FINAL PROGRAM

55th Annual Meeting of the Health Physics Society

(American Conference of Radiological Safety)

22nd Biennial Campus Radiation Safety Officers Meeting

27 June - 1 July 2010

Salt Palace Convention Center

Salt Lake City, Utah

Headquarters Hotel

Hilton Salt Lake City Center
255 South West Temple
Salt Lake City, Utah 84101
Telephone: 801-328-2000
Fax: 801-238-4888

Speaker Ready Room

Salt Palace Convention Center, Room 150D

Sunday . . . . . 2:00-5:00 pm
Monday-Wednesday . . . . . 8:00-11:00 am; 2:00-5:00 pm
Thursday . . . . . 8:00-10:00 am

You must check in at the Ready Room (even if you have already submitted your presentation).
See **Page 11** for more information.

Meeting Sponsors

Thank you to the following meeting sponsors

Energy*Solutions* = Platinum
PerkinElmer = Welcome Reception
Safety and Ecology Corporation (SEC) = Bronze

HPS Secretariat
1313 Dolley Madison Blvd.
Suite 402
McLean, VA 22101
(703) 790-1745; FAX: (703) 790-2672
Email: hps@burkinc.com; Website: www.hps.org

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Registration Hours and Location

Registration at the Salt Palace Convention Center
Ballroom A/B Foyer

Saturday, 26 June	2:00 - 5:00 pm
Sunday, 27 June	10:00 am - 5:00 pm
Monday, 28 June	8:00 am - 4:00 pm
Tuesday, 29 June	8:00 am - 4:00 pm
Wednesday, 30 June	8:00 am - 4:00 pm
Thursday, 1 July	8:00 - 11:00 am

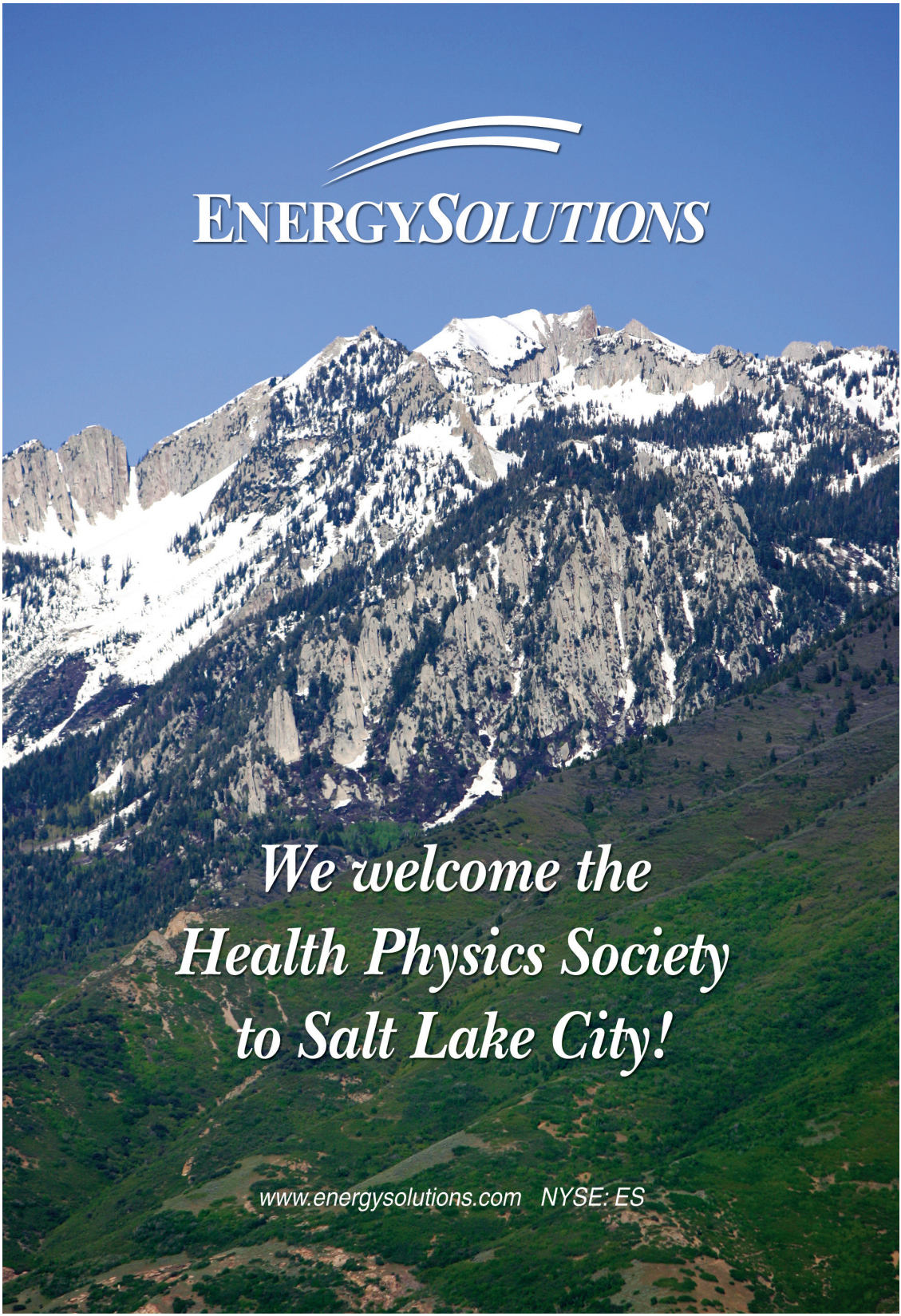
Future Midyear Topical Meeting

44th	6-9 February 2011	Charleston, SC

Future Annual Meetings

56th	26-30 June 2011	Palm Beach, FL
57th	21-26 July 2012	Sacramento, CA

Look online for future meeting details
hps.org/meetings


ENERGYSOLUTIONS
We welcome the
Health Physics Society
to Salt Lake City!
www.energysolutions.com NYSE: ES

Officers

Howard W. Dickson, President
Edward F. Maher, President Elect
Robert Cherry, Jr., Secretary
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John P. Hageman, Treasurer-Elect
Richard E. Toohey, Past President
Richard J. Burk, Jr., Executive Secretary

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Eric Goldin
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Patricia L. Lee
Matthew P. Moeller
Dan Strom
Terry Yoshizumi

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Matthew C. McFee, Program Committee Chair
Genevieve S. Roessler, Newsletter Editor-in-Chief, Web Site Editor
Michael T. Ryan, Journal Editor-in-Chief

2010 Program Committee

Chair: Matthew C. McFee, ‘12
Nicolas Bates, ‘10
Robin Hill, ‘10
Tara Medich, ‘10
Laura Pring, ‘10
Kathryn Brock, ‘11
Ben Edwards, ‘11
Tim Taulbee, ‘11
Kelly Crandall, ‘11
Tim Kirkham, ‘12
Bryan Lemieux, ‘12
Michael Noska, ‘12
Latha Vasudevan, ‘12

2010 Task Force - Salt Lake City

Matthew McFee, Program Committee Chair
Ben E Edwards, Task Force Chair
Nick Bates
Kathy Brock
Tim Kirkham
Bryan Lemieux
Tony Mason
Tara Medich
Michael Noska
Latha Vasudevan

Local Arrangements Committee

Co-chairs: Karen Langley, James O’Rear
Adam Arndt
Dave Bernhardt
Bill Craig
Julie Felice
Jared Frandsen
Robert J. Hoffman
Wayne Johns
Steve Jones
Elliott Lesses
Jeff Lodwick
Tony Mason
Joe McDonald
Abol Mortazavi
John Olson
Dell Potter
Farand Smith
Walter Wagner

Important Events

Welcome Reception

Please plan on stopping in at the Hilton Hotel, Grand Ballroom, on Sunday, 27 June, from 6:00-7:00 pm. There will be an opportunity to meet friends to start your evening in Salt Lake City. Cash bar and light snacks will be available.

Exhibits

Free Lunch! Free Lunch! – Noon, Monday, 28 June. 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!

Sessions and Course Locations

AAHP Courses on Saturday take place in the Hilton Hotel. All other PEPs, CELs and sessions Sunday through Thursday will take place at the Salt Palace Convention Center.

HPS Awards Banquet

An enjoyable evening spent with members of the Health Physics Society. This event will be held on Tuesday, 29 June, in the Hilton Hotel Grand Ballroom, 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 7:00-9:00 pm.

HPS Annual Business Meeting

The Business Meeting will be convened at 5:15 pm on Wednesday, 30 June, in Ballroom B Salt Palace.

Different this YEAR!
CRSO is meeting with HPS
CRSO Sessions are Wednesday afternoon and Thursday morning -
See pages 42 and 47 for details

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, 1:00-3:00 pm
No other sessions at that time

AAHP Awards Luncheon

The AAHP is sponsoring an Awards Luncheon on Tuesday, 29 June, Noon-2:15 pm, in the Salt Palace Convention Center, Room 151G. You may purchase tickets on site at the Registration Desk.

Tuesday Evening Awards Reception & Banquet

Join your peers in honoring the following awardees while enjoying a delicious meal. Brief award presentations will immediately follow the dinner. All attendees are strongly encouraged to stay and show support for the award recipients. This event will take place in the Hilton Salt Lake City Center Grand Ballroom on Tuesday, 29 June from 7:00 - 9:00 pm. The following awards are to be presented:

Distinguished Achievement Award
Ralph Lapp

Distinguished Public Service Award
Presented during Plenary Session
Pete Lyons

Elda E. Anderson Award
Derek Jokisch

Founders Award
Bryce Rich

Evans Medal Award
William J Bair

Science Teacher Award
Shannon Hudson

Honor Roll Awards
Lutz Moritz
James E. Watson, Jr

Fellows

Eugene H. Carbaugh	Steven H. King
Thomas H. Essig	Kent N. Lambert
Barbara L. Hamrick	Harold T. Peterson, Jr.

New This Year

Honor Roll Award

This award is given posthumously to honor Society members who significantly contributed to the profession of health physics during their careers, but were not otherwise honored by the Society during their lifetimes. Such contributions may include, but are not limited to education, research and administration.

Tuesday Evening Awards Menu

Hilton house salad, Mediterranean stuffed breast of chicken, Utah creamed corn and wild rice, dessert trio of marinated berries, petite creme brulee and flourless chocolate cake, raspberry lemonade, coffee, tea and decaf

G. William Morgan Trust Fund

When G. William Morgan died in 1984, he bequeathed a substantial fund to the Health Physics Society. The will requires that the fund's interest be used to have internationally known experts present papers at the Society's meetings. Michael C. O'Riordan of the United Kingdom's National Radiation Protection Board was the first international expert to be supported by the Society through the Morgan Fund. O'Riordan's presentation "Radon in Albion" was part of the Indoor Radon Session at the 1989 Albuquerque meeting.

G. William Morgan was a Charter member of the Society and during the Society's early years a very active member. Bill began his health physics career at Oak Ridge National Laboratory as part of the Manhattan Project. He later joined the Atomic Energy Commission and was instrumental in the development of the initial regulations that became part of 10 CFR Part 20. He was a great champion of education and helped establish the AEC Health Physics Fellowship Program. Bill later became very successful in the real estate business, but always retained his interest in the health physics profession. The Society's Presidents Emeritus Committee has responsibility for the selection of the international experts who will be supported by the G. William Morgan Trust Fund.

EITC
Eastern Idaho Technical College

Radiation Safety

The Technical Certificate program teaches entry-level skills required for employment as Radiation Control/Health Physics Technicians in the nuclear industry. Qualified radiation safety technicians work at Commercial nuclear power plants regulated by the Nuclear Regulatory Commission (NRC), National Laboratories overseen by Department of Energy (DOE), and other dosimetry laboratories, medical facilities, and independent and university research facilities that work with radioactive materials.

Program instructional components will be provided in the areas of radiation protection, radiation detection and instrumentation, safety and hygiene, communications in radiological safety, practical radiation survey techniques, nuclear plant systems, and radiological chemistry. Students are HAZWOPER trained and respirator qualified.

WHY TRAINING AT EITC?

Our students make the best RCTs/HPs available in the industry.

Real Education • Real Jobs • Real Life

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AA/EEO Institution

Registration Fees:

	Pre	On-Site
HPS Member	$390	$475
HPS Member with '10 DUES	$520	$605
Non-Member	$485*	$575*
CRSO	$100	$115
HPS Member/CRSO Reg	$465	$565
HPS Member with HPS dues/CRSO Reg	$595	$695
HPS Non-Member/CRSO Registration	$560*	$665*
Student	$ 60	$ 60
Emeritus Member	$195	$238
One-Day Registration	$250	$250
HPS PEP Lecturer	- - -	- - -
Companion	$ 65	$ 65
Emeritus Companion	$ 33	$ 33
Exhibition ONLY	$ 35	$ 35

Badge Color Code:

White=HPS Member, NonMember, Student
Blue=Companion
Green=Exhibition Only
Salmon=Exhibitor

Session Location

All sessions will take place in the Salt Palace Convention Center unless noted otherwise.

LAC Room

Sunday-Thursday 150E
Salt Palace Convention Center

Activities and Tours

Note: Tickets still available for sale; they can be purchased at the HPS Registration Desk.

Sunday 27 June

"America's Choir" 8:30-10 AM
(no ticket or sign up required)

Monday 28 June

Open Mic Night 8-11 PM
(no ticket or sign up required)

Tuesday 29 June

5K Run/2K Walk 6:30-8:30 AM

Wednesday 30 June

Park City 8:30 AM-5:30 PM
Pub Crawl 6-11 PM

Thursday 1 July

Tech Tour
EnergySolutions 8:30 AM-1 PM

OPEN MIC NIGHT

The 2010 (5th Annual) HPS Open Mic Night will be held on Monday, 6/28/10 at Keys on Main – featuring the host band Mollydrive with special guest vendor band "Randy Radman and The Exhibitors". The doors open at 8:00 PM with music beginning at 9:00 – going until they kick us out – or we run out of songs.

Please subscribe to the Facebook page – HPS Open Mic Night to get involved and stay up to date on all of the event details. If you are Facebook averse, please feel free to contact John O'Neil at joneil@chaseenv.com to make requests and get involved!

