenario
Buddemeier, B.
Lawrence Livermore National Laboratory

3:15 PM BREAK

3:45 PM TPM-D.4
Options for Response to an Urban Nuclear Detonation
Wheeler, R., Brandt, L., Buddemeier, B.*
Lawrence Livermore National Laboratory, Sandia National Laboratory

4:00 PM TPM-D.5
Title: Federal and State Resources Available to Respond to a Radiological/Nuclear Emergency
Groves, K.L., Maiello, M.
S2-Sevorg Services, LLC, Wyeth Medical

4:15 PM TPM-D.6
Klemic, G., Buddemeier, B., Bailey, P., Monetti, M., Breheny, C., Hall, H.
US Department of Homeland Security, Environmental Measurements Laboratory, Lawrence Livermore National Laboratory

2:30-4:30 PM B113-114
TPM-D: Community Preparedness for Radiological Terrorism Response Special Session
Co-Chairs: Brooke Buddemeier and William Rhodes

2:30 PM TPM-D.1
Radiological Dispersal, Polonium-210, and Lessons for Public Health
Miller, C.W., Whitcomb, Jr., R.C., Ansari, A., Nemhauser, J.B., McCurley, C.
Centers for Disease Control
WEDNESDAY

7:00-8:00 AM

**CEL5**
Ingestion Derived Intervention Levels (DILs) and Derived Response Levels (DRLs) for Emergency Planning and Response
Patricia L. Lee
Savannah River National Laboratory (SRNL)

7:00-8:00 AM

**CEL6**
2006 Gamma Irradiator Accident in Belgium
Mark Smith
Sterigenics International

8:30 AM-NOON

**WAM-A: Environmental**
Co-Chairs: Matthew Barnett and Linnea Wahl

8:30 AM

**WAM-A.1**
A Review of Residential Areas Developed around Manhattan Project and Early AEC Sites and Potential Pathways for Public Exposures
Widner, T.E., Robinson, K.D., Flack, S.M.
ChemRisk, Inc.

8:45 AM

**WAM-A.2**
A Review of the World’s First Test of an Atomic Bomb (Trinity Site, July 16, 1945) and Potential Radiation Exposures to Residents of New Mexico
Widner, T.E., Flack, S.M.
ChemRisk, Inc.

9:00 AM

**WAM-A.3**
Risk Analysis in Response to Community Opposition to Housing Development Based on Strontium-90 in Soil and Construction Dust
Greger, L.R.
California Department of Health

9:15 AM

**WAM-A.4**
Evaluation of U.S. Nuclear Power Plant Radiological Environmental Monitoring Programs
Harris, J., Miller, D.
Purdue University, University of Illinois at Urbana-Champaign

9:30 AM

**WAM-A.5**
Historic Environmental Thermoluminescent Dosimeter Readings at the Hanford Site
Antonio, E., Rathbone, B., Poston, T.
Pacific Northwest National Laboratory

9:45 AM

**WAM-A.6**
Spatial Variability of Partition Coefficients for Radionuclides at the Savannah River Site
Clemson University, Savannah River National Laboratory

10:00 AM

**WAM-A.7**
Semi-Automated Areal Survey System
Hensley, J., Harcek, B., Nichelson, S.*, Pugh, D.
AFIOH/SDR

10:45 AM

**WAM-A.8**
Review of Radioactive Materials Released from Production Reactors and Public Exposures
Dua, S., Mwaisela-Rose, J., Lagos, L., Roelant, D., Srivastava, R.
Florida International University

11:00 AM

**WAM-A.9**
The Analysis of Contaminated HEPA Filters
LeBaron, G., Bates, J., Wooley, W.*
Fluor Hanford, US Department of Energy

11:15 AM

**WAM-A.10**
Evaluating Radioactive Air Emissions from a Minor Source under Rad-NESHAP
Anderson, K.I., Fuehne, D.P.*
Los Alamos National Laboratory

11:30 AM

**WAM-A.11**
Development of a Tritium Dilution Factor from Measured Laboratory Emissions and Localized Ambient Air Sampling
Barfuss, B., Barnett, J., Fritz, B.
Pacific Northwest National Laboratory

11:45 AM

**WAM-A.12**
Comparison of Modeled Radionuclide Doses and Air Concentrations in the Environment Using the CAP88-PC Software
Rhoads, K., Aaberg, R.L., Staven, L.H., Rokkan, D.J.
Pacific Northwest National Laboratory, Fluor Hanford, Inc.

1:30 PM-5:00 PM

**WAM-B: Accelerator Section Session**
Co-Chairs: Kamran Vaziri, Scott Walker

1:30 PM

**WAM-B.1**
Accelerator Shielding at High Energy Accelerators: Past to Present
Sullivan, A.H. (G. William Morgan Lecturer)
CERN (Retired)
(Presented by R. Thomas)

2:00 PM

**WAM-B.2**
High Energy Activation Foils In a High Energy Neutron Beam
Walker, L.S., James, M., Nakao, N., Oostens, J.*
Los Alamos National Laboratory, Fermi National Laboratory, Campbellsville University

2:15 PM

**WAM-B.3**
Confirmatory Measurements for Radioactive Air Production at Stanford Linear Accelerator Center
Kerimbaev, M., Liu, J.
Stanford Linear Accelerator Center

2:30 PM

**WAM-B.4**
Search For Additional Sources of Tritium in the NuMI Tunnel
Vaziri, K.
Fermi National Accelerator Laboratory
WEDNESDAY

9:45 AM WAM-B.5
Estimation of Shielding and Radiation Dose for a Pre-Separator Area for Rare Isotope Production via Projectile Fragmentation
Baek, I., Ronningen, R., Bollen, G.
Michigan State University

10:00 AM WAM-B.6
Initial Operating Experience at the Spallation Neutron Source
Gregory, D.
Oak Ridge National Laboratory

10:15 AM BREAK

10:45 AM WAM-B.7
Shielding Requirements for National Synchrotron Light Source - II
Job, P.K., Casey, W.R.*
Brookhaven National Laboratory

11:00 AM WAM-B.8
Monitoring Stray Neutrons with Stilbene Detectors Efficiently
Brodsky, A.
Georgetown University

11:15 AM WAM-B.9
Some Operational Experiences with the Personnel Dosimetry Program at Stanford Linear Accelerator Center (SLAC)
Tran, H., Liu, J.
Stanford Linear Accelerator Center (SLAC)

11:30 AM WAM-B.10
Testing of a Novel Shielding Material in High Energy Particle Beams
Shannon, M., Burgett, E., Hertel, N., Blaylock, D., Burns, K., Dewji, S., Lobracco, C., Howell, R., Harrison, C., Grulke, E.
Georgia Institute of Technology, Emory University School of Medicine, University of Kentucky

11:45 AM WAM-B.11
The Response Change of Radiation Detection Instrumentation to a Magnet Field from a Dipole Magnet
Walker, L.S., Justus, A., Olsher, R., Gordon, L.
Los Alamos National Laboratory

NOON Accelerator Section Business Meeting

8:30-11:45 AM B110-112

WAM-C: Internal Dosimetry and Bioassay
Co-Chairs: Elizabeth Brackett and Tim Lynch

8:30 AM WAM-C.1
Using Energy Response Data for Portal Monitors to Create a Physical Basis for the Selection of Radiation Sources used to Mimic a Specific Mixture of Dry Activated Waste in INPO-Mandated Phantom Tests when Replacing Annual Whole Body Counts with Use of Portal Monitors
Hubble, H.
Georgia Institute of Technology

8:45 AM WAM-C.2
Acute Toxicity of Uranium: A Brief Review with Special Reference to Man
Kathren, R., Burkin, R.
Washington State University, Areva NP, Inc.

9:00 AM WAM-C.3
Radiation Measurements Made in Belarus during the First Few Weeks Following the Chernobyl Accident
Zhukova, O., Podgaiskaya, M., Germenchuk, M., Bouville, A., Luckyanov, N., Voillezé, P., Drozdovitch, V.*
Republican Center of Radiation Control and Environmental Monitoring, Minsk, Belarus, National Cancer Institute, MJP Risk Assessment, Inc.

9:15 AM WAM-C.4
Modeling a Coaxial Germanium System Response to BOMAB Phantom Activity
Lynch, T., Traub, R.
Battelle, Pacific NW Division

9:30 AM WAM-C.5
Calibration of the HMLs Lung Counter as a Bone Counter, using a Knee Phantom
Kramer, G., Hauck, B., Capello, K.*
Health Canada

9:45 AM BREAK

10:15 AM WAM-C.6
Study of the Influence of Biokinetics of Radionuclides on the Calibration Coefficient of in vivo Counting by Monte Carlo Simulation
Blanchardon, E., Molokanov, A., Kramer, G., Franck, D., Lamart, S.*
IRSN, France, Institute of Biophysics, Moscow, Health Canada

10:30 AM WAM-C.7
The StandFast Whole Body Counter and the Sliced BOMAB Phantom: Efficiency as a Function of Number of Sources and Energy Modelled by MCNP5
Kramer, G., Capello, K.
Health Canada

10:45 AM WAM-C.8
The Variation of Dose to the Respiratory Tract Following the Inhalation of 1 ALI of Plutonium
Traub, R.
Pacific Northwest National Laboratory

11:00 AM WAM-C.9
Thoron Exposure and Lung Dose at a Rare Earth Processing Facility near Bangkok
Harley, N., Chittaporn, P., Wannitsooksumbut, W.
New York University School of Medicine, Thai, OAE, New York University

11:15 AM WAM-C.10
Efficiency Calibration of Bed Type Whole Body Counter Using Monte Carlo Simulations and Application to Intake Estimation of I-131
Kim, J., Choi, H., Lee, B., Lim, Y.*, Kim, C.
Radiation Health Research Institute, South Korea
**WEDNESDAY**

**11:30 AM**  
Dose Assessment and Distribution Map for Radon in Dwellings of North-West Iran  
Hadad, K., Mehdizadeh, S.  
Shiraz University, Iran

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**8:30-11:45 AM**  
**B113-114**  
**WAM-D: Homeland Security**  
Chair: Bill Rhodes

<table>
<thead>
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<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenter(s)</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>WAM-D.1</td>
<td>Los Alamos National Laboratory Project Recovers U.S.-Origin Neutron Sources from Australia</td>
<td>Tompkins, A.</td>
<td>Los Alamos National Laboratory-Off-site Source Recovery Project</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>WAM-D.2</td>
<td>Global Orphan Source Recovery Strategy and Implementation</td>
<td>Mac Kenzie, C.</td>
<td>International Atomic Energy Agency, Austria</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>WAM-D.3</td>
<td>Information Counter-Terrorism for Health Physicists</td>
<td>Van Cleef, D.</td>
<td>ORTEC</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>WAM-D.4</td>
<td>National Security, Health Physics and the Law of Unintended Consequences or Loose Lips... (Still) Sink Ships</td>
<td>Mansfield, W., Sprague, D.</td>
<td>Lawrence Livermore National Laboratory</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>WAM-D.5</td>
<td>Emergency Response Plans - How Fears May Affect Reality</td>
<td>Johnson, R.</td>
<td>Radiation Safety Academy</td>
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<tr>
<td>10:00 AM</td>
<td>BREAK</td>
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<tr>
<td>10:45 AM</td>
<td>WAM-D.8</td>
<td>Dosimetric Characterization and Monte Carlo Verification for an Active, Non-Intrusive Inspection System</td>
<td>Ozcan, I., Chandler, K., Ankrah, M., Smith, M., Spaulding, R., Farfan, E.</td>
<td>Idaho State University, Savannah River National Laboratory</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>WAM-D.9</td>
<td>Risk from Low Energy Radionuclide Dispersal</td>
<td>Waller, E., Perera, S., Erhardt, L., Haslip, D.</td>
<td>University of Ontario Institute of Technology, Defence R&amp;D Canada Ottawa</td>
</tr>
<tr>
<td>11:15 AM</td>
<td>WAM-D.10</td>
<td>Technical Assistance to First Responders Pilot Project</td>
<td>O'Connell, T. F.</td>
<td>Massachusetts</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>WAM-D.11</td>
<td>Does Wearable Radiation Shielding Have to Break the Bank?</td>
<td>Hubble, H., Shannon, M., Hertel, N.</td>
<td>Georgia Institute of Technology</td>
</tr>
</tbody>
</table>