We hope to see you all there. The event will be limited to 21 and older. Photo identification will be required.

Speaker Information

Technical Sessions

Speaker Instructions

You are allotted a total of 12 minutes of speaking time unless you have been notified otherwise.

The Ready Room (Room 150D, Salt Palace Convention Center) will be open Sunday from 2-5 pm, Monday through Wednesday from 8-11 am and 2-5 pm, and Thursday 8-10 am. You must check in at the Ready Room (even if you have already submitted your presentation) no later than the following times:

Presentation Time	Check-In Deadline
Monday am	5 pm Sunday
Monday pm	11 am Monday
Tuesday am	5 pm Monday
Tuesday pm	11 am Tuesday
Wednesday am	5 pm Tuesday
Wednesday pm	11 am Wednesday
Thursday am	5 pm Wednesday

Please report to your session room 10 minutes prior to the Session start to let your session chair(s) know that you are there.

PEP/CEL Courses

The PEP Ready Room (251A) in the Convention Center will have hours posted on the door Saturday-Thursday.

Placement Service

Placement Service listings will be posted in the Exhibit Hall.

Companion Hospitality Room

The Hospitality Room is in Room 324 on the 3rd level of the Hilton Hotel. Come meet with friends and learn about the available attractions in Salt Lake. Local HPS members will be on hand to help with planning day trips and restaurant recommendations. On Monday morning from 8 to 9 am, we invite all registered companions to an official welcome from a local representative who will provide an orientation to Salt Lake and answer any questions you might have. The Monday breakfast will take place in the Topaz Room in the Salt Lake Hilton.

Continental breakfast will be available Monday through Wednesday mornings for registered companions.

Hospitality Room
for Registered Companions
in the Hilton Salt Lake
Room 324

Monday Welcome Breakfast
8:00-9:00 am, Topaz Room

Days/Hours
Room 324

Sunday ..... 10 am - Noon
Monday..... 9 am - 1 pm
Tuesday..... 8 am - 1 pm
Wednesday..... 8 am - 1 pm

Health Physics Society Committee Meetings

Salt Lake City Hilton (H); Salt Palace Convention Center (CC)

Friday, 25 June 2010

ABHP BOARD MEETING
8:30 am-5:00 pm *Salon 2 (H)*

Saturday, 26 June 2010

FINANCE COMMITTEE
8:00 am-Noon Granite Boardroom (H)

ABHP BOARD MEETING
8:30 am-Noon *Salon 2 (H)*

HPS EXECUTIVE COMMITTEE
Noon-4:00 pm *Presidental Suite*

AAHP EXECUTIVE COMMITTEE
1:00-5:00 pm *Salon 2 (H)*

HP/ORS JOURNAL BOARD MEETING
3:00-6:00 pm *Topaz Room (H)*

Sunday, 27 June 2010

AAHP EXECUTIVE COMMITTEE
10:30 am-5:00 pm *Salon 2 (H)*

HPS BOARD OF DIRECTORS
10:30 am-5:00 pm *Alpine East (H)*

PROGRAM COMMITTEE
11:00 am-1:00 pm *150D (CC)*

INTERNATIONAL COLLABORATION COMMITTEE
1:00-3:00 pm *Topaz Room (H)*

ACCELERATOR SECTION BOARD OF DIRECTORS
5:00-6:00 pm *Topaz (H)*

Monday, 28 June 2010

NOMINATING COMMITTEE
Noon-3:00 pm *150F (CC)*

CHAPTER COUNCIL MEETING
1:00-2:00 pm *Ballroom A (CC)*

ANSI N320
1:00-4:00 pm *Topaz (H)*

ANSI HPS N13.14 WORKING GROUP
2:00-3:00 pm *Salon 3 (H)*

HPS SECTION COUNCIL MEETING
2:30-3:30 pm *251D (CC)*

HISTORY COMMITTEE
2:30-4:30 pm *Exec Boardroom (H)*

ANSI N13.1 REVISION WORKING GROUP
2:30-5:00 pm *Salon 2 (H)*

SCIENTIFIC AND PUBLIC ISSUES COMMITTEE
3:00-4:30 pm *President Dickson's Suite (H)*

Tuesday, 29 June 2010

RULES COMMITTEE
9:00-10:00 am *252A (CC)*

AAHP PROFESSIONAL DEVELOPMENT
10:00 am-Noon *252B (CC)*

LABORATORY ACCREDITATION POLICY AND ACCREDITATION COMMITTEES
10:00 am-2:00 pm *150F (CC)*

HP PROGRAM DIRECTORS ORGANIZATION
Noon-2:00 pm *Salon 2 (H)*

PUBLIC INFORMATION COMMITTEE
Noon-2:00 pm *252A (CC)*

ANSI N323 A&B
1:00-3:00 pm *252B (CC)*

GOVERNMENT AND SOCIETY RELATIONS COMMITTEE
1:30-3:30 pm *Exec Boardroom (H)*

CURRENT AND PROSPECTIVE CHAPTER OFFICERS TRAINING SESSION
2:30-4:00 pm *251D (CC)*

AAHP NOMINATING COMMITTEE
3:00-4:00 pm *252A (CC)*

ANSI N42.17 A&C COMMITTEE
3:00-5:00 pm *252B (CC)*

CSU RECEPTION - ALL ARE WELCOME
5:30-7:00 pm *Alpine East (H)*

Wednesday, 30 June 2010

ANSI N13.52
8:00 am-Noon *252B (CC)*

HPS N.13.3 DOSIMETRY FOR CRITICALITY ACCIDENTS
8:00 am-Noon *Salon 1 (H)*

ANSI/HPS N2.1 WORKING GROUP
9:00 am-Noon
Salon 2 (H)

DECOMMISSIONING SECTION BOARD MEETING
Noon-1:00 pm *Exec Boardroom (H)*

SCIENCE SUPPORT COMMITTEE
Noon-2:00 pm *252A (CC)*

MILITARY SECTION HPS, EXECUTIVE BOARD MEETING
Noon-2:00 pm *Topaz (H)*

STUDENT BRANCH MEETING
Noon-2:00 pm *Canyon B (H)*

SOCIETY SUPPORT COMMITTEE
Noon-3:00 pm *150F (CC)*

SUPPORT COMMITTEE ON STANDARDIZING RADIATION RISK
12:15-1:15 pm *252B (CC)*

MEMBERSHIP COMMITTEE
12:30-2:30 pm *Salon 3 (H)*

CONTINUING EDUCATION COMMITTEE
1:00-3:00 pm *251A (CC)*

STANDARDS/HPSSC MEETING
1:00-4:00 pm *Salon 1 (H)*

WEB EDITORS MEETING
1:00-5:00 pm *Salon 2 (H)*

ANSI N42.5X
1:30-4:00 pm *Canyon C (H)*

ACADEMIC EDUCATION COMMITTEE/AEC ACCREDITATION SUBCOMMITTEE
2:00-4:00 pm *252B (CC)*

ANSI N13.1 REVISION WORKING GROUP
2:30-5:00 pm *Topaz (H)*

HOMELAND SECURITY COMMITTEE
4:30-6:00 pm *Canyon B (H)*

Thursday, 1 July 2010

LOCAL ARRANGEMENTS COMMITTEE
7:30-9:30 am *150E (CC)*

ANSI N13.1 REVISION WORKING GROUP
9:00 am-Noon *Topaz (H)*

HPS BOARD OF DIRECTORS MEETING
11:00 am-5:00 pm *Canyon AB (H)*

PROGRAM COMMITTEE
12:30-3:00 pm *Salon 2 (H)*

55th Annual Meeting of the Health Physics Society

Salt Lake City, UT, 27 June - 1 July,

Scientific Program

Presenter's name is asterisked (*) if other than first author.

MONDAY

7:00-8:00 AM **251D**

CEL1 ABHP Exam Fundamentals – Tips for Successfully Completing the Certification Process

Cheryl Olson, Andy Miller, Patricia Milligan

Dominion KPS, Vanderbilt University, US NRC

7:00-8:00 AM **251E**

CEL2 Update on Medical Internal Radiation Dosimetry: MIRD Committee Recommendations for Unifying MIRD and ICRP Formulas, Quantities, and Units

Darrell R. Fisher, Wesley E. Bolch

Pacific Northwest National Laboratory, University of Florida

8:30 AM-Noon Ballroom E/F/G/H

Plenary: The Future of the Nuclear Industry

Chair: Howard Dickson

8:30 AM **Introduction**

Howard Dickson

President, HPS

Presentation of Distinguished Public Service Award to Peter Lyons

Richard Toohey, Past President, HPS

8:40 AM **PL.1**

Regulatory Prospective

Jaczko, G.

Chairman, US Nuclear Regulatory Commission

9:15 AM **PL.2**

Realities of US Nuclear Industry

Archie, J.

South Carolina Electric & Gas Company

9:50 AM **PL.3**

Radiation Protection Challenges

Harris, W.

Exelon

10:25 AM **BREAK**

10:45 AM **PL.4**

Global Energy Needs: Defining a Role for a "Right Sized Reactor"

Sanders, T. ***(Landauer Lecturer)***

ANS

11:20 AM **PL.5**

Human Resource Requirements

Berrigan, C.

Industry Infrastructure, NEI

Noon-1:00 PM **Exhibit Hall A**

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

1:00-3:00 PM **Exhibit Hall A**

P: Poster Session

Accelerator

P.1 Analysis of a Linear Particle Accelerator Using Radiochromic Film, Radiographic Film, and Activation Foils

Bond, J., Balzer, M., Harris, J.

Idaho Accelerator Center, Idaho State University

P.2 Preliminary Production of Cu-67 at Idaho State University using a Linear Particle Accelerator
Sinha, V., Harris, J., Wells, D.
Idaho State University, Idaho Accelerator Center

P.3 A Comparison of Optically Stimulated Luminescence, Thermoluminescence and Film Dosimetry at the Idaho Accelerator Center
Tormohlen, D., Harris, J., Balzer, M.
Idaho State University

Biokinetics/Bioeffects

P.4 Carbon-14 Metabolism in the Human Body
Masuda, T., Tako, Y., Nakamura, Y.
Institute for Environmental Sciences

P.5 Analysis of Mechanisms Underlying Development of Malignant Neoplasms in the Cohort of Nuclear Workers Employed at the Mayak Production Association
Guryanov, M.Y., Belosokhov, M.V., Rusinova, G.G., Glazkova, I.V., Azizova, T.V.
Southern Urals Biophysics Institute (SUBI), Ozyorsk

P.6 Analysis of Genomic Instability Transmission in Families of the Mayak Workers Based on Minisatellite Markers
Glazkova, I.V., Rusinova, G.G.
South Urals Biophysics Institute (SUBI), Ozyorsk

P.7 To Assess the Open Field Behaviour of Mice through Acute Exposure of Non-Ionizing Radiation by Wireless Communication Device/ Mobile Phone
Kumar, N., Khan, R.A.
Babasaheb Bhirao Ambedkar University, India

Decommissioning

P.8 RadBall: Position and Orientation Determination System (PODS)
Harpring, L., Gordon, J., Farfan, E., Foley, T., Jannik, G., Gladden, J., Stanley, S., Holmes, C.*
Savannah River National Laboratory, National Nuclear Laboratory

Emergency Planning/Response

P.9 A Real-Time Interaction GIS Management System for Environmental Survey
Fang, H.
Institute of Nuclear Energy Research

Environmental

P.10 Studies on Existence and Measurement of Radio Nuclides in the Lower Mississippi River Sediment Samples Collected in the South-West Mississippi Area
Harper, A., Winfield, T., Pittman, J., Heard, J., Gidi, M., Alemu, T., Franklin, C., Copper, C., Billa, J., Aciel, S.
Alcorn State University

P.11 Radioecology: Incorporating New Tools to Answer Complex Issues of Radioactivity in the Environment
Kuhne, W., Jannik, T., Farfan, E., Gladden, J.*
Savannah River National Laboratory

P.12 The Contribution of U-238 and Th-232 to Radiation Dose and Risk from Fly Ash Effluent of Coal-Fired Power Plants
Beckfield, F., Johnson, T.
Colorado State University

P.13 A Study of Strontium 89/90 Analysis Method in Environmental Monitoring
Lin, C.F., Wang, J.J., Chang, B.J., Chen, I.J., Chen, C.L., Wang, T.W.*
Institute of Nuclear Energy Research, Atomic Energy Council

External Dosimetry

P.14 A Comparison between PHITS and Geant4 Simulations of HZE Ion Interactions in an Aluminum Target
Cox, B.
Texas A&M University

P.15 INER's Study of New Personnel Dosimetry Performance Testing at 2009
Chen, C., Fang, H.
Institute of Nuclear Energy Research

P.16 Experimental Study using 142Pr Glass Eye Applicator for the Treatment of Eye Plaques in Large Animals
Vasudevan, L., Jung, J., Fisher, T., Reece, W., Walker, M.
Texas A&M University, Cooper University Hospital

Homeland Security

P.17 Using Urban Terrain Data for Monte Carlo Radiation Transport Calculations
Bergman, J., Millage, K., Madrigal, J.
ARA, Inc.