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**8:30-11:45 AM**  
**B115-116**  
**WAM-E: Joint CRSO and RSO Special Session**  
Co-Chairs: Jim Schweitzer and Andy Miller

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>WAM-E.1</td>
<td>RSO’s - A Former Regulator’s Perspective</td>
<td>Paperiello, C.</td>
<td>Talisman International</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>WAM-E.2</td>
<td>Digital Radiation Safety</td>
<td>Jackson, A., Peck, D.</td>
<td>Henry Ford Health System</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>WAM-E.3</td>
<td>Radiation Safety and Emergency Management</td>
<td>Bravenec, J., Schumacher, T., Tuttle, B.</td>
<td>Veterans Affairs Medical Center</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>WAM-E.4</td>
<td>Electronic Distribution and Review of Protocols for Radiation Safety Committee Review</td>
<td>Richard, M.</td>
<td>Indiana University Medical Center</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>WAM-E.5</td>
<td>Small Program, Big Needs</td>
<td>Fisher, S.A.</td>
<td>California State University, Fullerton</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>BREAK</td>
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<tr>
<td>10:30 AM</td>
<td>WAM-E.7</td>
<td>Radiation Safety Aspects of Fluoroscopy</td>
<td>Jacob, N.</td>
<td>Rhode Island Hospital</td>
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<tr>
<td>10:45 AM</td>
<td>BREAK</td>
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<tr>
<td>11:00 AM</td>
<td>WAM-E.8</td>
<td>Risk from Low Energy Radionuclide Dispersal</td>
<td>Waller, E., Perera, S., Erhardt, L., Haslip, D.</td>
<td>University of Ontario Institute of Technology, Defence R&amp;D Canada Ottawa</td>
</tr>
</tbody>
</table>
**WEDNESDAY**

10:45 AM  WAM-E.8  
The Effectiveness of a Radiological Emergency Plan for Coordinating the Response to a Major Material Licensee Facility Fire  
PerkinElmer Life and Analytical Siences, Boston

11:15 AM  WAM-E.9  
A Leaking Sr-90 Sealed Source: Discovery, Resolution and Lessons Learned  
Dupré, S., Elwood, S.  
Princeton University

11:45 AM  RSO Section Business Meeting

2:30-5:00 PM A105

**WPM-A: Environmental**

Co-Chairs: Bernd Kahn and Robert A. Fjeld

2:30 PM  WPM-A.1  
Quantitative Comparison of Sample Preparation Methods for Alpha Spectrometry  
Stock, S., Gostic, J., Czerwinski, K., Sudowe, R.  
University of Nevada, Las Vegas

2:45 PM  WPM-A.2  
Evaluation of Total Effective Dose Equivalent Due to Naturally Occurring Radioactive Materials using Residual Radioactivity (RESRAD) Code  
Beauvais, Z., Kearfott, K.  
University of Michigan

3:00 PM  WPM-A.3  
Mapping of Naturally Occurring Radioactive Materials and Indoor Radon Gas Concentrations with Population and Land Type in Several North Central Mountain States  
Laird, J., Beauvais, Z., Whetstone, Z., Kearfott, K.  
University of Michigan

3:15 PM  WPM-A.4  
The Mobility of Radiocesium and Plutonium in Roach Lake in Southern Nevada  
Tabriz, M., Higley, K., Hodge, V., Steinberg, S.  
Oregon State University, University of Nevada Las Vegas

3:30 PM  BREAK

4:00 PM  WPM-A.5  
Determination of Cs-137 and Sr-90 in Selected Southeastern Idaho Watersheds  
Beitollahi, M., Gesell, T., Dunker, R., Kimmel, C.  
Idaho State University

4:15 PM  WPM-A.6  
Continuous Radionuclide Water Quality Analysis  
Gibb, R., Hanlon, J., Melnick, S., Salazar, D., Trelease, A., Caracappa, P.  
Rensselaer Polytechnic Institute

4:30 PM  WPM-A.7  
U-Series Concentration in Surface and Ground  
Hadad, K., Doulatdar, R.  
Shiraz University, Iran

4:45 PM  WPM-A.8  
Post-Chernobyl Kiev in October 1986  
Thomas, R.  
California

2:30-4:30 PM A106

**WPM-B: Bioeffects**

Chair: David Hearnsberger

2:30 PM  WPM-B.1  
A Proposed Ultra-Low Level Radiation Biology Research Facility at the Carlsbad, New Mexico, Waste Isolation Pilot Plant (WIPP)  
Gomez, L., Brenner, D., Raabe, O.  
Orion International Technologies, Inc., Columbia University, University of California, Davis

2:45 PM  WPM-B.2  
Variation in Gamma Emitter Concentration in Urine in a High Background Region  
Zhang, R., Crawford, E., Johnson, T.  
Colorado State University

3:00 PM  WPM-B.3  
A 131I Biokinetic Model with Application to Hyperthyroid Patients  
Melo, D., Bouville, A., Simon, S., Brill, B., Zanzonico, P., Stabin, M.  
National Cancer Institute, Vanderbilt University, Memorial Sloan-Kettering Cancer

3:15 PM  BREAK

3:45 PM  WPM-B.4  
A Report from the BiodosEPR-2006 Consensus Committee on Biodosimetric Methods to Evaluate Acute Radiation Doses at Short Times After Exposure  
Swartz, H., Schauer, D.  
Dartmouth Medical Center, NCRP

4:00 PM  WPM-B.5  
A Report from the BiodosEPR-2006 Consensus Committee on Biodosimetric Methods to Evaluate Radiation Doses at Long Times After Exposure  
Simon, S.  
National Cancer Institute, National Institutes of Health

4:15 PM  WPM-B.6  
Photochemical Internalization Enhanced Delivery of Bleomycin in Rat Glioma Cells  
Kharkhuu, K., Paulissen, S., Hirschberg, H., Madsen, S.  
University of Nevada, Las Vegas, University of California, Irvine
### WPM-C: Emergency Response Instrumentation

**Chair:** Ken Krieger

2:30 PM **WPM-C.1**  
**Evaluation of Three Portal Monitors for the Screening of the General Public: Advantages and Disadvantages**  
*Kramer, G., Hauck, B., Capello, K.*  
*Health Canada*

2:45 PM **WPM-C.2**  
**The United States Department of Energy’s Aerial Measurement System**  
*Marianno, C.M., Hendricks, T.J.*  
*Remote Sensing Laboratory*

3:00 PM **WPM-C.3**  
**Using Handheld Detectors to Assess Internal Dose After a Radiological Dispersion Device**  
*LoBracco, C., Hutchinson, J., Hertel, N.*  
*Georgia Tech*

3:15 PM **WPM-C.4**  
**Developing a Rapid Screening Method for 90Sr Contamination in Urine**  
*Crawford, E., LaRosa, J., Johnson, T.*  
*Colorado State University, National Institute of Standards and Technology, Gaithersburg, CSU*

3:30 PM **BREAK**

4:00 PM **WPM-C.5**  
**Detector Measurement-to-Activity Conversion Coefficients for First Responders and First Receivers to a Radiological Dispersion Event using Stylized and Tomographic Models**  
*Hurtado, J., Ambrose, R., Lee, C., Bolch, W.*  
*University of Florida*

4:15 PM **WPM-C.6**  
**Training Emergency Responders to Use a Colorimetric Dosimeter**  
*Desrosiers, A., Lewis, D.*  

4:30 PM **WPM-C.7**  
**Potential Use of Personal Portable Electronic Devices for Retrospective Dosimetry Following a Large Neutron Exposure**  
*Simpson, D., Schwarz, D., Popp, D., McDonald, D.*  
*Bloomsburg University, Penn State University*

4:45 PM **WPM-C.8**  
**Explosives Detection Using Fast Neutrons**  
*Lehner, A., Whetstone, Z., Zak, T., Kearfott, K.*  
*University of Michigan, Ann Arbor*

### WPM-D: Radiation Safety Without Borders

**Co-Chairs:** Amir Mohagheshi and Howard Dickson

2:45 PM **WPM-D.1**  
**History of Radiation Safety Without Borders Program**  
*Dickson, H.*  
*EG&G*

3:00 PM **WPM-D.2**  
**Radiation Safety Standards in Developing Countries: Latin American and the Caribbean Experiences.**  
*Borras, C.*  
*Washington, DC*

3:15 PM **WPM-D.3**  
**The South Texas Chapter’s Radiation Safety Without Border’s Visit to Costa Rica**  
*Emery, R., Felknor, S.*  
*University of Texas, Houston*

3:30 PM **WPM-D.4**  
**Insight into Nuclear Science and Technology Programs in Latin America**  
*Lopez, J.A., Puig, D.E.*  
*University of Texas Southwestern Medical Center - Dallas, Asociacion Uruguay de RadioProteccion*

3:45 PM **BREAK**

4:00 PM **WPM-D.5**  
**International Outreach Opportunities**  
*Gilley, D.*  
*Florida State Department of Health*

4:15 PM **WPM-D.6**  
**Helping African Countries Find Solutions for Radioactive Wastes**  
*Robertson, G.*  
*Washington State Department of Health*

4:30 PM **WPM-D.7**  
**Appraisal of the Radiation Authority in Viet Nam**  
*Wainhouse, L.*  
*Washington State Department of Health*

### CRSO Sessions 1 and 2

See the CRSO website www.crso.org for updated information.
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<tr>
<td>2:30-5:00 PM</td>
<td>B119</td>
<td>Radioactive Air - NESHAPs Meeting&lt;br&gt;Co-Chairs: Gustavo Vasquez and Matthew Barnett</td>
</tr>
<tr>
<td>2:30-5:00 PM</td>
<td>B117/118</td>
<td>Movies</td>
</tr>
<tr>
<td>5:30-6:30 PM</td>
<td>A106</td>
<td>HPS Business Meeting</td>
</tr>
<tr>
<td>6:00-8:00 PM</td>
<td>Room: DoubleTree Hotel</td>
<td><strong>WPM-E: ADJUNCT TECHNICAL SESSION</strong>&lt;br&gt;Aerosol Measurements&lt;br&gt;Chair: Morgan Cox</td>
</tr>
<tr>
<td>6:00 PM</td>
<td></td>
<td>WPM-E.1 Conversion from Physical to Aerodynamic Diameters for Radioactive Aerosols&lt;br&gt;Whicker, J.&lt;br&gt;<em>Los Alamos National Laboratory</em></td>
</tr>
<tr>
<td>6:15 PM</td>
<td></td>
<td>WPM-E.2 Operational Experience with the Alpha 7L CAM in a Plutonium Facility&lt;br&gt;Wannigman, D.L.&lt;br&gt;<em>Los Alamos National Laboratory</em></td>
</tr>
<tr>
<td>6:30 PM</td>
<td></td>
<td>WPM-E.3 The Canberra iSolo; Can it Accurately Measure Transuranic (TRU) Activity in Air Filters?&lt;br&gt;Hayes, R.&lt;br&gt;<em>National Security Technologies</em></td>
</tr>
<tr>
<td>6:45 PM</td>
<td></td>
<td>WPM-E.4 Numerical Computation of Particle Collision Rates in Disparate Flow Regimes&lt;br&gt;Sajo, E.&lt;br&gt;<em>Louisiana State University</em></td>
</tr>
<tr>
<td>7:00 PM</td>
<td></td>
<td>WPM-E.5 A View of the Two New Comprehensive International Electrotechnical Commission (IEC) Standards for Noble Gas Monitoring and for Tritium Monitoring&lt;br&gt;Cox, M.&lt;br&gt;<em>NIST/DHS</em></td>
</tr>
<tr>
<td>7:15 PM</td>
<td></td>
<td>WPM-E.6 Comparison of Alpha Particle and Gamma Ray Spectra using Various Radiation Detector Types for Radon and Thoron Progeny in the Presence of Transuranic Radionuclides&lt;br&gt;Voss, J.T.&lt;br&gt;<em>Los Alamos National Laboratory</em></td>
</tr>
<tr>
<td>7:30 PM</td>
<td></td>
<td>WPM-E.7 The Status of American National Standards Institute (ANSI) and IEC Standards for Air Sampling and Monitoring&lt;br&gt;Cox, M.&lt;br&gt;<em>NIST/DHS</em></td>
</tr>
<tr>
<td>7:45 PM</td>
<td></td>
<td>WPM-E.8 A Review of the New Textbook on Radioactive Air Sampling&lt;br&gt;Maiello, M.&lt;br&gt;<em>Wyeth Research Lab</em></td>
</tr>
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</table>
THURSDAY

7:00-8:00 AM A105
CEL7 Training First Responders on Radiological Dispersal Devices (RRDs) and Improvised Nuclear Devices (INDs)
K.L. “Ken” Groves
S2-Sevorg Services, LLC

7:00-8:00 AM A106
CEL8 Subsurface Soil DCGLs
Jeffrey Lively
MACTEC

8:30 AM-NOON A105
THAM-A: Current Topics in Internal Dose Assessment Special Session
Co-Chairs: Ray Guilmette and Keith Eckerman

8:30 AM THAM-A.1
Are All Internal Dose Assessments Created Equally?
Guilmette, R.
Los Alamos National Laboratory

8:45 AM THAM-A.2
Dosimetric Quantities and Concepts of Radiation Protection:
Eckerman, K.
Oak Ridge National Laboratory

9:15 AM THAM-A.3
Assessment of Individual Doses for Use in Epidemiological Studies
Bouville, A., Simon, S.
National Cancer Institute, National Institutes of Health

9:45 AM BREAK

10:00 AM THAM-A.4
Dose Assessment for Pu Workers at the Mayak Production Association
Romanov, S.
Southern Urals Biophysics Institute, Russia

10:30 AM THAM-A.5
Challenges and Potential Solutions for Patient Specific Dose Reconstruction in Diagnostic and Therapeutic Medical Exposures
Boch, W.E.
University of Florida

11:00 AM THAM-A.6
Occupational Internal Dosimetry
LaBone, T. R.
MJW Corporation

11:30 AM THAM-A.7
Dose Reconstruction for Compensation Programs
Toohey, R.
Oak Ridge Associated Universities

8:30 AM-NOON A106
THAM-B: 10 CFR 835 Roundtable Session
Co-Chairs: Scott Schwahn, Peter O’Connell and Robert Loesch

On August 10, 2006, the Department of Energy (DOE) announced that it was proposing changes in Title 10, Code of Federal Regulations, Part 835. Among other changes, fundamental changes in dosimetry have been proposed. The proposed revision updates the dosimetric models and dose terms to be consistent with newer recommendations from the International Commission on Radiological Protection (ICRP), including use of updated tissue and radiation weighting factors and updated derived air concentration Values. At many DOE facilities, these changes will require considerable effort. Aside from the direct impact on DOE facilities, there are questions about how these changes will impact other programs such as the Department of Energy Laboratory Accreditation Program (DOELAP), consensus standards groups, and calibration laboratories. This panel discussion is intended to provide a forum for participants to ask questions, understand how these changes may impact their facilities, and to share methods that will be used to implement the changes. Department of Energy representatives will be present to assist in the discussion.

It should be recognized that as of the time of this abstract, the revision to 10 CFR 835 was only proposed. By the time of the meeting, the rule may be finalized.

8:30 AM-NOON B110-112
THAM-C: Operational Health Physics
Co-Chairs: Tara Medich and Jeff Whicker

8:30 AM THAM-C.1
Distance Continuing Education On-line: Experiences of the Colorado State University Student Chapter of Health Physics Society
Elder, D., Johnson, T.
Colorado State University, Colorado State University

8:45 AM THAM-C.2
Records Management: Bridging the Gap between Operational Health Physics and Dose Reconstruction
Green, S., Kleinhans, K.
Bechtel Jacobs Co. LLC

9:00 AM THAM-C.3
Dose Reduction in a Positron Emission Tomography Chemistry Laboratory
Brunette, J., Jacobson, M.
Mayo Clinic

9:15 AM THAM-C.4
Decontamination of a Fume Hood Contaminated with Tritiated Thymidine
Walter, K.J., Johnson, T.E.
Colorado State University
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:45 AM</td>
<td>THAM-C.6</td>
<td>Aerosol Distribution Inside the Object Shelter: Present Day Data, Questions and Explanations.&lt;br&gt;Aryasov, P., Nechaev, S., Tsygankov, N., Dmitrienko, A.&lt;br&gt;Radiation Protection Institute of Ukraine, State Enterprise Chernobyl Nuclear Power Plant</td>
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<tr>
<td>10:00 AM</td>
<td>BREAK</td>
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<tr>
<td>10:30 AM</td>
<td>THAM-C.7</td>
<td>Estimating the Airborne Contamination Hazard using a Hand-Held Instrument&lt;br&gt;Duran, M., Fanning, M.&lt;br&gt;Los Alamos National Laboratory</td>
</tr>
<tr>
<td>10:45 AM</td>
<td>THAM-C.8</td>
<td>The Next Generation Air Particle Detectors for the United States Navy&lt;br&gt;Hayes, R., Marianno, C.&lt;br&gt;NSTec</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>THAM-C.9</td>
<td>Sampling and Monitoring Releases of Airborne Radioactivity in the Workplace of Nuclear Facilities: Status of ANSI N13.56&lt;br&gt;Whicker, J., Hoover, M.&lt;br&gt;Los Alamos National Laboratory, National Institute for Occupational Safety and Health</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>THAM-C.11</td>
<td>Alpha Attenuation Due to Dust Loading&lt;br&gt;Dailey, A.&lt;br&gt;Francis Marion University, Savannah River Site</td>
</tr>
<tr>
<td>11:45 AM</td>
<td>THAM-C.12</td>
<td>Can Analysis of Bremsstrahlung Energies Help Identify Low-Energy Beta Emitting Radionuclides?&lt;br&gt;Williams, V., Krampert, J., Cook, A.&lt;br&gt;Merck &amp; Co., Inc.</td>
</tr>
<tr>
<td>3:30-9:45 AM</td>
<td>B113-114</td>
<td>THAM-D: Emergency Response&lt;br&gt;Chair: Brooke Buddemeier</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>THAM-D.1</td>
<td>State Radiation Control Program Preparedness and Response to a Natural Disaster&lt;br&gt;Lanza, J., Williamson, J., Goff, R.&lt;br&gt;Florida Department of Health, Mississippi Division of Radiological Health</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>THAM-D.2</td>
<td>US NRC Protective Action Recommendation Study&lt;br&gt;Sullivan, R.&lt;br&gt;US Nuclear Regulatory Commission</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>THAM-D.3</td>
<td>Evacuations in the Post-Katrina World&lt;br&gt;Milligan, P., Jones, J.&lt;br&gt;US Nuclear Regulatory Commission, Sandia National Labs</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>THAM-D.4</td>
<td>Disaster Preparedness and Recovery for R&amp;D Facilities&lt;br&gt;Norton, M.&lt;br&gt;Philotechnics Ltd.</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>THAM-D.5</td>
<td>Response to Cesium-137 Contamination of a Steel Mill&lt;br&gt;Cherry, R., Flynn, C., Krieger, K., Stuckey, W.&lt;br&gt;Earth Tech, Private Consultant, LeTourneau Steel Group</td>
</tr>
<tr>
<td>3:30 AM-NOON</td>
<td>B115-116</td>
<td>THAM-E: Instrumentation&lt;br&gt;Co-Chairs: Ian Hamilton and Eric Fruchtnicht</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>THAM-E.1</td>
<td>A Three Exposure, High Energy Neutron Spectrometer&lt;br&gt;Burgett, E., Shannon, M.*, Hertel, N., Howell, R.&lt;br&gt;Georgia Institute of Technology, Emory University School of Medicine</td>
</tr>
<tr>
<td>8:45 AM</td>
<td>THAM-E.2</td>
<td>Back to the Basic: Conversion of 4-20 mA Analog Current Signals to the Information of Interest in Log Scale Range&lt;br&gt;Chiou, H.&lt;br&gt;Washington TRU Solutions, LLC</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>THAM-E.3</td>
<td>Proof of Concept for a Digital Phoswich Spectrometer&lt;br&gt;Farsoni, A., Hamby, D.&lt;br&gt;Oregon State University</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>THAM-E.4</td>
<td>Calibration of a Charcoal Canister-Based Radon Screening System Using a Small Radon Chamber&lt;br&gt;Cooper, D.E., Harvey, J., Lehnert, A., Kearfott, K.*&lt;br&gt;University of Michigan</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>THAM-E.5</td>
<td>Comparison of MCNP and RADSAT for Detector Simulation&lt;br&gt;McConn Jr, R., Pagh, R., Smith, L.&lt;br&gt;Pacific Northwest National Laboratory</td>
</tr>
</tbody>
</table>
THURSDAY

9:45 AM THAM-E.6
Comparison of Measured Counting Efficiencies for Carbon-14, Strontium-89, Strontium-90, and Yttrium-90 with Estimates from a Monte Carlo Model
Nichols, M., Kahn, B.
Georgia Power Environmental Lab, Georgia Tech Research Institute

10:00 AM THAM-E.7
Application of Direct Dose Detection Technology to Health Physics
Oswald, R., Hodgson, R.
Radiation Detection Company, Inc., Radiation Watch, Ltd.

10:15 AM BREAK

10:45 AM THAM-E.8
Radiation Safety Aspects of the Neutron Sources Replacement for the Fissile Mass Flow Monitor
Radev, R., Uckan, T., March-Leuba, J., Powell, D., Nelson, D.
Lawrence Livermore National Laboratory, Oak Ridge National Laboratory, Sandia National Laboratory

11:00 AM THAM-E.9
A “Litmus Paper” Dosimeter
Savignac, N., Gomez, L., Warner, B.
RLP Dosimetry, Caldera Pharmaceuticals

11:15 AM THAM-E.10
Characterization of Various In Situ Object Counting System Apertures
Wagoner, D.A.
Francis Marion University

11:30 AM THAM-E.11
Development and Testing of a Lanthanum Bromide Portable Field Gamma-ray Spectrometer
Giles, J., Oertel, C., Roybal, L.
Idaho National Laboratory

11:45 AM THAM-E.12
The Study of High Dose 10MeV Electrons Response of CaSO4:Dy as Thermoluminescence Dosimeter
Moini, A.R., Gheisari, D., Mirjalili, G., Gholampoor, M., Esmaili, J.
Yazd University, Iran, Atomic Energy Organization of Iran, University of Technology, Iran

8:30 AM-NOON A103 and A104

CRSO Sessions 3 and 4
Health physicists are experts in radiation protection, and are frequently one of the people consulted when radioactive materials are encountered in homeland security situations. While a health physicist is well versed in many aspects of radiation protection, they may not be fully aware of the function and functioning of the many types of radiation detection and identification equipment being used in homeland security applications. The use of radiation detection equipment will continue to expand as the concern about radiological or nuclear terrorism continues.

This session will describe various types of equipment used such as: pager-type devices, portal monitors, search instruments, and radioisotope identifiers. The session will also address their function, application, mandated sensitivities, and limitations.