P.18 Assessment of Sr-90 and Cs-137 Penetration into Reinforced Concrete (Extent of 'Deepening') under Natural Atmospheric Conditions
Farfan, E., Gaschak, S., Maksymenko, A., Jannik, G., Marra, J., Bondarkov, M., Donnelly, E.*
Savannah River National Laboratory, Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology, International Radioecology Laboratory, Centers for Disease Control and Prevention

P.19 Assessment of Beta Particle Flux from Surface Contamination as a Relative Indicator for Radionuclide Distribution on External Surfaces of a Multistory Building in Pripyat
Farfan, E., Gaschak, S., Maksymenko, A., Jannik, G., Marra, J., Bondarkov, M., Donnelly, E.
Savannah River National Laboratory, Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology, International Radioecology Laboratory, Centers for Disease Control and Prevention

Instrumentation

P.20 Development of an On-line Radiation and Detection Measurements Lab Course
Kopp, D., DeVol, T.
Clemson University

Internal Dosimetry and Bioassay

P.21 Critical Evaluation of $^{239}PuO_2$ Wound and Lymph Node Retention Predicted by NCRP 156's Recommended Biokinetic Transfer Rates
Chelidze, N., Brey, R. R.
Idaho State University

P.22 A Monte Carlo Simulation of the In-Vivo Measurement of Lung Activity of the Lawrence Livermore National Laboratory Torso Phantom
Acha, R.M., Brey, R.R., James, A., Capello, K.
Idaho State University, USTUR, HML

P.23 Bayesian Analysis of Bioassay and Autopsy Data from 18-y Follow-up of an Acute Accidental Inhalation of Refractory PuO_2
Avtandilashvili, M., James, A., Birchall, A., Puncher, M., Gregoratto, D., Brey, R.
Idaho State University, US Transuranium and Uranium Registries, Health Protection Agency, UK

P.24 Dose Uncertainty Estimate from Tissue Composition Variation
Marsh, D., Caracappa, P.
Rensselaer Polytechnic Institute

Medical Health Physics

P.25 Experience with the EpiRad™ Device for Wet Macular Degeneration in a Clinical Trial
Evdokimoff, V.
Dade Moeller & Associates

P.26 Investigation of Patient Dose for Diagnostic Reference Level in Radiographic Examinations: National Survey in Korea
Kim, K., Kim, H., Lee, K., Kim, Y., Sung, D.
Kyung Hee University, National Institute of Food and Drug Safety Evaluation, Dong-A University, Chonnam National University

P.27 Radiation Dose from Coronary Artery Calcification Screening
Kim, K., Einstein, A., Berrington de Gonzalez, A.
Kyung Hee University, Columbia University, National Cancer Institute

P.28 Comparison of Computed Tomography Dose in an Anthropomorphic Phantom Using Optically Stimulated and Thermoluminescent Dosimetry
Gee, N., Verde, F., Brown, K.
Geisinger Health System, Penn State College of Medicine

P.29 Protocol for Integrity Test and Discard of Radiation Protective Gear
Soares, F., Pereira, A.
IF-SC

Military

P.30 Nuclear Medical Science Officers - Army Health Physicists: Leaders in Radiation Safety
Melanson, M., Bosley, W., Hamilton, D., Santiago, J., Chachian, A., Ortega, M.
Army Surgeon General, Army Public Health Command

Operational Health Physics

P.31 The Estimates of Skin and BFO Dose Rates, Dose Equivalent Rates and Accumulated Doses for Human Crews on the Surface of the Moon from 15 January 2005 Solar Energetic Particle Event using Earth-Moon-Mars Radiation Environment Module
PourArsalan, M., Townsend, L.W., Hall, M.I., Schwadron, N.A., Kozarev, K., Dayeh, M.A., Desai, M.I.
The University of Tennessee, Boston University, Southwest Research Institute

P.32 Validity of using RSAC 7 Computer Program to Determine Atmospheric Dispersion Factors
Schrader, J., Schrader, B.
Idaho State University, Idaho National Laboratory

P.33 Details of a Computer Code for Confidence Intervals when the Sample is Counted an Integer Times Longer than the Blank
Potter, W., Strzelczyk, J.
Consultant, Sacramento, University of Colorado Hospital

Regulatory/Legal

P.34 Radionuclide Emission Estimation for the Center of Advanced Energy Studies (CAES)
Holzmer, J., Schrader, B.
Idaho State University, Idaho State University

International

P.35 Internal Dosimetry of Ellipsoidal Targets: Models and Applications
Amato, E., Lizio, D., Campennì, A., Herberg, A., Baldari, S.
University of Messina, Italy

P.36 Determination of ^{210}Pb and ^{210}Po in Sea Water Samples for Dosimetric Studies and Radiation Protection Purposes
Arginelli, D., Badolato, F., Avataneo, O., Ridone, S.
Radiation Protection Institute, Italy, University of Turin, Italy,

P.37 Monitoring of Uranium in Environmental Samples by Means of Flow Techniques
Avivar, J., Ferrer, L., Casas, M., Cerdà, V.
University of the Balearic Islands, Spain

P.38 Evaluation of Viewing Conditions for Radiological Images in Five Hospitals of Uruguay
Blanco, D.
Montevideo, Uruguay, Universidad de la República

P.39 Assessment of Intake of Radionuclides from the Environment into a Human Body
Dimitrov, L.D.
NPP Kozloduy, Bulgaria

P.40 Behavior of a Parent Radionuclide and its Daughters in a Multi-Compartment System
Dimitrov, L.D.
NPP Kozloduy, Bulgaria

P.41 Software Application “DOSE ART” for Assessment of Inhalation Intake and the Relevant Committed Effective Dose of Internal Exposure
Valtchev, G.G., Dimitrov, L.D.
NPP – Kozloduy, Bulgaria

P.42 The Significance of Thyroid Cancer in Reactor Safety Assessment
Higson, D.
Retired; Fellow and Executive Committee Member of the Australasian Radiation Protection Society, Fellow of the Institution of Engineers, Australia

P.43 Estimation of Effective Dose for Different Age Groups from ^{137}Cs And ^{90}Sr due to Ingestion of Food and Drinking Water in Bosnia and Herzegovina
Ilic Z., Deljkic D., Vidic A.
Institute for Public Health of Federation of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina

P.44 NORM and Heavy Metals Partitioning during Water Treatment Processes
Khater, A.E.M.
King Saud University, Kingdom of Saudi Arabia, National Center for Nuclear Safety and Radiation Control, Atomic Energy Authority, Egypt

P.45 Uranium and Heavy Metals in Narghile (Shisha, Hookah) Moassel

Khater, A.E.M., Amr, M., Chaouachi, K.

King Saud University, Kingdom of Saudi Arabia, Atomic Energy Authority, Egypt, Nuclear Research Center, University of Paris XI-XII, France

P.46 NORM and Trace Elements Fractionation in Phosphate Rock Beneficiation Processes: Potential Hazardous and Useful Applications

Khater, A.E.M.

King Saud University, Kingdom of Saudi Arabia, Atomic Energy Authority, Egypt

P.47 Technologically Enhanced NORM and Heavy Metals in Iron and Steel Industry

Khater, A.E.M., Bakr, W.F.

King Saud University, Kingdom of Saudi Arabia, Atomic Energy Authority, Egypt

P.48 Could Cell Death Play an Important Role in Radon-Related Mutagenesis?

Madas, B.G., Balásházy, I., Farkas, A.

Hungarian Academy of Sciences KFKI Atomic Energy Research Institute, Hungary

P.49 Does the Effectiveness of BNCT Depend on the Size of Metastases?

Madas, B.G., Balásházy, I., Farkas, A.

Hungarian Academy of Sciences KFKI Atomic Energy Research Institute, Hungary

P.50 Assuring Diagnostic Quality Bounds of JPEG 2000 Compressed, High Resolution Magnetic Resonance Images Containing Lesions of Multiple Sclerosis or Virchow Robins Space Enlargements

Paz, J.E., Pérez, M., Miranda, I., Rodríguez, J., Schelkens, P.

Universidad Central "Marta Abreu" de las Villas, Cuba, Hospital Universitario "Arnaldo Milián Castro," Cuba, Vrije Universiteit Brussel, Belgium

P.51 Effect of Lossy Compression Over Head CT Image Quality at Low Doses: A Phantom Study

Pérez, M., Miranda, I., Estévez, E., Paz, J.E., Khoury, H.J., Andrade, M.E., Carvalho-Filho, A.E.

Central University of Las Villas, Cuba, Federal University of Pernambuco, Brazil

P.52 Implementation of Quality Assurance in Diagnostic Radiology in Madagascar

Ramanandraibe, M.J., Randriamora, T.H., Randriantsizafy, R.D., Andriambololona, R.

Madagascar INSTN (Institut National des Sciences et Techniques Nucléaires), Madagascar

P.53 Evaluation of Preclinical Model Use in Metabolic Radiotherapy and Imaging, with Particular Consideration to [153SM]SM-EDTMP and Iodine Isotopes

Ridone, S., Arginelli, D., Miranti, A., Vigna, L.

ENEA-Italian National Agency for New Technologies, Italy, University of Turin, Italy, Hospital "Maggiore della Carità" of Novara, Italy

P.54 Determination of Water-to-Biota Concentration Ratios and Sediment-Water Distribution Coefficients of Stable Elements in Japanese Estuarine Areas
Takata, H., Tagami, K., Aono, T., Uchida, S.
National Institute of Radiological Sciences, Japan

P.55 Investigating Radioactive Properties of Incense
Alrefae, T., Nageswaran, T.N., Al-Failakawi, A., Al-Shemali, T.
Kuwait University, Kuwait

P.56 Soil-to-Plant Transfer Factor Database in Japan – Use of Stable Elements as Analogues of Radionuclides
Uchida, S., Tagami, K., Ishikawa, N.
National Institute of Radiological Sciences, Japan

P.57 Estimation of Radionuclides Atmospheric Dispersion in Vicinity of Coal Power Plant Kakanj
Vidic, A., Ilic, Z., Deljkic, D., Adrovic, F.
Institute for Public Health of Federation of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina, University of Tuzla, Tuzla, Bosnia and Herzegovina

P.58 Practical X-Ray Alternative to Self-Shielded Gamma Irradiators
Mehta, K.
Arbeiterstrandbad Strasse, Austria

Works-in-Progress

P.59 Regulatory Research in Radiation Protection, U.S. Nuclear Regulatory Commission
Bush-Goddard, S.
US Nuclear Regulatory Commission

P.60 Estimation of Entrance Surface Doses (ESDs) for Common Medical X-Ray Diagnostic Examinations in Radiological Departments in Mashhad-IRAN
Esmali, S., Taghi, M., Toossi, B.
Mashad University of Medical Sciences, Iran

P.61 MCNP Simulating OSL Ring Response Matrix for X-Ray Spectrums
Xia, Z., Salasky, M.
Landauer, Inc.

P.62 Design And Simulation of a Passive-Scattering Nozzle in Proton Beam Radiotherapy
Guan, F., Poston, J., Braby, L.
Texas A&M University

P.63 Radiographic Imaging of a Low-Z Sample Using Laser Compton Scattered X-Rays
Naeem, S., Chouffani, K., Wells, D.
Idaho State University, Pocatello

P.64 Application of Probabilistic RESRAD-BIOTA Code in the IAEA EMRAS II Biota Working Group's Beaverlodge Scenario
Kamboj, S., Yu, C., LePoire, D., Klett, T., Cheng, J.-J., Normandy, J., Williams, W.A., Domotor, S., Wallo, A.
Argonne National Laboratory, US Department of Energy

P.65 PIMAL: A GUI for Enabling Radiation Dose Assessment Using Phantoms with Realistic Postures
Akkurt, H., Wiarda, D., Eckerman, K.
Oak Ridge National Laboratory

P.66 Evaluation of Uranium Chemical and Radio-Toxicity in the Workplace for Bioassays
Meck, R., Leggett, R.W., Eckerman, K.F., McGinn, C.W.
Science and Technology Systems, LLC, Oak Ridge National Laboratory

3:00-5:00 PM Ballroom A

MPM-A: Instrumentation

Co-Chairs: Wayne Gaul, Karen Barcal

3:00 PM MPM-A.1
Calibration of the Holdup Measurement System 4 (HMS4) for Lower Enriched Uranium (LEU) Holdup Measurements Using a Surrogate Bi-207 Source
Jadick, M., Riley, W., Estes, B.
ORISE

3:15 PM MPM-A.2
Unique Radiation Detection Method Using Si based Integrated Circuits
Marianno, C., Khatri, S.
Texas A&M University

3:30 PM MPM-A.3
Experimental Dose Results of a Prototypic Skin Dosimeter
Cazalas, E., Hamby, D., Farsoni, A.
Oregon State University

3:45 PM MPM-A.4
A Comparison of the Stated Performance of Various Radon Measurement Instruments and Techniques
Riccardi, A., Johnson, T.
Colorado State University

4:00 PM MPM-A.5
Specialized Measurements for a Homeland Security Project
Stansbury, P., Sandness, G., Schweppe, J., Todd, L., Woodring, M., Murphy, L.
Pacific Northwest National Lab, US Department of Homeland Security, Domestic Nuclear Detection Office

4:15 PM MPM-A.6
Energy Calibration of Beta Particle Spectrometers with Active Gamma-Ray Discrimination Capability
Higginbotham, J.F.
Oregon State University

4:30 PM MPM-A.7
Application of Two New Portable Gamma Spectrometry Systems for Monitoring Environmental Radioactivity
Yorks, P.J., Fallahian, N., Simpson, D.R.
Bloomsburg University, Pennsylvania

4:45 PM MPM-A.8
Neutron Metrology Data Supporting the Use of a Neutron Pager for Dose Rate Measurements and as an Active Personal Warning Dosimeters
Iwatschenko, M., Taylor, G., Thomas, D.
Thermo Fisher Scientific, National Physical Laboratory

3:00-4:15 PM Ballroom B

MPM-B1: Waste Management

Co-Chairs: Jay Tarzia, Michael Benjamin

3:00 PM MPM-B1.1

Development of Authorized Limits for Disposal of PCB Capacitors from Buildings 361 and 391 at Argonne National Laboratory, Argonne, Illinois

Cheng, J., Chen, S., Brachmann, N., Butala, S., Brumwell, F.
Argonne National Laboratory

3:15 PM MPM-B1.2

A Standardized Approach for Low Level Waste Quantification at the Texas A&M University Nuclear Science Center using Gamma Spectroscopy and ISOCS Mathematical Calibration Software

Vasudevan, L., Dugan, K., Tijerina, A.
Nuclear Science Center, Texas A&M University

3:30 PM MPM-B1.3

Results of Direct Gamma Radiation Measurements Over Completed Low-Level Radioactive Waste Trenches

Benjamin, M.
EnergySolutions

3:45 PM MPM-B1.4

Field Gamma Spectroscopic Characterization of Low Level Waste Drums Containing U-233 and U-232

Meyer, K.
Canberra

4:00 PM MPM-B1.5

Assessment of the Potential for Building a Low Level Radioactive Waste Facility in Northern Louisiana

Wilson IV, C., Wang, W.
Louisiana State University

4:30-5:15 PM Ballroom B

MPM-B2: Biokinetics and Bioeffects

Co-Chairs: Ray Guilmette, Mike Noska

4:30 PM MPM-B2.1

Radiation Biodosimetry via Magnetic Resonance Spectroscopy at 3T?