AAHP 1  Eight-hour OSHA Hazardous Waste Operations Refresher Training
Jan Johnson, Tetra Tech
Judson Kenoyer, Dade Moeller & Associates

The objective for this course is to provide annual refresher training, as described in 29 CFR 1910.120 (e), for workers who may be exposed to hazardous substances, health hazards, or safety hazards associated with hazardous waste operations. A certificate will be awarded to document compliance with the refresher training requirement. After completing the course, attendees will be able to describe the regulations, guidance, and resource materials related to occupational health and safety for hazardous waste operations and will be familiar with chemical, physical, biological, and ergonomic hazards and their mitigation. In addition, hazardous chemical monitoring methods, use of personal protective equipment, and medical surveillance requirements will be discussed. The class will provide participants the opportunity to discuss specific problems in an interactive group setting with fellow professionals in radiation and occupational health and safety.

AAHP 2  Emergency Dose Assessment
Steven F. LaVie, Randolph L. Sullivan, Patricia A. Milligan
US NRC Office of Nuclear Security and Incident Response

When a radiological emergency occurs at a nuclear power plant, critical decisions may be necessary concerning protective actions for persons on the plant site and for the public beyond the site boundary. These decisions are based on assessments of the potential offsite consequences of the radiological emergency. Nuclear power plants have systems and equipment for assessing and monitoring plant systems and effluent releases to the environment. These plants have developed methods and procedures for equating plant and effluent parameter data to the magnitude of release of radioactive materials to the environment. The plant’s emergency response organization includes personnel qualified in performing these monitoring and assessments.

This session addresses one of the more significant accident assessments’ functions: the assessment of the projected doses to people onsite and offsite due to released of radioactive material to the environment caused by the radiological emergency. Although these assessments are often referred to as dose assessments or dose projections, they are generally based in part on other accident assessments such as core damage estimates. Reduced to its fundamentals, a dose assessment (1) quantifies or estimates the types, forms, and magnitude of the radioactive materials released, (2) estimates the dispersion of these materials through the environment following release, and (3) estimates the dose to downwind receptors from the materials transported to their location. This session will provide an overview or review into the process of performing dose assessments.

AAHP 3  Homeland Security Instrumentation for the Health Physicist
Brian Rees
Los Alamos National Laboratory

Health physicists are experts in radiation protection, and are frequently one of the people consulted when radioactive materials are encountered in homeland security situations. While a health physicist is well versed in many aspects of radiation protection, they may not be fully aware of the function and functioning of the many types of radiation detection and identification equipment being used in homeland security applications. The use of radiation detection equipment will continue to expand as the concern about radiological or nuclear terrorism continues.

This session will describe various types of equipment used such as: pager-type devices, portal monitors, search instruments, and radioisotope identifiers. The session will also address their function, application, mandated sensitivities, and limitations.
The Professional Enrichment Program (PEP) provides a continuing education opportunity for those attending the Health Physics Society Annual Meeting. The two hours allotted each course ensure that the subjects can be discussed in greater depth than is possible in the shorter programs offered elsewhere in the meeting.

On Sunday, July 8, a series of 24 courses will be offered between 8:00 am - 4:00 pm.

In addition to the above-mentioned sessions for Sunday, five PEP lectures are scheduled on Monday, Tuesday, and Wednesday afternoons from 12:15 - 2:15 pm.

Registration for each two-hour course is $60 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the pre-registration deadline will be sent confirmation of their PEP course registration.

Students with a current ID card will be admitted free of charge to any sessions which still have space available after the waiting list has been admitted. Student admission will be on a first-come, first-served basis and will only begin 15 minutes after the start of the session to allow for completion of ticket processing.

Please Note!!

Please be on time for your sessions. The lecturer will begin promptly at the scheduled time. Please allow time for check-in. The HPS reserves the right to schedule a substitute speaker or cancel a session in case the scheduled speaker is unavailable.

Attendees not present at the starting time of the session cannot be guaranteed a space, as empty spaces will be filled from the wait list at that time. Spaces left after the wait list has been admitted may be filled with students. If your duties at the meeting cause you to be late for your lecture (e.g., chairing a session), contact the PEP registration desk so that your name can be placed on the waiver list and your space held.

Refund policy

Requests for PEP refunds will be honored if received in writing by June 8. All refunds will be issued AFTER the meeting. Exceptions will be handled on a case by case basis.

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**PEP 1A Identification and Control of Electromagnetic Fields (0 - 300 GHz) (Part 1 of 3)**

*John Leonowich*

*University of Nevada Las Vegas*

For over a hundred years there has been a marked development and increased utilization of equipment and devices for industrial, scientific, medical, telecommunications, and military applications that emit one or more types of non-ionizing radiant energy in the microwave (MW), radiofrequency (RF) and extremely low frequency (ELF) portions of the electromagnetic spectrum (i.e., 0 - 300 GHz). At the same time, there has been a growing concern in government agencies, industry, and professional societies as well as among the public regarding the possible health hazards associated with the development, manufacture, and operation of devices that emit electromagnetic radiant energy in this frequency range. To address these concerns, private scientific organizations and government agencies have developed exposure guidance and consensus standards to protect workers and the public against possible hazards. This course will review safety issues associated with this extremely broad portion of the electromagnetic spectrum, which covers everything from “batteries” to “heat lamps”, or “DC to daylight”.

These fields are alleged to have a number of long term health effects, most notably cancer. The present controversy surrounding wireless communications, low frequency fields, and new non-lethal weapons technology will be explored. Exposure criteria of the Institute of Electrical and Electronic Engineers (ANSI/IEEE-2006), the American Conference of Governmental Industrial Hygienists (ACGIH), as well as the International Commission for Non-ionizing Radiation (ICNIRP) will be reviewed. There will be extensive discussion on how to establish appropriate control measures based on calculations and field measurements. At the end of this PEP, the student will understand the proven health risks associated with these fields and will be able to explain risks to the concerned layman. Case studies will be presented to aid in the understanding of the actual risks of exposure to these fields. Multimedia presentations, class discussions, and equipment demonstrations will be used to present the material.

**PEP 1B Medical Internal Dose Calculations – Current Methods and Tools**

*Mike Stabin*

*Vanderbilt University*

Methods for performing internal dose calculations in medical applications are undergoing rapid change. Traditional mathematical model-based internal dose calculations are being replaced with significantly more realistic standardized models, and patient-specific dose calculations, principally for therapy applications, are coming of age. Calculation of internal dose estimates from animal or human data sets requires knowledge of a number of important principles and relationships in kinetic analysis and dose assessment, and knowledgeable use of available software tools. Adjustments to traditional dose calculations based on patient-specific measurements are routinely needed, especially in therapy calculations, for marrow activity (based on measured blood parameters), organ mass (based on volumes measured by ultrasound or Computed Tomography (CT)), and other variables. More data and resources are becoming available through the internet, and the power and speed of available tools is increasing rapidly. This program will give an overview of current tools and common practice in internal dose assessment in nuclear medicine, with practical examples worked out in several important areas of application. A brief discussion will be included of current issues in radiation biology that are pertinent to the interpretation of calculated dose estimates.
PEP 1C  Neutron Dosimetry  
Joe McDonald  
Pacific Northwest National Laboratory (Emeritus Laboratory Fellow)  
The determination of dose equivalent in neutron fields is complex, but necessary, in a number of working environments. Neutrons represent a radiological hazard in nuclear power plants, accelerator facilities, source fabrication facilities, the transportation and storage of nuclear waste, reprocessing of nuclear fuel and nuclear physics research.

Neutrons are not generally considered to be an environmental radiation protection problem, but aircrew and astronauts are exposed to the cosmic neutron flux.

Neutron dosimetry is more complex than photon (gamma-ray, x-ray and bremsstrahlung) dosimetry. The reasons for this increased complexity include: the wide range of neutron energies encountered in workplaces such as nuclear power reactors and high energy research accelerators. The neutron energies can extend over more than ten orders of magnitude. Neutrons are nearly always accompanied by photons, therefore some method for separately determining the effects of these two radiations may be needed. The interactions of neutrons with materials used as detectors are complex because of the nature of the neutron cross sections in various elements. In addition, the elements in the materials used to fabricate neutron detectors and dosimeters are nearly always significantly different from the elements present in biological tissues. This complication requires the use of conversion coefficients to determine the dose equivalent in tissue, and it explains why there are no perfect neutron dosimeters. Nevertheless, there are many useful, practical and accurate neutron dosimeters and area survey instruments that can be used in various situations to measure quantities appropriate for determining neutron dose equivalent or dose equivalent rate.

The accurate determination of ambient and personal dose equivalents in neutron fields requires the proper use of appropriate radiological quantities and units, knowledge of the dose equivalent response of the personal dosimeters and area survey meters employed, measurement or calculation of the fluence spectrum in the workplace and the fluence spectrum of the reference radiation used to calibrate the survey instruments and personal dosimeters. This PEP class will present information on the physical and dosimetric properties of neutrons, quantities and units, conversion coefficients, sources of neutrons, neutron instruments and dosimeters, and calibration procedures.
understanding of the areas now aligned with the radiation safety function. This situation is unfortunate because when armed with a basic understanding of the other safety programs, the radiation safety staff can provide improved customer service and address many simple issues before they become major problems. This unique Professional Enrichment Program (PEP) series is designed to address this shortcoming by providing an overview of a number of key aspects of EH&S programs, from the perspective of practicing radiation safety professionals who now are involved in a broader set of health and safety issues. The PEP series will consist of three 2 hour segments:

* Part 1 will address the “Basics of Fire & Life Safety” and “Risk Management & Insurance”. Included in the fire & life safety segment will be a discussion on the basic elements of the life safety code and the fire detection and suppression systems. The requirements for means of egress will also be discussed. The risk management & insurance portion of the session will address the issues of retrained risks (those which are not covered by insurance) and transferred risks (those covered by a financial vehicle), and how these aspects impact EH&S operations.

* Part 2 will examine the “Basics of Biological & Chemical Safety” and “Security 101 for Radiation Safety Professionals”. During the first part of this session, the classification of infectious agents and the various assigned biosafety levels will be discussed. Aspects of chemical exposures, exposure limits, and monitoring and control strategies will also be discussed. The second part of the session will focus on security as it is applied in hospital and university settings. Various strategies employed to improve security controls will also be presented.

* Part 3 will focus on “Measuring and Displaying Radiation Protection Program Metrics That Matter (to Management)”. Radiation protection programs typically accumulate data and documentation so that regulatory officials can assess compliance with established regulations. The implicit logic associated with this activity is that compliance equates to an acceptable level of safety. But in this era of constrained resources, mere regulatory compliance is no longer sufficient to justify all necessary programmatic resources. Radiation protection programs are now expected to readily demonstrate how they add tangible value to the core missions of an organization. The demonstration of this value is expected to be in the form of some sort of performance metrics, but this is an area in which many radiation safety professionals have not been trained. The issue is further compounded by the need to display the metric information in manners that are but succinct and compelling, yet another area where formal training is often lacking. This session will first describe a variety of possible radiation protection program performance measures and metrics, and then will focus on the display of the information in ways that clearly convey the intended message. Actual before and after data display “make-overs” will be presented and ample time will be provided for questions, answers, and discussion.

Each PEP segment is designed so that participants can take any session individually, although the maximum educational benefit will be derived from the participation in all three sessions. The particular topics included in the PEP series have been consistently identified as extraordinarily useful to participants in the highly successful week-long “University of Texas EH&S Academy”. Ample time will be allotted for questions answers and discussion, and each segment will be supplemented with key reference information.

PEP 1F  ON ALERT: Post 9/11 Integrated Emergency Planning
Lawrence T. Dauer
Memorial Sloan-Kettering Cancer Center

In the post 9/11 period, there has been a coordinated country-wide effort to improve response systems and to develop the prevention, preparedness, recovery, and mitigation capabilities of Federal, State, local, private-sector, and non-governmental organizations. A National Incident Management System has been developed to encourage all parties to work together effectively and efficiently to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity, including acts of catastrophic terrorism. Historically, health physics and radiation safety staffs have played central roles in individual site, local community, and state/national emergency response planning and events.

This PEP will present an overview of the current integrated emergency planning processes. It is the intent of the course to provide the radiation safety officer or radiation safety professional with tools necessary to respond to all emergencies within the current incident response framework. This PEP will include both didactic and interactive elements. The following topics will be covered:

1) What would I do if? (workshop/drill);
2) What’s so bad about that? (hazard vulnerability and assessment);
3) Knowledge itself is power (chemical, biological, radiological, nuclear, and explosion facts)
4) Hiking up the chain of command (incident command systems)
5) I love it when a plan comes together (practical emergency planning and administration tips)
6) It is all people stuff (the psychology of disaster).

PEP 1G Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual (MARSAME): Overview and Current Status
Carl Gogolak
Consultant

The Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME) is a supplement to the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM). Like MARSSIM, MARSAME is a joint effort by the Department of Defense (DOD), Department of Energy (DOE), Environmental Protection Agency (EPA), and Nuclear Regulatory Commission (NRC). A workshop on the draft MARSAME manual was conducted at the HPS midyear meeting in Knoxville just as the document was being released for public comment.

MARSAME provides technical information on approaches for planning, implementing, assessing, and
documenting surveys to determine proper disposition of material and Equipment (M&E). Examples of M&E include metals, concrete, tools, equipment, piping, conduit, furniture, and dispersible bulk materials such as trash, rubble, roofing materials, and sludge. Liquids, gases, and solids stored in containers (e.g., drums of liquid, pressurized gas cylinders, containerized soil) are also included in the scope of this document. Release (including clearance) and interdiction are types of disposition options in MARSAME.

The purpose of this supplement is to provide information for the design and implementation of technically defensible surveys for disposition of M&E. MARSAME provides information on selecting and properly applying disposition survey strategies and selecting measurement methods. The data quality objectives (DQO) process is used for selecting the best disposition survey design based on the selected disposition option, action level, description of the M&E (e.g., size, accessibility, component materials), and description of the radioactivity (e.g., radionuclides, types of radiation, surficial versus volumetric activity). Detailed information on the DQO Process can be found in EPA QA/G-4 (EPA 2006a), MARSSIM Appendix D, and MAR-LAP Appendix B. This supplement describes a number of different approaches for performing technically defensible disposition surveys and provides information for optimizing survey designs.

Disposition surveys may be performed as a single event or as part of a routine process. Single event disposition surveys are usually performed once in association with a specific project. Surveying a backhoe at the completion of a decommissioning project is one example of a single event disposition survey. Routine process disposition surveys are usually associated with ongoing tasks where similar surveys are performed repeatedly. One example of a routine process disposition survey would be a radiological survey of tools prior to removal from a controlled area at a nuclear facility. Both single event and routine process types of surveys are included in the scope of MARSAME.

Case studies highlight the MARSAME graded approach including Initial Assessment, Inputs to the Decision Rule, Survey Design, Survey Implementation, and Survey Results Assessment.

### PEP 1H  Medical Health Physics Refresher

**Mike Charlton**  
**University of Texas Health Science Center at San Antonio**

The dynamic medical health physics setting mandates continual review of current practices. The medical health physics environment has drastically changed over the recent past with new applications, new imaging modalities, and a new regulatory structure. This continual evolution makes it challenging for the practicing medical health physicist to remain abreast of current issues. This continuing education session will review recent regulatory changes, highlight commonly observed radiation-producing device deficiencies, review a typical PET/CT shielding problem, and discuss recent medical irradiator security issues. Ideas for improving medical health physics procedures focusing on training, example shielding calculations, medical health physics safety surveys, and commonly observed medical health physics issues are provided. Attendees will have the opportunity to ask medical health physics questions and exchange key successes that worked in their environment with the speaker.

Medical Health Physics Refresher:
1. The University of Texas Health Science Center at San Antonio maintains the only medical health physics graduate program in Texas. This novel program emphasizes the tangible relationship between physicians, medical physicists, and health physicist in the conduct of medicine.
2. This refresher course was developing through lectures given to assist health physics students and radiology residents prepare for national board examinations.
3. Dr. Charlton was awarded the 2006 Teacher of the Year Award in UTHSCSA Radiology and the first non-clinician to receive the award in more than a decade.

**SUNDAY - 10:30 AM-12:30 PM**

### PEP 2A Non-ionizing Radiation: An Overview of Incoherent Non-ionizing Radiation Hazards (Part 2 of 3)

**Tom Johnson**  
**Colorado State University**

Incoherent non-ionizing radiation (NIR) hazards can be encountered by health physicists, but are not typically addressed in any formal education program. This course will provide a basic overview of incoherent NIR hazards. Examples of some common situations will be provided and discussed. Course attendees will learn the basic terminology and nomenclature, spectral region designations, regulatory framework, biological effects and consensus guidance. The recommended exposure limits for this type of NIR will be a key part of the class. After completing this course, attendees will be conversant in which standards apply for some different types of sources, and specific hazards associated with incoherent NIR.

While some knowledge of NIR may be helpful, both experienced and novice health physicists with safety interests or responsibilities in this area will benefit from this course.

### PEP 2B RDD/IND Awareness Training for First Responders

**Ken Groves**  
**DOE-National Nuclear Security Administration**

This class will familiarize the health physicist with issues that are discussed with First Responders (fire fighters, EMTs, HAZMAT and Law Enforcement personnel) who need a basic concept of how to effectively respond to a Radiological Dispersal Device (RDD) or an Improvised Nuclear Device (IND) incident. This training is normally taught in a four-hour four-module training session by Department of Energy (DOE) Radiological Assistance Program (RAP) health physicists in DOE RAP Region 4 (AZ, NM, TX OK & KS).

In this PEP session you will get a copy of the PowerPoint presentation used for the DOE RAP Region 4 Training and background on how over the last 3 years this
training has been useful in training First Responders in DOE RAP Region 4. Additional radiological emergency training material will be discussed and made available to the PEP students.

PEP 2C Advances in Customized Phantoms and Organ Models for Medical Dosimetry Studies – Stylized to Voxel to Hybrid

Wesley Bolch
University of Florida

In this presentation, we will explore past, present, and future modeling techniques needed for customized estimates of radiation organ dose to medical patients. In their 2005 report, the BEIR VII committee recommends that future studies on radiation risks should give priority to prospective assessments and medical follow up of patients, particularly children, undergoing present-day high-dose fluoroscopy and CT imaging. Such studies would ideally benefit from computational phantoms of the patient that can be customized to their unique internal anatomy and body morphometry, without reliance on reference phantoms as is current practice. We will discuss specific and customized dose models for the radiosensitive tissues of the skeleton, and follow with the movement away from equation-based anatomic phantoms to more anatomically realistic voxel-based phantoms. Finally, the concept of a hybrid phantom is introduced which provides for the anatomic realism of a voxel phantom, while retaining the modeling flexibility of an equation-based phantom. During the present, methods for assessing patient doses in diagnostic radiology, interventional cardiac fluoroscopy, and computed tomography will be discussed and reviewed.

PEP 2D Fundamentals of Radiation Risk Communication for Health Physicists, Dealing with the Public (Part 1 of 2)

Ray Johnson
Radiation Safety Academy

A poll of over 1,400 HPS members during my President-elect visits showed that by far the greatest concerns of the Society are for the difficulties in public understanding of radiation issues. Public fears, based on misperceptions of radiation risks, are causing wasted manpower and financial resources on trivial risks. We seem to be losing ground in our efforts to help people understand radiation. Is there any hope? My answer is YES, absolutely. HPs are successful because of the many tools they can apply to solving problems. But, what tools do we have to apply to communication and people issues that are often the greatest day-to-day challenge? HPs can learn a few simple tools to become more effective communicators on issues of radiation risks. We will review and practice several fundamental tools available from the fields of psychology, behavioral, and communication sciences for practical help in dealing with public understanding of radiation. Many of these tools have been presented in monthly columns in the HPS Newsletter “Insights in Communication” from 1994 to 2001. A complete set of these articles will be provided. Attendees are requested to bring to the session at least three communication scenarios that you would like to address in the class.


Robert Emery, Bruce Brown and Michael Charlton
The University of Texas Health Science Center at San Antonio

See description of PEP 1E for overview all of the 3 courses.

Part 2 will examine the “Basics of Biological & Chemical Safety” and “Security 101 for Radiation Safety Professionals”. During the first part of this session, the classification of infectious agents and the various assigned biosafety levels will be discussed. Aspects of chemical exposures, exposure limits, and monitoring and control strategies will also be discussed. The second part of the session will focus on security as it is applied in hospital and university settings. Various strategies employed to improve security controls will also be presented.

Each PEP segment is designed so that participants can take any session individually, although the maximum educational benefit will be derived from the participation in all three sessions. The particular topics included in the PEP series have been consistently identified as extraordinarily useful to participants in the highly successful week-long “University of Texas EH&S Academy”. Ample time will be allotted for questions answers and discussion, and each segment will be supplemented with key reference information.

PEP 2F Health Physics Aspects of Depleted Uranium (DU)

Ronald L. Kathren
Washington State University at Tri-Cities, Richland

Interest in potential health effects of depleted uranium has intensified because of its use in munitions in the two Gulf Wars and in Kosovo, which have introduced large quantities into the environment, and reports of a so-called Gulf War Syndrome attributable to exposure to DU. This PEP course will brief cover the production, uses, chemistry and radiological properties of DU; biokinetics (including route of entry), distribution and excretion within the body; acute and chronic chemical toxicity and radiological effects; bioassay and evaluation and assessment of intakes and internal exposures; and epidemiology.

PEP 2G Occupational Internal Dosimetry Calculations (Part 1 of 2)

Tom LaBone
MJW Corporation

Participants interested in this presentation should register for both Parts 1 and 2.

In this four-hour PEP we will explore the systems of models, approximations, assumptions, and numerical calculations that are essential to the practice of internal dosimetry in an occupational setting. Emphasis will be placed on performing the calculations in class and providing enough information to allow the sufficiently motivated student to do the same at home.
Perhaps the most fundamental type of calculation is the dose to organs and tissues from a given intake of radioactive material. The three dosimetric schemas in common use today are those of ICRP 30 (and associated publications), ICRP 30 as modified in Federal Guidance Report 11, and ICRP 65 (and associated publications, especially ICRP 66). The dose from an intake of Co-60 will be calculated from first principles using Mathcad and the open-source language R. These results will then be compared to the output of the specialized computer codes CINDY, IMBA, and DCAL.

The next type of calculation is to predict the content of a “bioassay compartment.” A bioassay compartment is the combination of compartments from the biokinetic model that correspond to what we think a radiobioassay is measuring. The content of the bioassay compartment at a given time is commonly referred to as an “intake retention fraction.” As an example, the intake retention fractions for Co-60 will be calculated using Mathcad and R. These results will then be compared to the output of CINDY and IMBA and the tabulations of NUREG/CR-4884 and Potter.

The final type of calculation we will cover is the use of the intake retention fractions and the observed bioassay data to estimate the intake. Although not mathematically complex, this must be considered to be the most interesting of all internal dose calculations because of the high degree of professional judgment often required. Bioassay data for Co-60 will be evaluated using Mathcad and R. These results will then be compared to the output of CINDY and IMBA.

PEP 2H Review of IATA Requirements for Air Transportation of Radioactive Material
Sean M. Austin
Radiation Safety Academy, Inc.