Huda, A., Ramadan, S., Nagarajan, R., Thomas, M.A.
California State University, Fresno, Brigham & Women's Hospital, Boston, University of California, Los Angeles

4:45 PM MPM-B2.2

Comparison of Two F-18 FDG Biokinetic Models for the Estimate of Patient Dose from PET Imaging

Su, L., Mille, M., Xu, X.G., Stabin, M.
Rensselaer Polytechnic Institute, Vanderbilt University

5:00 PM MPM-B2.3

No Linear-No-Threshold Cancer Risk Model Applies to Protracted Ionizing Radiation Exposures

Raabe, O.G.
University of California, Davis

3:00-5:30 PM Ballroom C

MPM-C: Power Reactor Section Special Session Nuclear Power Health Physics 2010

Co-Chairs: Laura Pring, David Ethridge, Roger Shaw

3:00 PM MPM-C.1

The Resurgence of Nuclear Energy and Evolving Radiation Protection Challenges - A U.S. Perspective

Andersen, R.
Nuclear Energy Institute

3:30 PM **MPM-C.2**
Health Physics Concerns in Commercial Nuclear Fuel Fabrication
Mabry, A.
Global Nuclear Fuel -Americas, LLC

4:00 PM **MPM-C.3**
A Current Perspective on Managing the Back End of the Commercial Nuclear Fuel Cycle in the United States
Sowder, A.G.
EPRI

4:30 PM **MPM-C.4**
Realignment of the Nuclear Regulatory Commission's Reactor Oversight Process Radiation Safety Baseline Inspection Procedures
Pedersen, R.
Office of Nuclear Reactor Regulation, US NRC

5:00 PM **MPM-C.5**
Addressing the RP Technician Shortage-Fall 2009
Hiatt, J.
BHI Energy

3:15-4:15 PM **Ballroom D**

MPM-D: Contemporary Topics in Health Physics

Co-Chairs: Ken Krieger, Martha Dibblee

3:15 PM **MPM-D.2**
Public Perspective of Risk
Howard, B.
Retired

(Order of presentations switched at Presenter's request)

3:30 PM **MPM-D.4**
Texas Efforts to Increase Nuclear Technology Workforce
Krieger, K., Morris, L.
Texas State Technical College

3:45 PM **MPM-D.3**
Nuclear Engineering and Radiation Safety Education and Research at Prairie View A&M University
Vasudevan, L., Aghara, S. K
Prairie View A&M University

4:00 PM **MPM-D.5**
Using "Science Cafès" as a Communication Tool for the HPS
Dibblee, M.
Consultant

3:00-4:45 PM **150 ABC**

MPM-E: Board of Laser Safety Special Session

Co-Chairs: Myungchul Jo, Dewey Sprague

3:00 PM **MPM-E.1**
What Health Physics Should Know about Laser, Laser Safety and Why
Barat, K.
Lawrence Berkeley National Laboratory

3:30 PM **MPM-E.2**
Radiation Safety across the Electromagnetic Spectrum - The Challenges of the National Ignition Facility
*Beale, R., King, J., Sprague, D.**
Lawrence Livermore National Laboratory

4:00 PM **MPM-E.3**
Expected Revisions of Laser Maximum Permissible Exposure Limits
Sliney, D.
Consultant

4:30 PM **MPM-E.4**
The Board of Laser Safety's Certified Laser Safety Officer Program
Edwards, B., Sams, B.
Duke University Medical Center

3:00-4:00 PM **150 G**

MPM-F: GTRI/NNSA Special Session

Chair: William Rhodes

3:00 PM **MPM-F.1**

Wake Forest University Baptist Medical Center Experience with the Global Threat Reduction Initiative

Howell, D.

Wake Forest University

3:15 PM **MPM-F.2**

Implementation of Radiological Material Security Enhancements at Rutgers University and the University of Medicine and Dentistry of New Jersey

McDermott, P.J., McCluskey, B., Pelletier, J.F.

Rutgers, The State University of New Jersey, University of Medicine and Dentistry of New Jersey, Sandia National Laboratories

3:30 PM **Panel Discussion**

TUESDAY

7:00-8:00 AM **251D**

CEL3 ANSI N43.1 Standard Draft: Radiation Safety for the Design and Operation of Particle Accelerators

James C. Liu, Lawrence S. Walker
SLAC, LANSCE, Los Alamos National Laboratory

7:00-8:00 AM **251E**

CEL4 Overdose of Patients Receiving CT Scans

Thomas L. Morgan
University of Rochester

8:30-11:30 AM **Ballroom A**

TAM-A: External Dosimetry I

Co-Chairs: Robin Hill, Derek Jokisch

8:30 AM **TAM-A.2**

Neutron Conversion Coefficients for Extremities

Veinot, K.G., Burgett, E.M.
Y-12 National Security Complex, Georgia Institute of Technology

8:45 AM **TAM-A.3**

Specific Absorbed Fractions for Protons in the Human Skeleton

Jokisch, D., Bahadori, A., Rajon, D., Bolch, W.
Francis Marion University, University of Florida

9:00 AM **TAM-A.4**

The Effects of KAC WSI Kevlar Security Vests on Thermoluminescent Neutron Dosimeters (TLNDs)

Gause, S.M., Wagoner, D.A.
Savannah River Nuclear Solutions, Texas A&M University

9:15 AM **TAM-A.5**

Development and Evaluation of a Neutron Sensitive Memory Chip

Sax, K.J. , Nelson, M.E., Ziegler, J.F., Cameron, C.B., Avramov-Zamurovic, S., Hughes, H.L., McMarr, P.J.
US Naval Academy, Naval Research Laboratory

9:30 AM **Break in Exhibit Hall**

10:00 AM **TAM-A.6**

Neutron Metrology Resources in the UK Using Monoenergetic and Simulated Workplace Fields from Thermal to 20 MeV

Taylor, G.C., Bennett, A., Cheema, S.S., Hawkes, N.P., Horwood, N.A., Kolkowski, P., Roberts, N.J., Thomas, D.J.
National Physical Laboratory, United Kingdom

10:15 AM **TAM-A.7**

An Evaluation of Methods to Correct Historic NTA Film Dosimeters

Taulbee, T., Mahathy, J., DeBord, G.
NIOSH, ORAU, SRA

10:30 AM **TAM-A.8**

A Review of Personal and Ambient Dose Equivalent

Hertel, N.E., Veinot, K.G.
Georgia Institute of Technology, Y-12 National Security Complex

10:45 AM **TAM-A.9**

Direct Ion Storage - Revolutionizing Radiation Monitoring Programs

Bennett, K.E., Perle, S.C., Kahilainen, J., Voutila, M.
Mirion Technologies

11:00 AM TAM-A.10
Revised Compartment Factors Calculating Effective Dose from Multiple Dosimetry
Hill, R., Rathbone, B.
Pacific Northwest National Laboratory

11:15 AM TAM-A.11
Micro Fricke Dosimeters Composed of Cation Exchange Resin Beads
Bauhs, J.A., Hammer, B.E., Higgins, P.D.
3M Company, University of Minnesota

8:15 AM-Noon Ballroom B

TAM-B: Environmental I

Co-Chairs: Michael Schierman, Matthew Barnett

8:15 AM TAM-B.1
On-line Detection and Monitoring of Radioactive Iodine in Water through the Use of Extractive Scintillating Resin
Grogan, K., DeVol, T., Powell, B., Lee, C., Husson, S.
Clemson University

8:30 AM TAM-B.2
Radon Flux from Evaporation Ponds Containing Elevated Concentrations of Radium-226
Simonds, M.H., Schierman, M.J., Baker, K.R.*
Environmental Restoration Group

8:45 AM TAM-B.3
Development of Alternative Methods for Quantification of Polonium-210 in Water
Matheny, T.E., DeVol, T.A.
Clemson University

(Order of presentations switched at Session Chair's request)

9:00 AM TAM-B.5
Meeting Radionuclide Air Emissions Sampling Requirements for Temporary Sources under the Clean Air Act
Fuehne, D., Martinez, H., Moore, M.
Los Alamos National Laboratory

9:15 AM TAM-B.4
Verifying a Universal Design for Single Point Exhaust Stack Sampling
Moore, M., Fuehne, D., Schafer, D.
Los Alamos National Laboratory

9:30 AM TAM-B.6
A Comparison of Building Wake Effect Models
Simpkins, A. A.
Dade Moeller & Associates

9:45 AM Break in Exhibit Hall

10:15 AM TAM-B.7
Land and Water Use Characteristics and Usage Parameters around the Savannah River Site
Jannik, G., Farfan, E., Foley, T., Lee, P., Karapatakis, D.
Savannah River National Laboratory

10:30 AM TAM-B.8
Lessons Learned in DU Environmental Cleanup
Miller, M.
Sandia National Laboratories

10:45 AM TAM-B.9
Characterizing Biomass Accumulation Dynamics in Uranium Bioremediation by Principal Component Analysis
Dong, H., Johnson, T.
Colorado State University

11:00 AM TAM-B.10
NCRP Dose Pie Chart - Creation, Decline, and Restoration
Moeller, D.W.
Dade Moeller & Associates

11:15 AM **TAM-B.11**
Study of Presence & Concentration of Radionuclides in Farm Raised Catfish in the State Mississippi (MS)
Aceil, S., Billa, J.
Alcorn State University

11:30 AM **TAM-B.12**
Trends in Groundwater Chemistry Pre- and Post-Remediation at Irigaray and Grover In-Situ Uranium Mines
Roche, N., Johnson, T.
Colorado State University

11:45 AM **TAM-B.13**
Gamma Radioactivity Concentrations in Surface Soils of Guadalupe and Zacatecas Municipalities
Mireles, F., Flores, F., Pinedo, J., Dávila, J., Rìos, C., López, H., Saucedo, S.
Universidad Autonoma de Zacatecas, Mexico

8:30 AM-Noon **Ballroom C**

TAM-C: AAHP Special Session I - Radiation Dose Reconstruction for Epidemiology

Co-Chairs: Richard Vetter, Marina Degteva

8:30 AM **Introduction**
Introductory Remarks and Overview
Rich Vetter, Dan Strom
Mayo Clinic, Pacific Northwest National Laboratory

8:35 AM **TAM-C.1**
The Needs of a “Customer” of Dose Reconstruction
Gilbert, E.S.
National Cancer Institute

8:55 AM **TAM-C.2**
Radiation Dose Reconstruction: Principles and Practices - A New NCRP Report
Napier, B.A.
Pacific Northwest National Laboratory

9:15 AM **TAM-C.3**
Errors and Uncertainties in Radiation Dose Reconstruction for Epidemiology: Approaches and Challenges
Strom, D.J.
Pacific Northwest National Laboratory

9:30 AM **TAM-C.4**
Skeletal Dose Estimates for Radium Dial Workers
Toohey, R.E.
ORAU

9:45 AM **TAM-C.5**
Radon and Uranium Miner Dosimetry: Current Status and Uncertainties
James, A.C.
WSU/USTUR

10:00 AM **Break in Exhibit Hall**

10:30 AM **TAM-C.6**
Uncertainty in Dose Reconstruction for the Atomic Bomb Survivors in Hiroshima and Nagasaki
Cullings, H.M.
Radiation Effects Research Foundation, Hiroshima, Japan

11:00 AM TAM-C.7
The 15-Country Nuclear Workers Study - Quantification of Errors in Doses
Thierry-Chef, I., Marshall, M., Fix, J.J., Cardis, E., Bermann, F., Gilbert, E., Hacker, C., Heinmiller, B., Moser, M., Pearce, M.S.
IARC, Consultant, Dade Moeller & Associates, CREAL, NCI, AECL, Bundesamt für Gesundheit, University of Newcastle

11:30 AM TAM-C.8
Radiation Organ Doses Received by U.S. Radiologic Technologists: Estimation Methods and Findings
Simon, S.L.
National Cancer Institute

11:45 AM TAM-C.9
Dosimetry for NCI Chornobyl Studies (Thyroid Diseases)
Bouville, A., Drozdovitch, V., Luckyanov, N., Voillequè, P.G.
National Cancer Institute, National Institutes of Health, MJP Risk Assessment

8:30-11:30 AM Ballroom D

TAM-D: Decommissioning

Co-Chairs: Scott Hay, Jerry Cooper

8:30 AM TAM-D.1
The "MARSSIM Survey" and the Radiation Survey and Site Investigation Process
Hansen, T.
Ameriphysics

8:45 AM TAM-D.2
Deriving Site-Specific Building DCGLs
Downey, H., Lively, J.
MACTEC

9:00 AM TAM-D.3
Evaluation of Innovative Technology for Decontamination of Contaminated Surfaces using Tc-99m Tagged Resin Powder
Dua, S., Lagos, L., Calderin, D., Ngachin, M., Colon Mendoza, R.
Florida International University

9:15 AM TAM-D.4
Humboldt Bay Power Plant Decommissioning Challenges
Barley, W., Albers, J.
RosBar Enterprises, Inc., Pacific Gas & Electric

9:30 AM Break in Exhibit Hall

10:00 AM TAM-D.5
Activation Calculations to Support the Decommissioning of SEFOR
Hertel, N.E., Burgett, E.A., Shult, R.
Private Consultant, EnergySolutions

10:15 AM TAM-D.6
Development of a Portable, Field, Alpha and Photon Spectrometer for the Clearance of Property with Contaminated Surfaces
Millsap, W., Pappin, J., Balmer, D., Glines, W.
Dade Moeller & Associates, Mission Support Alliance, Pacific Northwest National Laboratory, Department of Energy

10:30 AM TAM-D.7
RadBall Deployment into a Shielded Cell at Savannah River National Laboratory
Farfan, E., Foley, T., Jannik, G., Gladden, J., Stanley, S., Holmes, C., Oldham, M., Adamovics, J.
Savannah River National Laboratory, National Nuclear Laboratory, Duke University, Heuris Pharma

10:45 AM **TAM-D.8**
Partial Site Release as Part of Decommissioning
Downey, H., Conant, J.
MACTEC, ABB

11:00 AM **TAM-D.9**
Selection of Radionuclides for Radiological Survey and Risk Assessment at the Santa Susana Field Laboratory Area IV
Rucker, T. L.
Science Applications International Corporation

11:15 AM **TAM-D.10**
Use All Radioanalytical Laboratory Results
Cherry, R.
US Army Installation Management Command

8:15-9:45 AM **150 ABC**

TAM-E: Reactor Health Physics

Co-Chairs: John Poston, Latha Vasudevan

8:15 AM **TAM-E.1**
Radionuclides Associated with Decommissioning of a Research Reactor
Beckman, J.
US Army Corps of Engineers

8:30 AM **TAM-E.2**
Dose Modeling for New Reactors Using ICRP-72 Dose Factors - NRCDose 72
DeMore, D.M., Bland, J.S., Malafeew, V.
Chesapeake Nuclear Services

8:45 AM **TAM-E.3**
Tritium Recapture Due to Rain and Snow at a Nuclear Power Plant
Hinchcliffe, W., Harris, J., Miller, D.
Idaho State University, University of Illinois

9:00 AM **TAM-E.4**
Atmospheric Dispersion of Radionuclide and Radiation Dose Calculation following a Hypothetical Accident Condition from Texas A&M University TRIGA Research Reactor
Vasudevan, L.
Texas A&M University

9:15 AM **TAM-E.5**
Investigation of Bacteria Bioaccumulation of Carbon-14 on the Glycol Piping in Pressurized Water Reactor Containment Buildings
Hawkley, G.H., Harris, J.T., Miller, D.W.
Idaho State University

9:30 AM **TAM-E.6**
ALARA Methods Incorporated into the Design of the AP1000
Slobe, E. D.
Westinghouse

9:45 AM **Power Reactor Section Business Mtg**

8:30-11:45 AM **150 G**

TAM-F: Accelerator Section Special Session I - Light Sources and FELs

Co-Chairs: Linnea Wahl, Kamran Vaziri

8:30 AM **TAM-F.1**
Light Sources, Free-Electron Lasers and the Accelerator Special Sessions
Grissom, M.P.
MPG—HP, Inc.