This session will review requirements of the International Air Transport Association (IATA) pertaining to the air transportation of radioactive materials. There have been changes to these requirements pertaining to the preparation of radioactive materials for shipment in excepted packages. We will review IATA requirements for training of HAZMAT employees, classification of hazardous materials, exemptions, normal form and special form radioactive materials, limited quantities of materials, articles and instruments containing a radioactive component, low-specific activity shipments (LSA-I, LSA-II, LSA-III), and surface contaminated objects (SCO-I and SCO-II). We will review requirements for radioactive material packagings, marking and labeling packages, placarding vehicles, and completion of shipping papers. There will be discussion explaining the differences between IATA requirements and the hazardous materials regulations of the U.S. Department of Transportation.
tages of each for specific processing applications. In addition, general economic considerations will be included for comparison among technologies. At the conclusion of the presentation, persons attending the session are expected to have an appreciation for different irradiator designs and how systems may be adapted for specific applications.

Gamma irradiators that meet the definition of Category I (self-contained), II (panoramic, dry source storage), and III (underwater) under the ANSI classification, and accelerator-based irradiators that meet the IAEA definition of Category I (self-contained) will be mentioned incidentally for comparison purposes. Detailed descriptions of the design of such systems will not be included in this PEP.

PEP 3C Instrument Selection, Calibration, and Use for Unrestricted Release

_Ed Walker_

This presentation shall describe issues that must be considered for the detection and evaluation of residual radiation and radioactive material on surfaces of items, on building and land surfaces, and on personnel prior to unconditional release to the public. The discussion will focus on issues associated with portable radiation detection systems only.

Selection of an appropriate detection system must consider the radiation source emissions, source geometries, and measurement protocol, e.g. scan vs. fixed point measurements. The presentation will include examples of the effects of calibration and check source characteristics when applied to the interpretation of field measurements. These effects include source vs. detector geometries, and the physical characteristics of the fabricated source vs. residual field conditions.

The presentation will also include common field practices that impact the interpretation of field measurements using laboratory calibration conditions.

PEP 3D Fundamentals of Radiation Risk

_Communication for Health Physicists, Dealing with Radiation Workers (Part 2 of 2)_

_Ray Johnson_

_Radiation Safety Academy_

While most HPs are well prepared to deal with technical issues for implementing a successful radiation safety program, many are not well prepared for communication or people issues. Few are trained to deal with issues involving feelings, such as an upset worker, an overly alarmed worker, or an overly complacent worker. Do you know how to deal with anger in the workplace or resistance to safety program requirements? How do you motivate safety program performance and ALARA, with the carrot or the stick? What do you do when a worker refuses to implement radiation safety requirements? How do you deal with the images that workers may have about the consequences of exposure to radiation? How do you deal with grievances or union issues? What about a worker who files a complaint with the regulatory authorities and threatens legal actions? How do you respond to members of the public who believe that your facility is causing unacceptable radiation exposures? How do you answer questions from the news media? We will address these questions and others that you may pose with a few practical tools that you can easily learn. We will also include practice time in the class to help you begin to develop your skills with these tools. This class will build upon tools presented in Part A. Again, attendees are requested to bring at least three communication scenarios for practice with the tools provided in the class.


Robert Emery, Bruce Brown and Michael Charlton

_The University of Texas Health Science Center at San Antonio_

See description of PEP 1E for overview all of the 3 courses.

Part 3 will focus on “Measuring and Displaying Radiation Protection Program Metrics That Matter (to Management)”. Radiation protection programs typically accumulate data and documentation so that regulatory officials can assess compliance with established regulations. The implicit logic associated with this activity is that compliance equates to an acceptable level of safety. But in this era of constricted resources, mere regulatory compliance is no longer sufficient to justify all necessary programmatic resources. Radiation protection programs are now expected to readily demonstrate how they add tangible value to the core missions of an organization. The demonstration of this value is expected to be in the form of some sort of performance metrics, but this is an area in which many radiation safety professionals have not been trained. The issue is further compounded by the need to display the metric information in manners that are but succinct and compelling, yet another area where formal training is often lacking. This session will first describe a variety of possible radiation protection program performance measures and metrics, and then will focus on the display of the information in ways that clearly convey the intended message. Actual before and after data display “make-overs” will be presented and ample time will be provided for questions, answers, and discussion.

Each PEP segment is designed so that participants can take any session individually, although the maximum educational benefit will be derived from the participation in all three sessions. The particular topics included in the PEP series have been consistently identified as extraordinarily useful to participants in the highly successful week-long “University of Texas EH&S Academy”. Appropriate will be allotted for questions answers and discussion, and each segment will be supplemented with key reference information.

PEP 3F Photographic Film Dosimetry

_Ronald L. Kathren_

_Washington State University at Tri-Cities_

Photographic film has historically been used for personnel monitoring and still is widely used today. This course provides an overview of the basic principles of photographic film dosimetry for beta-and photon radiations and
neutrons, with emphasis will on recognition, identification and mitigation of sources of error and uncertainty and artifacts in film dosimetry, and as such should be of interest to persons doing historical dose reconstructions as well as those currently using film dosimetry for operation control. Topics covered include the theory of the latent image, film processing and development, beta and photon energy dependence, dose rate dependence, film badge design, effects of environmental factors including temperature, humidity, and chemical effects, calibration and interpretation of multielement badges for beta and photon mixed field radiations, precision and accuracy, conversion of dose to organ dose, and uncertainty analysis. Special techniques to extend the range of the film will also be discussed. A separate section will briefly cover nuclear track emulsions used for neutron dosimetry, and thus will be of particular value to persons doing historic dose reconstructions from personnel dosimeters utilizing photographic films, as well as for those utilizing photographic film dosimetry.

**PEP 3G Continuation of Occupational Internal Dosimetry Calculations (Part 2 of 2)**

**Tom LaBone**  
*MJW Corporation*

This is a continuation of PEP 2G. Please see the abstract listed for PEP 2G. Participants interested in this presentation should register for both Parts 1 and 2.

**PEP 3H Assumptions and Methods in Dose Reconstruction**

**Daniel J. Strom**  
*Pacific Northwest National Laboratory*

The requirements and equations for dose reconstruction in support of compensation decisions are presented. The notions of error, uncertainty, variability, and covariance are reviewed. Recently developed methods and assumptions for generic site technical basis documents for Atomic Weapons Employers under EEOICPA are covered. Methods and assumptions that can be used when there is a paucity of data are presented. Use and misuse of distributions, in particular the lognormal, is discussed with examples. A Monte-Carlo approach to analysis of uncertainty and variability in time-weighted average air concentrations is used to illustrate the methods, and two freeware computer programs (LOGNORM4 and Lognormal Fitting Utility) are demonstrated*. Independence and covariance, particularly over time, is discussed in the context of uncertainty for time series external dosimetry results and doses inferred from bioassay or workplace indicators. It is shown that ignoring covariance causes underestimation of uncertainty in dose reconstruction.

*Pacific Northwest National Laboratory is operated for the U.S. Department of Energy by Battelle under Contract DE-AC05-76RLO 1830.

**MONDAY - 12:15-2:15 PM**

**PEP M1 Basic Statistics**

**Steve S. Prevette**  
*Fluor Hanford*

This session will cover basic statistics for Health Physics. How to use the statistical formulae covered in the American Board of Health Physics examination will be provided. Hands-on physical demonstrations will be used to demonstrate statistical calculations such as mean, standard deviation, variance, and sampling. Counting statistics, the Chi Square Test and the Student T Test will be included. A basic introduction to the principles behind Bayesian statistical calculations will be performed using an ordinary set of playing cards. If you have questions about statistics and their usage, this session will be of help to you.

**PEP M2 Design, Fabrication, and Use of Anthropometric Phantoms for Calibrating Direct In Vivo Measurements of Internally-Deposited Radioactive Materials**

**Henry Spitz**  
*University of Cincinnati*

Conventional methods for direct, in vivo measurement of internally deposited, photon-emitting radioactive materials involve arranging one or more detectors on or near a subject in such a manner to optimize detection of the radiation emitted by the radioactive material suspected to be present in the body. Calibration factors, which relate the response of the detector system to the actual quantity of radioactive material being detected, are determined by measuring a surrogate for the human body which contains a known quantity of radioactive material that is distributed in a manner similar to that expected to be present in the subject being measured. The design of the surrogate (phantom) is dependent upon many factors, some of which include photon energy, activity distribution, detector type, and detector arrangement. A simple point source of a known quantity of a radioactive material located 30 cm from the detector may be an adequate calibration phantom for some applications. Alternatively, it may be necessary to use a surrogate that is a realistic approximation of the human form containing radioactive material distributed in a manner that simulates one or more of the internal body organs. This course will describe the design criteria, methods of fabrication, and the use of phantoms for measuring low photon energy (EXX 200 keV) emitting radionuclides deposited in the lungs, liver, and skeleton. Design criteria for adopting chemical formulations suitable for use as tissue substitutes in the Lawrence Livermore Thoracic Phantom as well as the skull and knee phantoms will also be described. Methods used at the University of Cincinnati for fabricating tissue substitutes used in these phantoms will be described.

**PEP M3 Cell and Molecular Effects of Low Doses of Radiation**

**Antone L. Brooks**  
*Washington State University TriCities*

Recent research has been conducted to provide solid data on the response of molecules, cells, tissues and organisms to very low doses of low LET ionizing radiation. Many new biological phenomena have been observed following low doses of radiation which suggest the need for paradigm changes in radiation biology. For example, it has been demonstrated that gene and protein expression change as a function of radiation dose and that these
changes can be related to biological effects not previously recognized. These new biological effects include radiation-induced apoptosis, adaptive responses, bystander effects, and genomic instability. It has also been determined that genetic background plays a major role in the magnitude of each of these biological responses to radiation. This presentation will review the mechanisms behind these changes as a function of radiation dose and discuss how dose-related changes in mechanisms can result in non-linear dose-response relationships.

Two different types of adaptive responses have been identified. First, low doses of radiation decrease the amount of damage observed relative to background levels. Second, a small “priming dose” of radiation given before a high acute “challenge dose” results in decreased biological response relative to that seen following the high dose alone. In studies of the adaptive response it has been demonstrated that different sets of genes are activated following either high or low doses of radiation, thus suggesting unique biological responses in cells that are capable of adaptive responses.

Bystander effects have been demonstrated that show that a cell traversed by an alpha particle or “hit” by a focused low LET beam communicate with neighboring cells and can produce changes in “non-hit” cells. These changes have been shown to be both “harmful” and “protective” and are most marked following exposure to high-LET radiation. This cell/cell communication impacts current use of “hit-theory” in defining radiation risk since it makes the radiation target is much larger than the individual cell.

Radiation-induced genomic instability is seen at a high frequency in cells many cell divisions after the radiation exposure. The instability results in increased frequency of mutations, chromosome aberrations, and cell killing. Radiation-induced genomic instability seems to be one of the early stages in the carcinogenesis process and has been seen both in vitro and in vivo. Genomic instability suggests there are frequent radiation-induced changes following radiation, rather than rare mutational events.

Tissue interactions have been shown to modify the expression of cellular and molecular damage and to be critical in the expression of cancer. Both initial biological damage and cancer incidence can be modified with treatment after radiation exposure.

These recent scientific advances provide a scientific basis for the observed non-linear dose-response relationships seen in many biological systems. These new biological findings that make it necessary for the field of radiation biology to adopt new paradigms associated with the biological responses to low doses of radiation. It is important that these new paradigms be recognized by regulatory and scientific community to better evaluate the risks and hazards associated with low doses of ionizing radiation.

Research supported by Office of Science (BER), U.S. DOE through grant No. DE-FG02-99ER62787 to Washington State University.

PEP M4 Training for Medical Examiners and Coroners in Handling Fatalities from INDs

C.M. Wood

Center for Disease Control

Detonation of a radiological WMD could result in a large number of radioactively contaminated fatalities. There is a need for training for medical examiners and coroners, in dealing with this situation.

CDC has guidelines pending publication. The New York City Office of the Chief Medical Examiner staff and the past president of the National Funeral Directors’ Association have assisted in this effort. This presentation will summarize CDC's guidelines and suggest some ways the nuclear industry could assist medical examiners, coroners, and funeral directors.

The planning and safety precautions followed in a nuclear power plant for maintenance in a radiologically controlled area are appropriate for medical examiners and coroners. The purpose of this presentation is to encourage a dialogue between the two communities.

PEP M5 Technical Auditing for Health Physicists (Part 1 of 3 on Laboratory Accreditation, See PEPs T5 and W5)

Sam Keith, Ken Swinth, and Tom Slowey

HPS Laboratory Accreditation Policy Committee

The objective of this professional enrichment program topic is to provide a framework around which the participant can help customers (assessees) improve through the process of technical assessment. Technical assessing requires an assessor to know what's important in an industry and where to help the assessee focus resources for optimization of the production process. The philosophy espoused during the training is that compliance and conformance form the bedrock from which a business can improve and optimize operations. The “why” is the most important part in helping the assessee understand the “how” of improvement. The process is presented around the Plan-Do-Study-Act model. Techniques will be presented to assist assessors communicate with the team, the customer, interviewees and the sponsoring organization. The presentation is general enough to apply to all health physics areas.

This course provides information to individuals interested in the HPS accreditation program, and is also part of a course for certifying individuals to assess laboratories for HPS accreditation.

TUESDAY - 12:15-2:15 PM

PEP T1 Choosing Radiological Performance Indicators

Steve Prevette

Fluor Hanford

This session will provide ideas on deciding what to measure, how to analyze the resulting numbers, and how to make decisions from the results. Suggested Leading and Lagging performance indicators will be discussed, and case studies provided. Analysis will focus upon the use of Statistical Process Control for trending, and Pareto Charting for categorization of causes and events.
Techniques in use at the Hanford Washington Department of Energy site will be overviewed. If you are involved with, or have been a victim of performance measures, this session will help you succeed with your measures.

PEP T3  Statistics – What Is It Good For?  (A Practical Primer for the Practicing Professional)
Jay A. MacLellan
Pacific Northwest National Laboratory

This class will be of particular interest to those charged with interpreting low-level measurements such as bioassay, release surveys, or environmental sample results. The very low-level detection capabilities often required for such analyses pose real data interpretation challenges. Protocols for confirming the presence of radioactivity in bioassay and general monitoring data require defensible statistical assumptions and proper interpretations of results. Statistical capability descriptions (false-positive and false-negative rates) may be fairly clear-cut at the performance testing and contractual detection level, but when the activity level drops to the decision level the definition of “positive” becomes ambiguous. Using detection protocols that require repeat measurements of samples can also hold surprises that seem counter-intuitive. Also, detection criteria based on the estimated uncertainty of results with zero background or net counts may require special consideration. The emphasis for the presentation will be on the concepts of statistical protocols rather than the math.

PEP T4  Overview of Interactive Radioepidemiological Program (IREP)
David C. Kocher
SENES Oak Ridge, Inc.

The Interactive RadioEpidemiological Program (IREP) is a web-based, interactive computer program to estimate the probability that a given cancer in an individual was induced by given exposures to ionizing radiation. This probability is referred to as “probability of causation/assigned share” (PC/AS). IREP is used to estimate PC/AS in compensation programs for energy workers and military participants at atmospheric nuclear-weapons tests. IREP calculates PC/AS for all cancer types except chronic lymphocytic leukemia. PC/AS for a given cancer in an individual is calculated from an estimate of the excess relative risk (ERR) associated with given radiation exposures and the relationship PC/AS = ERR/(ERR + 1). IREP is intended to provide unbiased estimates of ERR and PC/AS and their uncertainties to represent the current state of knowledge. A full accounting of uncertainty is necessary when decisions about granting claims for compensation for cancer are made on the basis of an estimate of the upper 99% credibility limit of PC/AS to given claimants the “benefit of the doubt” in the presence of uncertainty. This lecture presents an overview of models and methods incorporated in IREP to estimate probability distributions of ERR and PC/AS including (1) models to estimate ERRs for specific cancer types in study populations, principally the Japanese atomic-bomb survivors, as a function of sex, age at exposure, and attained age or time since exposure, (2) corrections to ERRs in study populations to account for random and systematic errors in dosimetry, (3) adjustments to ERRs at times shortly after exposure to account for a minimum latency period of specific types of cancer, and (4) adjustments to apply ERRs in atomic-bomb survivors to the U.S. population and to conditions of exposure other than acute exposure to low-LET radiations at relatively high doses. Approaches to accounting for uncertainty in the models are emphasized. Limitations of IREP are discussed, and modifications that may be incorporated in future versions of the program are mentioned. [The findings and conclusions in this Abstract have not been formally disseminated by the National Institute for Occupational Safety and Health (NIOSH) and should not be construed to represent any agency determination or policy. This work is supported by NIOSH under Contract No. 200-2006-18097.]
Mixed Waste contains both radiological and chemical constituents and is subject to complex regulations and legal requirements making storage, treatment, transportation, and disposal difficult and expensive. Management of mixed waste at academic and medical institutions can be especially difficult because of the small quantities and wide varieties of wastes generated. Because these organizations are often non-profit or government funded, it is important to keep costs down while maintaining regulatory compliance. Although often perceived as difficult, it is possible to be in compliance with all Federal and State EPA and NRC regulations without going over budget.

This PEP will focus on mixed waste management techniques at universities and medical institutions. An overview of the many regulations and enforcement agencies will be presented, focusing on the EPA Conditional Exemption for the Storage, Treatment, Transportation, and Disposal of Mixed Wastes. Sorting and segregation schemes for managing mixed waste will be presented and discussed. Training mixed waste generators is perhaps the most effective means of managing mixed waste. Creative ideas will be presented that allow waste managers at academic and medical institutions to train waste generators and reduce the cost of mixed waste disposal at the same time.
detection and an overview of devices used to detect SNM. The following topics will be covered: fast neutron detectors; thermal neutron detectors; neutron moderation and absorption; passive neutron counting with SNAP detectors; passive neutron coincidence and multiplicity counting; active neutron interrogation; and portal monitors.

PEP W5 Introduction to Uncertainty Calculation (Part 3 of 3 on Laboratory Accreditation, See PEPs M5 and T5)
Carl V. Gogolak
HPS Laboratory Accreditation Policy Committee

An important element in the activities of health physicists who are responsible for the safety of personnel and the general public is the measurement of radiation from various sources, including reactors, radiation-generating machines and radioactive sources used in industry and in the medical diagnosis and treatment of patients. To be meaningful, these measurements must be made using instruments and sources that are not only traceable to a national standards laboratory (e.g., NIST) but also must be performed by competent personnel using appropriate technical standards and procedures designed to ensure the calibration results meet required uncertainty.

The definition of traceability that has achieved global acceptance in the metrology community is contained in the International Vocabulary of Basic and General Terms in Metrology (VIM; 1993):

“...the property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken chain of comparisons, all having stated uncertainties.”

Because of the importance of uncertainty calculations in Laboratory Accreditation this course will concentrate on the corresponding technical issues involving laboratory quality assurance, the estimation of uncertainty, and limits of detection. Internationally recognized standards from ISO GUM and their NIST counterparts will be explained using examples. Software developed for implementing these standards will be demonstrated.
Continuing Education Lectures
Monday, July 9 through Thursday, July 12 - 7:00-8:00 AM
Included in Registration Fee

**MONDAY 7:00-8:00 AM**

**CEL1 A105**

**Workforce Pipelines for the Nuclear Renaissance**

Ken Ferguson
Ken Ferguson, LLC

We are now in a place where nuclear industry participants have been striving and awaiting for decades...a rebirth and renaissance of major initiatives and opportunities. New nuclear power plants, the needs of dozens of operating nuclear plants with extended operating licenses, management of weapons grade nuclear materials, waste management, recycling of nuclear materials are examples of the work ahead. Challenges related to an effective response include a mismatch of staffing needs and the related anticipated pipelines of new entrants to the nuclear workforce projected for the future. This lecture will provide a review of the resurgence of needs, opportunities, and challenges in which health physics plays a vital consideration. Important features of past and ongoing work related to meeting such workforce pipelines will be addressed including a discussion of key elements of a current, major initiative with a focus on development of a new entry workforce pipeline for the nuclear segment. The lecture will cover the variety of attentions necessary for such efforts to be successful and progress to date.

**CEL2 A106**

**Medical Reserve Corps (MRC) – Volunteer Opportunity for Health Physicists to Contribute to Their Local Communities**

Armin Ansari
Centers for Disease Control and Prevention, Atlanta

The Medical Reserve Corps (MRC) are community-based teams of local volunteer medical and public health professionals who can contribute their skills and expertise throughout the year as well as during times of community need. There are currently more than 500 MRCs in the nation covering all 50 states with more than 80,000 professionals and ordinary citizens participating. The MRC provides the organizational structure and appropriate training so that the unit and its volunteer members are well-integrated in their local emergency response structure and would operate in a NIMS-compliant manner. 75% of MRCs are housed in local/county health departments. Being volunteer members of MRC provides a personal recognition and familiarity for health physicists in their community, and that can be a priceless asset at a time of real radiation emergency. As an MRC member, health physicists also have an opportunity to educate and increase radiation literacy among their MRC peers and in their community. The time commitment is minimal. Potential rewards are significant.

**TUESDAY 7:00-8:00 AM**

**CEL3 A105**

**ON ALERT: Post 9/11 Integrated Emergency Planning**

Lawrence T. Dauer
Memorial Sloan-Kettering Cancer Center

In the post 9/11 period, there has been a coordinated country-wide effort to improve response systems and to develop the prevention, preparedness, recovery, and mitigation capabilities of Federal, State, local, private-sector, and non-governmental organizations. A National Incident Management System has been developed to encourage all parties to work together effectively and efficiently to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity, including acts of catastrophic terrorism. Historically, health physics and radiation safety staffs have played central roles in individual site, local community, and state/national emergency response planning and events.

This CEL will present an overview of the current integrated emergency planning processes. It is the intent of the course to provide the radiation safety officer or radiation safety professional with tools necessary to respond to all emergencies within the current incident response framework. The following topics will be covered:

1) What’s so bad about that? (hazard vulnerability and assessment);
2) Knowledge itself is power (CBRNE facts)
3) Hiking up the chain of command (incident command systems)
4) I love it when a plan comes together (practical emergency planning and administration tips)
5) It is all people stuff (the psychology of disaster).

**CEL4 A106**

**Image-Based Methods in Internal Dose Calculations – Current Status**

Mike Stabin
Vanderbilt University

Both standardized dose calculations for diagnostic uses of radiopharmaceuticals and patient-individualized methods, mostly for use in therapeutic applications, are currently moving towards image-based methods and models. These techniques will soon replace approaches using the stylized, mathematical models that have been in use for some decades. In this lecture, currently available models and ongoing research in this area will be discussed. Available body and organ models, for humans and animals, and internet and software tools and resources will be reviewed. A review of Monte Carlo techniques for use of these kinds of image-based models in radiation transport calculations will also be given. The emphasis will be on the practical use of these models and tools in problem solving, particularly for individual nuclear medicine patients in therapy.
In 1998, the Food and Drug Administration (FDA) issued an update to their 1982 recommendations on accidental radioactive contamination of human food and animal feeds. The recommendations provide guidance on limiting dose received as result of ingestion of accidentally contaminated food by setting Derived Intervention Levels (DILs) and taking protective action. This lecture will provide an overview of ingestion DILs and Derived Response Levels (DRLs) for emergency planning and response and discuss their development and implementation at the Savannah River Site (SRS).