8:45 AM **TAM-F.2**
The BNL National Synchrotron Light Sources
Casey, W.R. ***(Dade Moeller Lecturer)***
NSLS-II BNL

9:45 AM **TAM-F.3**
Radiation Shielding and Radiation Protection Issues at the European Synchrotron Radiation Facility
Berkvens, P.
European Synchrotron Radiation Facility

10:00 AM **Break in Exhibit Hall**

10:30 AM **TAM-F.4**
Lasers and Laser Safety's Role in Accelerator Facilities
Barat, K.
LBNL

11:00 AM **TAM-F.5**
Advanced Laser Personnel Safety System at Jefferson Lab
Benson, S.V., Jordan, K.
Thomas Jefferson National Accelerator Facility

11:15 AM **TAM-F.6**
Radiation Safety Aspects of the Linac Coherent Light Source at SLAC
Rokni, S.H., Liu, J.C., Mao, X.S., Prinz, A.A., Leitner, M.S., Vollaire, J.
SLAC National Accelerator Laboratory

11:45 AM **Accelerator Section Business Meeting**

2:45-5:15 PM **Ballroom A**

TPM-A: External Dosimetry II

Co-Chairs: Tom Waters, Stephen Egbert

2:45 PM **TPM-A.1**
Optically Stimulated Luminescence Dosimetry with Human Tooth Enamel: Possibilities and Limitations for Retrospective Dosimetry
Sholom, S., DeWitt, R., Simon, S.L., Bouville, A., McKeever, S.W.S.
Oklahoma State University, National Cancer Institute, National Institutes of Health

3:00 PM **TPM-A.2**
Dose Reconstruction: Nonuniform Skin Dose from Exposure to Arsenic-73
Waters, T.L., Bertelli, L., Bland, J.R., Justus, A.L., Stallard, A.M., Walker, L.S.
Los Alamos National Laboratory

3:15 PM **TPM-A.3**
Post Event As-74 Measurements
Walker, L.S., Duran, M., Salazar, J., Martinez, M., Justus, A., Thorn, D., Fassbendern, M., Taylor, W.
Los Alamos National Laboratory

3:30 PM **TPM-A.4**
City- and Range-specific Effects on the Energy Spectra of Air-Transported Neutrons and Gamma Rays at Hiroshima and Nagasaki
Egbert, S., Kerr, G., Cullings, H., Funamoto, S.
Science Applications International Corporation, Kerr Consulting, Radiation Effects Research Foundation, Hiroshima

3:45 PM **Break in Exhibit Hall**

4:15 PM **TPM-A.5**

Energy Spectra of the Shielded and Organ Fluences of Neutrons and Gamma Rays Calculated by Dosimetry System DS02 for Atomic Bomb Survivors in Hiroshima and Nagasaki

Cullings, H.M., Kerr, G.D., Egbert, S.E., Funamoto, S.

Radiation Effects Research Foundation, Kerr Consulting Co., Scientific Applications International Corporation

4:30 PM **TPM-A.6**

Monte Carlo Modeling of a Sitting Phantom for Improved Environmental Dose Assessment

Han, B., Na, Y.H., Caracappa, P.F., Xu, X.G.

Rensselaer Polytechnic Institute

4:45 PM **TPM-A.7**

Dosimetry and Partial Body Irradiation of Mice

Pedersen, C., Ray, F.R., Johnson, T.E.

Colorado State University

5:00 PM **TPM-A.8**

Thermoluminescence Response of Ge- and Al-doped SiO_2 Optical Fibres to 7, 10 and 14 MeV Electron Irradiations

Khudzari, J.M.D., Wagiran, H.

Universiti Tun Hussein Onn Malaysia, Universiti Teknologi Malaysia

2:15-3:00 PM **Ballroom B**

TPM-B1: Environmental II

Co-Chairs: Michael Schierman, Matthew Barnett

2:15 PM **TPM-B1.1**

Concentration and Vertical Profile of Cs-137 in the Undisturbed Soil of Southwestern Nigeria

Ajayi, I.

Adekunle Ajasin University, Nigeria

2:30 PM **TPM-B1.2**

Measurement of Radioactive Content from Naturally Occurring Radioactive Material (NORM) in Abandoned Mine Tailings

Rahman, N.M., Zhang , W., Baweja, A., Atiya, I.A., Tracy, B.L.

Radiation Protection Bureau, Health Canada, Canada, University of McMaster, Canada

2:45 PM **TPM-B1.3**

Determination of Heavy Metals in Hair of Sanitation Workers Using the Method of Energy Dispersive X-Ray Fluorescence

Khudzari, J.M.D., Ibrahim, N., Wagiran, H., Agam, M.

Universiti Tun Hussein Onn Malaysia, Universiti Teknologi Malaysia

3:00 PM **Break in Exhibit Hall**

3:30-5:30 PM **Ballroom B**

TPM-B2: NESHAPs Radioactive Air Meeting

Co-Chairs: Matthew Barnett, Gus Vazquez

2:30-5:15 PM Ballroom C

TPM-C: AAHP Special Session II - Radiation Dose Reconstruction for Epidemiology

Co-Chairs: Richard Vetter, Dan Strom

(Order of presentations changed at Session Chair's request)

2:30 PM TPM-C.3
Bayesian Methods and Uncertainty for Internal Dose Reconstruction
Birchall, A., Puncher, M.
HPA, UK

3:00 PM TPM-C.2
Plutonium Dose Reconstruction for Workers at the Mayak Production Association
Khokhryakov, V.V., Romanov, S.A., Suslova, K.G., Khokhryakov, V.F., Vvedensky, V.E., Vostrotin, V.V.
Southern Urals Biophysics Institute

3:30 PM Break in Exhibit Hall

4:00 PM TPM-C.1
Reconstruction of External Radiation Doses for the Mayak PA Workers
Scherpelz, R.I.
Pacific Northwest National Laboratory

4:20 PM TPM-C.4
Dosimetry for the Extended Techa River Cohort
Degteva, M.O. **(G. William Morgan Lecture)***, Tolstykh, E.I., Vorobiova, M.I., Shagina, N.B., Anspaugh, L.R., Napier, B.A.*
Urals Research Center for Radiation Medicine, Russia, University of Utah, Pacific Northwest National Laboratory

4:50 PM TPM-C.5
Differences between Radiation Dose Reconstructions used in Support of Compensation Program Decisions and Those of Epidemiological Studies
Neton, J.W.
NIOSH

5:05 PM Wrap-Up
Dan Strom, Marina Degteva

5:15 PM AAHP Open Meeting

2:30-5:30 PM Ballroom D

TPM-D: Decommissioning Section Special Session

Co-Chairs: James Berger, David Ottley

2:30 PM TPM-D.1
Status Report on the Revision to the Surface and Volume Clearance Standard ANSI/HPS N13.12
Kennedy, Jr., W.E.
Dade Moeller & Associates

3:00 PM TPM-D.2
Orphan Sources and Radioactively Contaminated Material in the Metal Recycling Industry
Rowat, J.H., Reber, E.H., Ljubenov, V.
IAEA, Vienna

3:30 PM Break in Exhibit Hall

4:00 PM TPM-D.3
States Regulations, Practices and Advances in Clearance of Materials and Equipment from Licensed Sites, TENORM Sites, and Decommissioning Sites
Egidi, P., Shearer, D.
CDPHE/CRCPD, PADEP/CRCPD

4:30 PM **TPM-D.4**
Status of Department of Energy Management of the Clearance of Materials and Equipment from Department of Energy Sites
Wallo III, A., Anderson, A., Regnier, E., Vázquez, G.*
Department of Energy

5:00 PM **TPM-D.5**
What is MARSAME and How It Can Improve the Process for Conducting Radiological Disposition Surveys
*Buchholz, M.A., Moroney, W.R.**
ORAU

2:30-5:15 PM **150 ABC**

TPM-E: Homeland Security

Co-Chairs: Armin Ansari, Ronald Goans

2:30 PM **TPM-E.1**
Global Nuclear Detection Architecture (GNDA)
Passow, R.P., Albert, T., Zabko, J., Wittrock, M.
Department of Homeland Security/ DNDO

2:45 PM **TPM-E.2**
Deconstruction of Drums Containing IAEA Conditioned Sealed Sources
Tompkins, J.A.
Los Alamos National Laboratory-OSR Project

3:00 PM **TPM-E.3**
Use of Swipe Samples in Response to a Radiological or Nuclear Incident of National Significance
Griggs, J., Bassin, N.J., Berne, A., Burns, D., Gogolak, C.V., Litman, R., McCurdy, D.E., Shannon, R.*
US Environmental Protection Agency, NAREL, Environmental Management Support,

3:15 PM **TPM-E.4**
An Alternative Approach to Operational Risk Management for Radiation Emergencies
Daxon, E., Cuellar, J.
Battelle Memorial Institute, Uniformed Services University of the Health Sciences

3:30 PM **Break in Exhibit Hall**

4:00 PM **TPM-E.5**
Ultrasound Tissue Characterization of Local Radiation Injury
Goans, R., Sugarman, S., Christensen, D.
REAC/TS, MJW Corporation

4:15 PM **TPM-E.6**
IP Radiation Security: Networking Technologies Enabling Better Response
Reynolds, K.
IP Radiation Security Associates

4:30 PM **TPM-E.7**
An Approved, Affordable, Appropriate Action to Alleviate Anxiety
Brodsky, A., Crowe, F., Stangler, M.J.
Georgetown University, Crowe and Co, LLC, Consultant, Vienna, VA

4:45 PM **TPM-E.8**
Promoting the Use of Volunteer Radiation Professionals in Local and State Emergency Response Planning
Ansari, A., McBurney, R.
Centers for Disease Control and Prevention, Conference of Radiation Control Program Directors

5:00 PM **TPM-E.9**

Golden Guardian 2010: Multi-Agency Full Scale Exercise Involving RDDs

Papin, P., Welty, B., Spero, K., Nelson, R.

San Diego State University

2:30-5:00 PM **150 G**

TPM-F: Accelerator Section Special Session II - Light Sources and FELs

Co-Chairs: Mike Grissom, Henry Kahnhauser

2:30 PM **TPM-F.1**

Experiences at SSRL from Commissioning and Operation under Top-Off Injection and with Higher Stored Currents

Bauer, J.M., Liu, J.C., Prinz, A.A., Rokni, S.H.

SLAC National Accelerator Laboratory

2:45 PM **TPM-F.2**

Upgrade Challenges at a 2nd Generation Light Source

Marceau-Day, M.

LSU/CAMD

3:00 PM **TPM-F.3**

The Review and Approval Process of Radioactive Material Experiments at Stanford Synchrotron Radiation Lightsource (SSRL) at SLAC National Accelerator

Campos Torres, M.M., Allan, J., Morris, C.A., Padilla, M.T., Rokni, S.H.

SLAC National Accelerator Laboratory

3:15 PM **TPM-F.4**

Dose Calculations using EGS4 for the Canted Undulator, 12-ID Beamline at the Advanced Photon Source

Dooling, J.C., Emery, L.

Argonne National Laboratory

3:30 PM **Break in Exhibit Hall**

4:00 PM **TPM-F.5**

LANL As-73/74 Extremity Exposure Events

Walker, L.S., Duran, M., Martinez, M.L., Salazar, J., Ortega, P.

Los Alamos National Laboratory

4:15 PM **TPM-F.6**

Public Air Dose Estimate Comparison between National Council on Radiation Protection and Monte Carlo N-Particle Extended Methods for an Open Installation Linear Accelerator up to 60 MeV

Sandvig, M., Sterbentz, J.

Idaho National Laboratory

4:30 PM **TPM-F.7**

First Use of the Fission Fragment Ion Source

Baker, S., Moore, E., Pardo, R., Savard, G.

Argonne National Laboratory

4:45 PM **TPM-F.8**

Protocols for the Unrestricted Release of Metals at SLAC

Sabourov, A., Allan, J., Fasso, A., Liu, J., Ligeti, O., Rokni, S., Vollaire, J., Yamanishi, H.