In March 2006, an accident occurred at an industrial irradiator in Fleurus, Belgium, that resulted in inadvertent exposure of an operator at the facility. Due to mechanical problems with the irradiator, the source rack rose from its fully shielded position to a height within the water storage pool that resulted in large dose rates inside the irradiator while an individual was in the irradiator room. At the time of the accident, the irradiator held approximately 770,000 curies of cobalt-60, which resulted in a dose to the individual of 4.4 to 4.8 Gy.

The lecture will explain the accident timeline, discuss the causes of the accident from a system design and procedural perspective, and describe the corrective actions that have been implemented since the accident. Relevance of the root cause to other irradiator designs will be discussed, with particular attention to mechanical and programmatic protections that should be in place at all such facilities.

This class will describe concepts and options on training First Responders (EMTs, Fire Fighters, HAZMAT Teams and Law Enforcement personnel) on issues concerning responses to incidents involving RDDs and INDs. Background information on likely sources of RAM and SNM will also be reviewed. A review of current guidance documents, such as NCRP Commentary No. 19, will be discussed.

This class will describe concepts and options on training First Responders (EMTs, Fire Fighters, HAZMAT Teams and Law Enforcement personnel) on issues concerning responses to incidents involving RDDs and INDs. Background information on likely sources of RAM and SNM will also be reviewed. A review of current guidance documents, such as NCRP Commentary No. 19, will be discussed.
HPS Member Number: hps

Name for badge: (First)________________________________(Last) _______________________________(Nickname)_________________

Affiliation (for badge) (limit to 18 characters and spaces): ____________________________________________________________________

Address (for confirmation):____________________________________________________________________________________________

City ______________________________________________State: _______________ Zip/Postal Code: _______________

Phone: ______________________________________________FAX:____________________________________________

Email:  ______________________________________________If Registering - Companion Name: __________________________________

REGISTRATION FEES: (Mark Appropriate Boxes)                                      Preregistration Fees | On-Site Fees

- HPS Member (Sun. Reception, Mon. Lunch, Tues. Awards Dinner) $350 | $425
- Non-Member (Sun. Reception, Mon. Lunch, Tues. Awards Dinner) $420* | $495*
- CRSO Registration $125 | $140
- HPS Member/CRSO Registration (all events, both groups) $425* | $515
- HPS Non-Member/CRSO Registration (all events, both groups) $495* | $585*
- Student (Sun./Student Receptions, Mon. Lunch, Tues. Awards Dinner) $ 60 | $ 60
- One-Day Registration Mon/ Tues/ Wed/ Thurs $225 | $225
- HPS Emeritus Member (Sun. Reception, Mon. Lunch, Tues. Awards Dinner) No Fee | No Fee
- HPS PEP Lecturer (Sun. Reception, Mon. Lunch, Tues. Awards Dinner) No Fee | No Fee
- Companion (Sun. Reception, Mon.-Wed. Continental Breakfast & pm snacks) $ 55 | $ 55
- Exhibition ONLY (Exhibit Hall Badge) $ 25 | $ 25
- Exhibitor (Two Per Booth) No Fee | No Fee
- Additional Tues. Awards Dinner Ticket(s) # of Tickets $ 60 | $ 60
- AAHP Awards Lunch Ticket(s) (Tues.) ‘06 NEW CHP Check if attending Free | Free
- AAHP Awards Lunch Ticket(s) (Tues.) CHP other than above $ 10 | $ 10
- AAHP Awards Lunch Ticket(s) (Tues.) Guest $ 15 | $ 15

*Includes Associate Membership for year 2007 - FIRST TIME MEMBERS ONLY

Would you like your name included on the Attendee List?  □ Yes    □ No

SOCIAL PROGRAM

<table>
<thead>
<tr>
<th>Preregistration Fees</th>
<th>On-Site Fees</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eola Hills Winery Tour and Brunch (Sunday, 7/8)</td>
<td># of Tickets X $45</td>
<td># of Tickets X $55</td>
</tr>
<tr>
<td>Portland City Tour (Sunday, 7/8)</td>
<td># of Tickets X $40</td>
<td># of Tickets X $45</td>
</tr>
<tr>
<td>Portland City Tour (Monday, 7/9)</td>
<td># of Tickets X $40</td>
<td># of Tickets X $45</td>
</tr>
<tr>
<td>Mount Saint Helens (Monday, 7/9)</td>
<td># of Tickets X $59</td>
<td># of Tickets X $64</td>
</tr>
<tr>
<td>Annual HPS 5K Run/Walk (July 10) 5k</td>
<td># of Tickets X $25</td>
<td># of Tickets X $30</td>
</tr>
<tr>
<td>Northern Oregon Coast (Tuesday, 7/10)</td>
<td># of Tickets X $58</td>
<td># of Tickets X $63</td>
</tr>
<tr>
<td>Golf Eastmoreland (Tuesday, 7/10) 18 hole walking/golfing</td>
<td># of Tickets X $80</td>
<td># of Tickets X $85</td>
</tr>
<tr>
<td>Oregon Wineries (Wednesday, 7/11)</td>
<td># of Tickets X $80</td>
<td># of Tickets X $85</td>
</tr>
<tr>
<td>HPS Night Out Dinner Cruise on Sternwheeler (Wed, 7/11)</td>
<td># of Tickets X $55</td>
<td># of Tickets X $60</td>
</tr>
<tr>
<td>Portland Microbrews Brew Bus (Wednesday, 7/11)</td>
<td># of Tickets X $40</td>
<td># of Tickets X $45</td>
</tr>
<tr>
<td>Columbia Gorge and Multnomah Falls (Thursday, 7/12)</td>
<td># of Tickets X $40</td>
<td># of Tickets X $45</td>
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</table>

TECHNICAL TOURS

<table>
<thead>
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<th>Preregistration Fees</th>
<th>On-Site Fees</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reed College Reactor Facility (Tuesday, 7/10)</td>
<td># of Tickets X $15</td>
<td># of Tickets X $20</td>
</tr>
<tr>
<td>Oregon Health &amp; Sciences University (Wednesday, 7/11)</td>
<td># of Tickets X $8.25</td>
<td># of Tickets X $8.25</td>
</tr>
</tbody>
</table>

PAYMENT INFORMATION - Government Requisitions are accepted for registration, however Purchase Orders are NOT accepted for PEP, AAHP, Social/Technical Tour Registration.  HPS TAX ID # 04-6050367

Check Payment:  Health Physics Society, 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101

[ ] VISA  [ ] MasterCard  [ ] American Express  [ ] Discover

Card Number ____________________________ Exp. Date ______________

Credit Card Billing Address: ____________________________________________

Cardholder Name: _____________________________________________________

Signature _____________________________________________________________

Registration Section Total $__________

Social Program/Technical Tours Total $__________

AAHP/PEP Total (From Back of Form) $__________

TOTAL FEES ENCLOSED $__________

Please see AAHP/PEP Registration form and Disabilities information on following page

53
Your Housing while in Portland: _____________________________________________

Name: ________________________________________________________________

DISABILITIES: The Annual Meeting is accessible to persons with disabilities. Please specify assistance required and a HPS representative will contact you.

AAHP COURSES: Saturday, 7/7 - 8:00 AM - 5:00 PM

- Course 1 - Eight-hour OSHA Hazardous Waste Operations Refresher Training. Jan Johnson, Judson Kenoyer $200.00
- Course 2 - Emergency Dose Assessment. Steven F. LaVie, Randolph L. Sullivan, Patricia A. Milligan $200.00
- Course 3 - Homeland Security Instrumentation for the Health Physicist. Brian Rees $200.00

PROFESSIONAL ENRICHMENT PROGRAM:

Sunday, 7/8

8:00 - 10:00 AM

1A Identification and Control of Electromagnetic Fields (0 - 300 GHz) (Part 1 of 3). John Leonowicz
1B Medical Internal Dose Calculations – Current Methods and Tools. Mike Stabin
1C Neutron Dosimetry. Joe McDonald
1D Saving Lives and Changing Family Histories: Appropriate Utilization of in utero ... Robert Brent
1E EH&S “Boot Camp” ... (Part 1 of 3). Robert Emery, Bruce Brown, Michael Charlton
1F ON ALERT: Post 9/11 Integrated Emergency Planning. Lawrence T. Dauer
1G Multi-Agency Radiation Survey and Assessment of Materials and Equipment Manual ... Carl Gogolak
1H Medical Health Physics Refresher. Mike Charlton

Sunday, 7/8

10:30 AM - 12:30 PM

2A Non-ionizing Radiation: An Overview of Incoherent ... (Part 2 of 3). Tom Johnson
2B RDD/IND Awareness Training for First Responders. Ken Groves
2C Advances in Customized Phantoms and Organ Models for ... Wesley Bolch
2D Fundamentals of Radiation Risk Communication ...(Part 1 of 2). Ray Johnson
2E EH&S “Boot Camp” ...(Part 2 of 3). Robert Emery, Bruce Brown, Michael Charlton
2F Health Physics Aspects of Depleted Uranium (DU). Ronald L. Kathren
2G Occupational Internal Dosimetry Calculations (Part 1 of 2). Tom LaBone
2H Review of IATA Requirements for Air Transportation of Radioactive Material. Sean M. Austin

Sunday, 7/8

10:30 AM-12:30 PM

___/___/___ = $60.00
1st 2nd 3rd

Yes, stand by list

Sunday, 7/8

10:30 AM-12:30 PM

___/___/___ = $60.00
1st 2nd 3rd

Yes, stand by list

Monday, 7/9

12:15 - 2:15 PM

M1 Basic Statistics. Steve S. Prevette
M2 Design Considerations for Industrial Radiation Processing. Mark Smith
M3 Instrument Selection, Calibration, and Use for Unrestricted Release. Ed Walker
M4 Fundamentals of Radiation Risk Communication ...(Part 2 of 2). Ray Johnson
M5 Photographic Film Dosimetry. Ronald L. Kathren
M6 Continuation of Occupational Internal Dosimetry Calculations (Part 2 of 2). Tom LaBone
M7 Assumptions and Methods in Dose Reconstruction. Daniel J. Strom

Monday, 7/9

12:15 - 2:15 PM

___/___/___ = $60.00
1st 2nd 3rd

Yes, stand by list

Tuesday, 7/10

12:15 - 2:15 PM

T1 Choosing Radiological Performance Indicators. Steve Prevette
T2 Radiological Design Review of Radiological Facilities and Equipment. Gloria T. Mei
T3 Radiation Guidance: What Is It For? A Practical Primer for the Practicing Professional. J.A. MacLellan
T4 Overview of Interactive Radioepidemiological Program (IREP). David C. Kocher
T5 HPS Laboratory Accreditation Program Assessor...(Part 2 of 3 Lab Accred). Ken Swinth

Tuesday, 7/10

12:15 - 2:15 PM

___/___/___ = $60.00
1st 2nd 3rd

Yes, stand by list

Wednesday, 7/11

12:15 - 2:15 PM

W1 Mixed Waste Management at a Large University / Medical Institution. Mike Zittle
W2 Health Physics Concerns of Neutron Exposures... David R. Simpson
W3 Health Physics Society Technical Assistance ... Thomas O'Connell, Thomas Clawson
W5 Introduction to Uncertainty Calculation (Part 3 of 3, Lab Accred). Carl V. Gogolak

Wednesday, 7/11

12:15 - 2:15 PM

___/___/___ = $60.00
1st 2nd 3rd

Yes, stand by list

Are you interested in being a Mentor at the meeting?  Yes No

Are you interested in working with a Mentor at the meeting?  Yes No

If FAXing registration form, (703) 790-2672 please do not mail the original.

AAHP Total $ __________
PEP Total $ __________
AAHP/PEP Total $ __________

(Transfer this total to previous page)