SLAC National Accelerator Laboratory, National Institute for Fusion Science

Don't forget the **Awards Banquet**
7:00-9:00 pm, Hilton Grand Ballroom

WEDNESDAY

7:00-8:00 AM **251D**

CEL5 Radiological Releases and Environmental Monitoring at Commercial Nuclear Power Reactors

Jason Harris

Idaho State University

7:00-8:00 AM **251E**

CEL6 Dose Reconstruction for Radiation Epidemiology

Daniel J. Strom

Pacific Northwest National Laboratory

8:45-11:00 AM **Ballroom A**

WAM-A: Medical Health Physics I

Co-Chairs: Larry Dauer, Mike Stabin

8:45 AM **WAM-A.1**

Medical Physics - Safety in the Crosshairs

Moeller, M., Austin, K., Austin, S.

Dade Moeller & Associates

9:00 AM **WAM-A.2**

Federal Radiation Protection Guidance for Diagnostic and Interventional X-Ray Procedures

Keith, L., Sears, S., Boyd, M.

Agency for Toxic Substances and Disease Registry (ATSDR), US Navy, National Naval Medical Center, Environmental Protection Agency (EPA)

9:15 AM **WAM-A.4**

Evaluation of Vendor Provided CT-DIvol

Johnson, P.G., Dong, F., Davros, W.

Cleveland Clinic

9:30 AM **Break in Exhibit Hall**

10:00 AM **WAM-A.5**

Large Variation in Organ Dose over Manufacturer and Model of CT Scanners

Dauer, L., Prins, R., St.Germain, J., Thornton, R.

Memorial Sloan-Kettering Cancer Center - Medical Physics, Memorial Sloan-Kettering Cancer Center - Radiology

10:15 AM **WAM-A.6**

CT X-ray Spectrum Analyzer

Marsh, D., Haskins, V., Baeslack, J., Lundberg, E., Caracappa, P.

Rensselaer Polytechnic Institute

10:30 AM **WAM-A.7**

A Combined Internal and External Dose Calculation Method for PET/CT

Mille, M., Gu, J., Ding, A., Caracappa, P., Xu, X., Stabin, M., Liu, B.

Rensselaer Polytechnic Institute, Vanderbilt University, Massachusetts General Hospital

10:45 AM **WAM-A.8**

Current Generation Realistic Dosimetry Models

Stabin, M., Fernald, M., Keenan, M., Clark, L., Marine, P., Segars, W.

Vanderbilt University, University of Idaho, Mid South Radiation Physics, Aberdeen Proving Grounds, Duke University Medical Center

11:00 AM **Medical Section Business Meeting**

8:30-11:45 AM Ballroom B

WAM-B: Environmental/Radon Section Special Session Radioecology

Co-Chairs: Craig Little, Jan Johnson

8:30 AM WAM-B.1
Radioecology: Pressing Forward
Whicker, J., Whicker, F.W., Breshears, D.
Los Alamos National Laboratory, Colorado State University, University of Arizona

8:45 AM WAM-B.2
Recent Advances in Radioecology
Garnier-Laplace, J., Gilbin, R., Alonzo, F., Hinton, T.*
IRSN

9:15 AM WAM-B.3
The Need for Transparency in Choosing Transfer Factors for Radioecological and Radiological Assessments
Higley, K.
Oregon State University

9:45 AM Break in Exhibit Hall

10:15 AM WAM-B.4
Development and Application of Radiological Assessment Models for Release of Long-lived Radionuclides to the Environment: Validation and Interpretation of Results
Smith, G.
GMS Abingdon Ltd

10:45 AM WAM-B.5
Determining an Appropriate Dose-Modifying Factor for Biota
Chambers, D., Higley, K., Kocher, D., Real, A.
SENES Consultants Limited, Oregon State University, SENES Oak Ridge, Inc., CIEMAT

11:15 AM WAM-B.6
Regulatory Challenges for Radiation Protection of the Environment
Graham, R., Boyd, M.
US Environmental Protection Agency

11:30 AM WAM-B.7
Foliar Interception, Retention, and Translocation of 36Cl
Bytwerk, D., Higley, K.
Oregon State University

11:45 AM Environmental/Radon Section Business Meeting

8:15-11:15 AM Ballroom C

WAM-C: Internal Dosimetry and Bioassay

Co-Chairs: Elizabeth Brackett, Gene Carbaugh

8:15 AM WAM-C.1
Phantom Male Series E: 1995 - 2009
Kramer, G., Hauck, B.
Health Canada

8:30 AM WAM-C.2
Determining Canine Organ Radiation Doses from PET-CT Procedures
Martinez, N., Johnson, T., Kraft, S., Harmon, J., Gibbons, D.
Colorado State University

8:45 AM WAM-C.3
Measurement of Actinides in Human Tissue and Bioassay Samples by Mass Spectrometry Techniques
Li, C., Benkhedda, K., Kramer, G.
Health Canada

9:00 AM WAM-C.4
A Software Solution to Bioassay Detector Calibration using a Library of Virtual Phantoms
Liu, T., Mille, M., Caracappa, P., Xu, X., Nour, S., Inn, K.
Rensselaer Polytechnic Institute, National Institute of Standards and Technology

9:15 AM WAM-C.5
Assessing Internal Contamination with a Portal
Monitor
Palmer, R., Burgett, E.A., Hertel, N.E., Ansari, A.
Georgia Institute of Technology, Centers for Disease Control and Prevention

9:30 AM WAM-C.6
Application of the Norman Voxelized Computational Phantom for In Vivo Bioassay Simulations
Olsher, R., Ennis, M., Justus, A., Bertelli, L., Waters, T.*
Los Alamos National Laboratory

9:45 AM WAM-C.7
Disaggregating Variance Due to Measurement Error from Variance Due to Population Variability to Produce a Distribution of Possibly True Results
Strom, D., MacLellan, J., Birchall, A., Zharov, P., Lynch, T., Antonio, C.*
Pacific Northwest National Laboratory, UK Health Protection Agency, Mayak Production Association

10:00 AM Break in Exhibit Hall

10:30 AM WAM-C.8
Metabolism of ^{210}Po and ^{131}I in Rats: Excretion of Volatile Species
Li, C., Sadi, B., Wyatt, H., Kramer, G.
Health Canada, Atomic Energy of Canada Limited

10:45 AM WAM-C.9
A Re-evaluation of ^{241}Am in Growth from ^{241}Pu Intake with the Effect of Progeny Intake
Bertelli, L., Waters, T., Miller, G., Hoffman, J.M., Gadd, M., Costigan, S.
Los Alamos National Laboratory, Los Alamos

11:00 AM WAM-C.10
Comparing an Ingestion Model with Data: ICRP 69 Uranium vs. New York City Tissue Data
Harley, N., Fisenne, I., Robbins, E.
New York University School of Medicine

8:30 AM-Noon Ballroom D

WAM-D: Special Session: Radiological Incident Consequence Management I

Co-Chairs: William Rhodes, Daniel Blumenthal

8:30 AM WAM-D.1
Field Test of Thermo Mobile Detection System (MDS) via Vehicle, Boat, and Helicopter
Baldini, E.
Philadelphia Police Department

9:00 AM WAM-D.2
The Empire 09 Full-Scale Exercise
Blumenthal, D.J.
US Department of Energy

9:30 AM Break in Exhibit Hall

10:00 AM WAM-D.3
An Overview of the Federal Radiological Monitoring and Assessment Center
Laiche, T.
Sandia National Laboratories

10:30 AM WAM-D.4
Consequence Management Home Team - Expanding Beyond the FRMAC
Mena, R.
Remote Sensing Laboratory-Nellis

11:00 AM WAM-D.5
A State Perspective on Nuclear Detonation Preparedness and Consequence Management
Lanza, J.
Florida Department of Health

11:30 AM WAM-D.6
Have I Been Nuked? A New System for Individual Retrospective Dosimetry to Aid in the Response to a Radiological Accident or Attack
*Larsson, C. L., Inrig, E. L., Andrews, H.R., Voevodskiy, A., Robins, M., Bray, N., Zhuo, H., Ing, H., Erhardt, L.S.**
Defence Research and Development Canada - Ottawa, Bubble Technology Industries, Inc.

8:30 AM-Noon 150 ABC

WAM-E: NCRP Special Session - Overview of Current Report and Conference Activities of the National Council on Radiation Protection and Measurements

Co-Chairs: Thomas Tenforde, Richard Toohey

8:30 AM WAM-E.1
Overview of Current Report and Conference Activities of National Council on Radiation Protection and Measurements (NCRP)
Tenforde, T.S.
National Council on Radiation Protection and Measurements

Reports of Program Area Committee 1 on *Basic Criteria, Epidemiology, Radiobiology and Risk*

9:00 AM WAM-E.2
Scientific Committee 1-16 Report on "Uncertainties in the Estimation of Radiation Risks and Probability of Disease Causation"
Hoffman, F.O.
SENES Oak Ridge, Inc.

9:15 AM WAM-E.3
Scientific Committee 1-17 Report on "Second Cancers and Cardiopulmonary Effects after Radiotherapy"
Gilbert, E.S., Travis, L.B.
National Cancer Institute, University of Rochester Medical Center

Reports of Program Area Committee 2 on *Operational Radiation Safety*

9:30 AM WAM-E.4
Scientific Committee 2-3 Report on "Fluoroscopically Guided Interventional Procedures"
Balter, S.
Columbia University

9:45 AM WAM-E.5
Report No. 162 on "Self Assessment of Radiation Safety Programs"
Myers, D.S.
Lawrence Livermore Laboratory, Livermore

Reports of Program Area Committee 4 (PAC 4) on *Radiation Protection in Medicine*

10:00 AM Break in Exhibit Hall

10:30 AM WAM-E.6
Overview of Current NCRP Activities in Radiation Protection in Medicine
Bushberg, J.T.
University of California, Davis Health System

10:45 AM WAM-E.7
Scientific Committee 4-2 Report on "Population Monitoring and Radionuclide Decorporation Following a Radiological or Nuclear Incident"
Vetter, R.
Mayo Clinic

Reports of Program Area Committee 5 on *Environmental Radiation and Radioactive Waste Issues*

11:00 AM WAM-E.8
Scientific Committee 5-1 Report on "Approach to Optimizing Decision Making for Late-Phase Recovery from Nuclear or Radiological Terrorism Incidents"
Chen, S.
Argonne National Laboratory

11:15 AM WAM-E.9
Scientific Committee 64-22 Report on "NCRP Scientific Committee 64-22: Design of Effective Radiological Effluent Monitoring and Environmental Surveillance Programs"
Kahn, B.
Georgia Institute of Technology

Reports of Program Area Committee 6 on *Radiation Measurements and Dosimetry*

11:30 AM WAM-E.10
Summary of NCRP Report No. 158: "Uncertainties in the Measurement and Dosimetry of External Radiation"
Simon, S.L., Beck, H.L.
National Cancer Institute

11:45 AM WAM-E.11
Scientific Committee 6-3 Report on "Uncertainties in Internal Radiation Dose Assessment"
Bouville, A., Bell III, R.
National Cancer Institute

8:30-11:30 AM 150 G

WAM-F: Operational Health Physics

Co-Chairs: Kevin Nelson, John Hageman

8:30 AM WAM-F.1
Determining the Activity in a Shipping Container Using a High Purity Germanium Detector
Gillenwalters, E.D., Debey, T.M., Johnson, T.E.
Colorado State University, US Geological Survey

8:45 AM **WAM-F.2**
Development of New American National Standards Institute Standard (N14.36), Measurement of Package and Coveyance Radiation Levels and Surface Contamination
Kapoor, A., Williams, J., Chen, S., Kamboj, S.*
US Department of Energy, US Department of Transportation, Argonne National Laboratory

9:00 AM **WAM-F.3**
HPS Toolbox
Nelson, K.
Mayo Clinic Florida

9:15 AM **WAM-F.4**
ALARA at a Byproduct Material Disposal Facility
Kraus, J., Kirkham, T., Kirk, J.S., Britten, J., Klotz, K.
Waste Control Specialists LLC, TIDEWATER-Chesnuc

9:30 AM **WAM-F.5**
Effect of Anatomical Modeling on Space Radiation Dose Estimates: A Comparison of Doses for NASA Dosimetry Phantoms and University of Florida Hybrid Phantoms
Bahadori, A.A., Van Baalen, M., Shavers, M.R., Semones, E.J., Dodge, C., Bolch, W.E.
University of Florida, NASA Johnson Space Center, Wyle Integrated Science and Engineering

9:45 AM **WAM-F.6**
The Safe Packaging for Transportation of a 42.8 GBq Radium Beryllium Source
*Zarling, J., Stewart, W.**
GTRI/NNSA Los Alamos National Laboratory, Los Alamos National Lab

10:00 AM **Break in Exhibit Hall**

10:30 AM **WAM-F.7**
Insights in Worker Counseling for Health Physicists
Johnson, R.H.
Dade Moeller Radiation Safety Academy

10:45 AM **WAM-F.8**
Neutron Calibration Sources Replacement Strategy at Lawrence Livermore National Laboratory
Radev, R.
Lawrence Livermore National Laboratory

11:00 AM **WAM-F.9**
Validation of a Radon Stripping Algorithm and Decay Curve Fitting for Transuranic Assay of Operational Air Filters
Hayes, R., Pena, A.
WIPP

11:15 AM **WAM-F.10**
Comparison of Methods Utilized for the Decontamination of Irradiated Topaz
Sullivan, M., Miller, J., Harris, J., Brey, R.
Idaho State University, International Isotopes Incorporated

2:30-5:00 PM **Ballroom A**

WPM-A: Medical Health Physics II

Co-Chairs: John Kwofie, Chris Martel

2:30 PM **WPM-A.1**
Characterizing Canine Organ Radiation Doses from CT Procedures
Hall, C., Harmon, J., Randall, E., Johnson, T.
Colorado State University

2:45 PM **WPM-A.2**
Occupational Dose Assessment During Computed Tomography Contrast Injections
Tannahill, G., Sturchio, G., Kofler, J., Bruesewitz, M., Vrieze, T.
Mayo Clinic

3:00 PM **WPM-A.3**
Dose Unawareness Causes Skin Injury - A Review
Lanka, V.
VA New Jersey Health Care System, East Orange, NJ

3:15 PM **WPM-A.4**
Cost Benefit Analysis of Single Use Patient Shields in Fluoroscopy
Jackson, A.
Henry Ford Hospital

3:30 PM **Break outside Meeting Rooms**

4:00 PM **WPM-A.5**
Radioembolization and Radiation Safety
Kwofie, J., Philips, L., Banghart, D., Amoroso, L.
Stanford University

4:15 PM **WPM-A.6**
Use of a Patient Survey to Evaluate Compliance with and Quality of Instructions Given to Patients Treated with Radioiodine
Vetter, R., Van Nostrand, D., Khorjekar, G., Ringel, M., Carter, E., Bloom, G.
Mayo Clinic, Washington Hospital Center, Ohio State University, MedStar Research Institute, ThyCa: Thyroid Cancer Survivors' Association

4:30 PM **WPM-A.7**
Therapeutic Iodine-131 Administration in Patients Unable to Swallow: A Novel Technique
Johnson, J.E., Shields, A.T.
University of Washington

4:45 PM **WPM-A.8**
Practical Experiences during Removal and Transfer of Medical LINACs
Williamson, M., Dauer, L., Quinn, B., Soukphouangkham, P.
Memorial Sloan-Kettering Cancer Center

2:30-3:45 PM **Ballroom B**

WPM-B: Accelerator

Co-Chairs: Gary Zeman, Henry Kahnhauser

2:30 PM **WPM-B.1**
Proposed Derived Air Concentration (DAC) Values for Radionuclides Not Listed in 10 CFR 835 Appendix A in Support of Spallation Neutron Source Operations at the Oak Ridge National Laboratory
McLaughlin, D., Schwahn, S., Gregory, D., Rao, G., Gillespie, T.
Oak Ridge National Laboratory

2:45 PM **WPM-B.2**
Radiation Dosimetry for 10 MeV Neutrons Using XRQA Radiochromic Film
Brady, S., Gunasingha, R., Yoshizumi, T., Howel, C., Crowell, A., Fallin, B., Tonchev, A., Dewhirst, M.
Duke University

3:00 PM **WPM-B.3**
Gamma Real-Time Dosimetry for Radiobiology Experiments
Mestari, A.M., Wells, P.D., DeVeaux, C.L., Ankrah, M.
Idaho Accelerator Center

3:15 PM **WPM-B.4**
Evaluation of Open Waveguide RF Hazard
May, R.
Jefferson Lab

3:30 PM **WPM-B.5**
Shielding Evaluations for a Food Irradiation Facility
Napolitano, D., Hertel, N. E.
NYSIS, A Division of Enercon Services, Inc., Consultant to ScanTech Sciences

3:45 PM **Break outside Meeting Rooms**

2:30-5:15 PM **Ballroom C**

WPM-C: CRSO Session DOT Train-the-Trainer

Chair: Marcum Martz

2:30 PM **WPM-C.1**
DOT training is required every three years for all staff who ship radioactive materials or prepare packages for shipment. This is a 90 minute presentation designed to acquaint the medical/academic RSO with all the regulatory requirements to enable the RSO to conduct complete training in-house.
Austin, S.
Dade Moeller & Associates

4:00 PM **Break outside Meeting Rooms**

4:15 PM **WPM-C.2**
Low-Level Radioactive Waste at Universities
Zittle, M.
Oregon State University

2:30-5:00 PM **Ballroom D**

WPM-D: Special Session: Radiological Incident Consequence Management II

Co-Chairs: William Rhodes, Daniel Blumenthal

2:30 PM **WPM-D.1**
Recent Research to Improve Response Planning for the Aftermath of a Nuclear Detonation
Buddemeier, B.
LLNL

3:00 PM **WPM-D.2**
Assessment of External Dose from Nuclear Fallout
Hunt, B., Kraus, T.
Sandia National Laboratories

3:30 PM **Break outside Meeting Rooms**

4:00 PM **WPM-D.3**
10 Point Monitoring Strategy
Stump, R.
Sandia National Laboratories

4:30 PM **WPM-D.4**
FRMAC Laboratory Analysis Operations and Capability Review
Shanks, A.
Sandia National Labs

2:30-5:00 PM 150 ABC

WPM-E: NRC Special Session on Safety Culture

Chair: Richard Toohey

2:30 PM WPM-E.1
Opening Remarks/Welcome
Toohey, R., Rakovan, L.
Health Physics Society, US Nuclear Regulatory Commission

2:35 PM WPM-E.2
What is the Safety Culture from a Theory Point of View
Thompson, C.
US Nuclear Regulatory Commission

2:50 PM WPM-E.3
NRC's Safety Culture Initiative
Ibarra, J.
US Nuclear Regulatory Commission

3:05 PM WPM-E.4
Activities and Reactions Leading up to the Workshop, at the Workshop, and Reaction to the Workshop Definition/Traits
Toohey, R.
Health Physics Society

3:20 PM WPM-E.5
Process in Arriving at Workshop Definition/Traits and Comparison to NRC Definition/Traits
Solorio, D.
US Nuclear Regulatory Commission

3:30 PM WPM-E.6
Q&As - Facilitated Discussion
Rakovan, L.
US Nuclear Regulatory Commission

3:50 PM Break outside Meeting Rooms

4:00 PM WPM-E.7
Radiation Safety Officer Safety Culture in my Work
Nelson, K.
RSO at Mayo Clinic, Jacksonville

4:10 PM WPM-E.8
What Safety Culture Means in my Arena
Kirk, S.
Material Licensee at Waste Control Specialists

4:20 PM WPM-E.9
International Radiation Protection Association (IRPA) Work
Toohey, R.
Health Physics Society

4:30 PM WPM-E.10
Q&As - Facilitated Discussion
Rakovan, L.
US Nuclear Regulatory Commission

2:30-4:45 PM 150 G

WPM-F: Military Section Special Session

Co-Chairs: Rick Rasmussen, William Hoak

2:30 PM WPM-F.1
Operation Iraqi Freedom/United States Forces-Iraq: Radiation Safety Program Overview
Stewart, H.
Eisenhower Army Medical Center, Department of Army

2:45 PM WPM-F.2
The Atomic Bomb Accident at Mars Bluff: New Experiences in Communicating Nuclear Science to the Public and the Media
Jokisch, D.
Francis Marion University

3:00 PM **WPM-F.3**
Intentional Poisonings with Radioactive Materials
Sorcic, J., Johnson, T.
Colorado State University

3:15 PM **WPM-F.4**
Medical Implications of Enhanced Radiation Weapons
Reeves, G.
TASC

3:30 PM **Break outside Meeting Rooms**

4:00 PM **WPM-F.5**
Radiation Safety in the U.S. Army Installation Management Command
Cherry, R.
US Army Installation Management Command

4:15 PM **WPM-F.7**
Review and Analysis of Army Radiation Exposures
Bosley, W.S., Melanson, M., Harris, W.
Office of the Army Surgeon General, US Army Dosimetry Center

4:30 PM **WPM-F.8**
The Current State of the Department of Defense's Non-ionizing Bioeffects Research Efforts
Nichelson, S., Constable, R., Ziriax, J., Stuck, B.
US Air Force, US Navy, US Army

2:30-5:00 PM **251 D**

Movies

5:15 PM **Ballroom B**

HPS Business Meeting

6:00-8:00 PM **Canyon A (Hilton)**

WPM-G: Aerosol Measurements

Chair: Morgan Cox

WPM-G.1 WIPP Air Monitoring Measurements with the iSolo, Bladewerx ASC and the Alpha-7 CAMs
Hayes, R., Pena, A.
Washington TRU Solutions, LLC

WPM-G.2 Modeling Radioactive Aerosol Transport by Wind Erosion through Vegetation Succession
Whicker, J., Kirchner, T., Breshears, D.
Los Alamos National Laboratory, New Mexico State University/Carlsbad Environmental Monitoring and Research Center, University of Arizona

WPM-G.3 IEC Technical Committee 45 and ANSI N42 Nuclear Instrument Standards- US Contributors and Contributions
Cox, M.
SEC

WPM-G.4 WIPP Solutions for Radon Progeny Mitigation in Operations
Hayes, R., Pena, A.
Washington TRU Solutions, LLC

WPM-G.5 The LANL Radiation Protection Group Wind Tunnel: A Facility Adapted to Three Standards and Applications
Moore, M., Fuehne, D., Schafer, D.
Los Alamos National Laboratory, University of New Mexico

WPM-G.6 Status of Two ANSI N42 Standards for Air Monitoring: ANSI N42 Radon Progeny Monitoring Instruments and the New Comprehensive Air Monitoring Standard for all Radionuclides at all Locations
Discussion moderator: Robert Hayes

Discussion
Challenges and Opportunities for the AMUG
Co-moderated by Mark Hoover and Morgan Cox
NIOSH, SEC

THURSDAY

8:15-10:45 AM Ballroom A

THAM-A: Medical Health Physics Section Special Session

Co-Chairs: Mahadevappa Mahesh, Alan Jackson

8:15 AM THAM-A.1

Patient/Public Dose Reduction Efforts in an Academic Medical Center

Jacob, N.

Rhode Island Hospital/Warren Alpert Medical School of Brown University

8:45 AM THAM-A.2

Fluoroscopic Patient Dose Tracking and Follow Up at a Large Urban Hospital

Martel, C., Weber, P., John, R., O'Horo, S.

Brigham & Women's Hospital

9:15 AM THAM-A.3

Radiopharmaceutical Quality Related Events: A Nuclear Pharmacy Perspective

Nelson, B.

Triad Isotopes, Inc.

9:45 AM THAM-A.4

Beyond Molybdenum-99: Update on Radioisotope Production in the U.S.

Fisher, D.

Pacific Northwest National Laboratory

10:15 AM THAM-A.5

Radiological Protection in Medicine - Summary of Recent ICRP Advice

Dauer, L.

Memorial Sloan-Kettering Cancer Center

8:30-10:30 AM Ballroom B

THAM-B: NCI Special Session NCI Dosimetry Studies

Co-Chairs: Steve Simon, Andre Bouville

8:30 AM THAM-B.1

Overview of Fallout Dosimetry Methods and History of Studies

Bouville, A., Simon, S.L., Drozdovitch, V., Luckyanov, N., Moroz, B., Beck, H.L.

National Cancer Institute, National Institutes of Health, Bethesda, New York City

8:45 AM THAM-B.2

Radiation Doses to Marshallese Associated with Exposure to Local and Regional Radioactive Fallout from Bikini and Enewetak Nuclear Weapons Tests

Simon, S.L., Bouville, A., Melo, D., Beck, H.L., Moroz, B., Weinstock, R.M.

National Cancer Institute, National Institutes of Health, RTI, Inc.

9:00 AM THAM-B.3

Reconstruction of Exposures from Nuclear Tests in Kazakhstan

Drozdovitch, V., Beck, H.L., Bouville, A., Land, C.E., Luckyanov, N., Weinstock, R.M., Simon, S.L.

National Cancer Institute, National Institutes of Health, RTI, Inc.

9:15 AM THAM-B.4

Predictions of Dispersion and Deposition of Fallout from Nuclear Testing Using a Meteorological Computer Model

Moroz, B.E., Beck, H.L., Bouville, A., Simon, S.L.

National Cancer Institute, National Institutes of Health

9:30 AM THAM-B.5
Overview of Reconstructing Past Medical Exposures in Support of Epidemiologic and Health Risk Studies at the National Cancer Institute
Simon, S.L., Thierry-Chef, I., Melo, D., Lee, C., Kim, K.P., Miller, D.L.
National Cancer Institute, National Institutes of Health, International Agency for Research on Cancer, France, Kyung-Hee University, Korea, National Naval Medical Center

9:45 AM THAM-B.6
Radiation Doses to the Female Breast from Mammography from 1960 to the Present
Thierry-Chef, I., Simon, S.L., Weinstock, R.M., Linet, M.S.
International Agency for Research on Cancer, France, National Cancer Institute, National Institutes of Health, RTI International

10:00 AM THAM-B.7
Organ Dose Reconstruction for Hyperthyroid Patients Treated with ^{131}I
Melo, D.R., Zanzonico, P., Brill, A., Stabin, M., Vicini, P., Kwon, D., Moroz, B., Bouville, A., Simon, S.L.
National Cancer Institute, National Institutes of Health, Memorial Sloan-Kettering Cancer Center, Vanderbilt University, University of Washington

10:15 AM THAM-B.8
Occupational Doses from Cardiac Catheterization Procedures
Kim, K.P., Simon, S.L.
Kyung Hee University, Korea, National Cancer Institute, National Institutes of Health

8:30 AM-Noon Ballroom C

THAM-C: CRSO Session Regulatory Trends

Chair: Marcum Martz

- Security (Part 37)
- NARM Update
- Medical Event Update
- ACMUI
- NRC Speaker (TBD)

10:30 AM CRSO Business Meeting

8:15-10:00 AM Ballroom D

THAM-D: Emergency Planning

Co-Chairs: John Lanza, Craig Marianno

8:15 AM THAM-D.1
Radionuclide Resuspension Considerations for RDD Fallout
Waller, E., Perera, S.
University of Ontario Institute of Technology

8:30 AM THAM-D.2
Software for First Responders Allowing for Interpretation of Portable Survey Meter Responses in Radiological Triage Decisions
Juneja, B., Bolch, W., Lee, C.
University of Florida, National Institutes of Health

8:45 AM THAM-D.3
Using Radioactive People
Kramer, G., Hauck, B.
Health Canada

9:00 AM THAM-D.4
Exercise Gold - Lessons Learned
Kramer, G.
Health Canada

9:15 AM THAM-D.5
Is It an 'Incident' or an 'Event'?
Lanza, J.
Florida Department of Health

9:30 AM THAM-D.6
Response to Radiological and Nuclear Terrorism: A Guide for Decision Makers (NCRP REPORT No.165)
Groves, K.L., Poston, Sr., J.W.
S2-Sevorg Services, LLC, Texas A&M University

9:45 AM THAM-D.7
A Stamp Sized Instant Casualty Dosimeter
Patel, G.N., Watanabe, Y.
JP Laboratories, Inc, Masonic Cancer Center

8:15-9:45 AM 150 ABC

THAM-E: Regulatory/Legal

Co-Chairs: Kathryn Brock, Stanley Hampton

8:15 AM THAM-E.1
Tritium Exit Sign Use
Hampton, S.D., Kay, S.E., Mays, T.L., Baker, J.P.
Eli Lilly

8:30 AM THAM-E.2
Overview of NRC Part 50 and Appendix I Regulations Update
Dehmel, J., Roach, E.
US Nuclear Regulatory Commission

8:45 AM THAM-E.3
National Priorities List Site Boundary Definition at the Oak Ridge Reservation
King, D.A.
Oak Ridge Institute for Science and Education

9:00 AM THAM-E.4
Balance of Pregnancy Dose Limits
Waller, E.
University of Ontario Institute of Technology

9:15 AM THAM-E.6
Regulatory Challenges of Introducing a Handheld Dental Intraoral X-Ray Device
Harding, D.C., Turner, D.C., Bailey, E.D.
Aribex, Inc., Consultant, CHP

9:30 AM THAM-E.7
Radiation Safety During the Remediation of Legacy Sites Including Spent Fuel Management. Regulatory Challenges in Assessment and Supervision
Sneve, M.K., Shandala, N.K., Kiselev, M. F.
Norwegian Radiation Protection Authority, Norway, Federal Medical Biological Center, Russian Federation

8:30-10:00 AM 150 G

THAM-F: Nanotechnology Special Session

Co-Chairs: Scott Walker, Lorraine Marceau-Day

8:30 AM THAM-F.1
Potential Biological Effects of Nanoparticles
Marceau-Day, M.L.
LSU-CAMD

9:00 AM THAM-F.2
Nanotechnology Metrology and Risk Assessment
Marceau-Day, M.L.
LSU-CAMD

9:30 AM Discussion
Nano-Particle Health Physics Panel Discussion

AAHP Courses
Saturday 26 June 2010 - 8 AM-5 PM

AAHP 1 Training Emergency Responders; Materials, Tools, and Methods for Health Physicists

Brooke Buddemeier, Tom Clawson

Lawrence Livermore National Laboratory, Technical Resources Group, Inc.

Research and development for response to the aftermath of radiological or nuclear terrorism is currently being funded by the Department of Homeland Security (DHS). DHS, the Health Physics Society, and The National Council on Radiation Protection and Measurement (NCRP) have been developing updated guidance, some of which can be found on the Homeland Security Committee section of the HPS website (www.hps.org/hsc). The course will discuss a summary of some of the discoveries being made and how they impact the needs of the response community. In addition to certifications in the training programs below (3 CDs full movies and training materials), information will be provided on the how to interface with emergency responders and national programs that are available to fund and equip local responders.

Excellent training materials exist for training first responders (firefighters, law enforcements, EMT), but you can't just download all them off the internet. Students who successfully complete this class will become certified trainers in at least 2 responder training programs. Over 20 hours of "Train the Trainer" coursework has been compressed into this class designed for the radiation safety professional. The recently updated Modular Emergency Response Radiological Transportation Training (MERRTT) offers over 16 modules of multimedia rich training material including presentations, student & instructor guides, tests, practical exercises, and regionally available training aids.

Morning Session

Modular Emergency Response Radiological Transportation Training Program (MERRTT), Train the Trainer session #1 and trainer certification test

Afternoon Session

- Recent analysis on the effects of a low yield nuclear detonation on a modern US city and response recommendations.
- Additional modules on radiological and nuclear terrorism response from Homeland Defense Equipment Reuse (HDER)
- Current guides, recommendations, and standards for radiological emergency response
- Engaging and interfacing with the responder community

AAHP2 8-hour HAZWOPER Refresher Course

Wayne Gaul

Chesapeake Nuclear Services, Inc.

The 8 hour HAZWOPER course will be designed to refresh the student in topics relevant to hazardous waste operations in accordance with

29 CFR 1910.120(e)(8). The course is designed to fulfill the annual 8 hour training requirements and will include a short exam and the student will receive a Course Certificate upon successful completion of the course. Items covered will include, but not be limited to, review of applicable regulations, health and safety plans, job safety analysis, emergency response, personnel protective equipment, hazard communication, TLV-PEL updates, confined space, fundamentals of chemical hazards, air sampling for chemicals, spill control, engineering controls and decontamination techniques. Additional topics may be covered to update the student on new or upcoming regulatory changes.

Professional Enrichment Program (PEP)
Sunday 27 June through Thursday 1 July

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 27 June, a series of 16 courses will be offered between 10:30 am - 4:00 pm.

In addition to the above-mentioned sessions for Sunday, six PEP lectures are scheduled on Monday, and five on Tuesday and Wednesday afternoons from 12:15 - 2:15 pm, and five on Thursday from 10:45 am - 12:45 pm. Registration for each two-hour course is $90 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the preregistration 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.

Sunday - 10:30 am-12:30 pm

PEP 1-A Conducting ANSI Z136-Based Laser Hazard Calculations

Ben Edwards

Duke University Medical Center

This course provides a step by step approach to performing the laser hazard calculations specified in the ANSI Z136.1-2007 Standard for the Safe Use of Lasers. This session will include a review of relevant radiometric terminology and the corresponding Z136 nomenclature, as well as a practical explanation of the physical quantities and physics concepts involved. The calculation of irradiance, radiant exposure, maximum permissible exposure values, optical density, and nominal ocular hazard distance will also be covered for both continuous wave and repetitively pulsed lasers. While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser safety responsibilities will benefit from this course. Students should bring a scientific calculator, and will also find bringing their own copy of the ANSI Z136.1-2007 Standard a helpful reference.

PEP 1-B Operational Accelerator Health Physics Part I

L. Scott Walker, Robert May
Los Alamos National Laboratory, Thomas Jefferson National Accelerator Facility

The Operational Accelerator Health Physics I class covers an overview of medium and high energy accelerators, electron accelerators configuration, electron accelerator radiation production, electron accelerator shielding, electron accelerator radioactive material production, and electron accelerator environmental impacts. The class then begins to focus on proton accelerator configuration, proton accelerator radiation production, accelerator produced isotopes, accelerator interlock systems, general health physics practices at accelerators, general accelerator health physics rules of thumb, high energy radiation physics for the health physicist, and useful references.

PEP 1-C Status of ANSI N42.RPI Standards for Radiation Protection Instrumentation

Morgan Cox
CHP

This presentation covers seventeen (17) American National Standards Institute (ANSI) standards currently in effect for Radiation Protection Instrumentation (RPI) in the United States. These standards cover design, construction, performance and performance testing requirements, testing and calibration requirements for the range of nuclear radiation detectors: from portable radiation detectors for use under all environmental conditions, alarming electronic personnel dosimeters, airborne radioactivity monitors for all radionuclides, radiation detection instrument communication protocols, in-plant plutonium monitoring, reactor emergency monitoring instrumentation, installed radiation monitors such as area monitoring systems and contamination monitors, carbon/quartz fiber personnel dosimeters, personnel radiation warning devices, and radon progeny and radon gas monitoring systems.

All of these standards are under continuous review using the five year rule wherein standards are reaffirmed, revised or replaced following review. Some of the major contributing experts, past and present, are recognized for outstanding achievements.

Audience participation is requested and is important to the success of this presentation.

PEP 1-D Health Physics Considerations for Production of PET Radionuclides for Radiopharmaceutical and Research Uses

Roger Moroney
Siemens/PETNET

The use of Positron Emission Tomography, or PET, has expanded rapidly in the last few years, and is projected to continue to increase in volume each year as physicians and patients become more aware of PET's diagnostic capabilities. All PET radionuclide production starts with an accelerator. Most of the accelerators in use for this purpose are small cyclotrons with maximum proton energy of less than 20 MeV. These cy-

clotrons may be self-shielded or use a bunker. The prompt radiation fields around these cyclotrons include high energy photons and neutrons with the magnitude of the field depending on the radionuclide being produced, the particle type and energy, and the beam current. Secondary radiation fields arise from the desired PET radionuclide produced as well as from activation products. PET radionuclides produce two 511 keV photons per positron, which requires much thicker shielding than for the traditional nuclear medicine radionuclides during production, research and transport in order to manage personnel exposures. Activation products present in the target and surrounding areas create external radiation fields during maintenance activities and must be managed to keep exposures low to personnel maintaining the cyclotron. Production of some radionuclides and radiopharmaceuticals lead to airborne effluents that may require control and/or monitoring to demonstrate compliance with regulations. Good facility design is critical to ensuring adherence to regulations as well as to improve operational efficiencies that will lead to lower radiation exposures to staff. The combination of these items leads to a dynamic and complex radiological environment that provides a good challenge to today's Health Physicists.

PEP 1-E EH&S "Boot Camp" for Radiation Safety Professionals: A Unique 3 Part PEP Course Series, 2010 (Part 1)

Robert Emery, Janet Gutierrez
The University of Texas Health Science Center at Houston, The University of Texas School of Public Health

It is currently quite rare for organizations to maintain stand-alone radiation safety programs. Resource constraints and workplace complexities have served as a catalyst for the creation of comprehensive environmental health & safety (EH&S) programs, which include among other health and safety aspects, radiation safety programs. Unfortunately, many of these consolidations were not accompanied by formal staff training efforts to instill an 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 Risk Management & Insurance" and "The Basics of Fire & Life Safety." The risk management & in-

surance 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. 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

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 1-F Monitoring Strategies for Uranium Recovery Facilities

Jim Cain
Cotter Corporation

Regulatory guidance for occupational and environmental monitoring programs is primarily provided in Nuclear Regulatory Commission Guides 8.22, 8.30, 8.31, 4.14 and 4.15. Practical experience over 30 years for an operating uranium mill as well as supporting remedial programs and dismantling and decommissioning activities provides the basis for providing flexible radiation protection program procedures to support these activities. The presentation will focus on the interaction between Training, ALARA, Occupational and Environmental Monitoring Programs. These programs are designed to minimize dose to the individual worker, to the public and minimize impact on the environment. The critical aspects of effective programs are management support, employee training, ALARA committee, laboratory support and quality assurance.

Key elements

* Training Program: Initial and periodic training of personnel. Topics are Regulations, Hazard and Risks, Protective Measures, ALARA Program, Occupational and Environmental Monitoring Programs and Worker habits

* ALARA Program: ALARA Review Committee which consists of the RSO, Assistant RSO, Safety Supervisor, Operational Foreman and workers from operations, maintenance and utility. Functions are to do weekly inspections, monthly and quarterly reviews with management, establish goals and be advocates in the workplace.

* Occupational Monitoring Program: Airborne particulate monitoring and radon progeny may be done using fixed sampling locations as well as breathing zone personnel monitoring. Mixtures of uranium and decay products as well as solubility can be quite variable, for instance, uranium product areas generally have soluble uranium with minimal decay products whereas tailings areas may be dominated by Thorium-230. Bioassay for uranium in urine and chest

counting may be used to verify the confinement of particulates. External Dosimetry may be measured using TLDs and supplemented by periodic surveys. Contamination control may be verified by surveys especially for lunchrooms and/or control rooms. Dose estimation may be done using daily tracking of work locations in conjunction with air monitoring data and TLD results. Doses are sometimes modified based on bioassay results.

* Environmental Program: Airborne particulate monitoring (24/7) may be done using fixed sampling locations including Radon and TLD; soil sampling may be done annually as well as vegetation. A 24/7meteorological station may be maintained. Groundwater and surface water sampling may be done at selected locations generally quarterly. Stack sampling may be done monthly or quarterly. Radon Flux may be done on tailings beaches annually. Dose compliance may be determined utilizing the MILDOS computer code which uses stack emissions, area source emissions based on soil sampling and meteorological data. Estimated concentrations from this model may be compared to measured air, soil and vegetation concentrations.

PEP 1-G Filtration and Flow-Control Fundamentals for Sampling Airborne Nanoparticles and Other Ultrafine Aerosols

Mark D. Hoover
National Institute for Occupational Safety and Health

Sampling by filtration is an important method for collecting and evaluating any type of airborne material, including nanoparticles and other ultrafine aerosols such as radon decay products. Given the considerable current interest in characterizing and controlling risks to worker health from potential exposures to engineered nanoparticles, this course will present fundamentals of inertia (efficient collection for large particles) and diffusion (efficient collection for very small particles) that affect the efficiency and most penetrating particle size (MPPS) of filters; efficiency and MPPS for the various filter types that can be used for collection of nanoparticles; and issues for selection of filters with appropriate collection efficiency, MPPS, durability, pressure drop, and surface characteristics. A series of practical problems will also be presented on how to avoid common errors in flow calibration and control when rotameters are used to monitor and control the sampling flow rate. Because rotameters are typically located downstream of a filter or other sampling device, the internal rotameter pressure is lower than the ambient atmosphere from which the sample is being drawn. Depending on the pressure drop conditions (perhaps 1 psi for a filter and perhaps several psi for other sampling instruments such as a cascade impactor) the errors can exceed the 5% level recommended for making a correction. It will be emphasized that both the rotameter equation and the ideal gas law must be used to determine the actual flow rate associated with a given scale reading in relation to the calibrated flow rate for that scale reading. Course problems will demonstrate how confusion can

be eliminated by defining and using a multiple-frame-of-reference scheme involving the following conditions of temperature and pressure: (1) calibration, (2) operation (inside the rotameter), and (3) ambient (typically the actual conditions where the worker is located and the sample is being taken), as well as two types of reference conditions (4) normal or standard ambient (760 mm Hg and either 20 degrees Celsius or 25 Celsius), and (5) standard (760 mm Hg and either 0 degrees Celsius for chemists or 25 degrees Celsius for ventilation specialists). This system clarifies that the rotameter equation is only to be used for the correction between calibration and the operation, and that the ideal gas law is to be used for corrections among all other combinations of the frames of reference. An Excel spreadsheet with detailed examples and calculations will be demonstrated and provided to course participants.

PEP 1-H Future of Nuclear Power
Mark Miller
Sandia National Laboratories

This PEP will explore "Nuclear Power as Part of Our Energy & Economic Surety Future." The presentation will cover the role commercial nuclear power could play in the "energy portfolio" that this country (and the world) should seek to assemble as we face the seemingly insurmountable problems of "clean" energy availability, economic prosperity, global warming and energy security. As we explore the issues, we will discover that the solution is SIMPLE, but it won't be EASY!

With the current global warming issues and looming energy crisis, we must objectively evaluate the facts regarding the world energy crisis and, based on the weight of the evidence, draw reasonable conclusions from them and then strive to see that they are implemented on a national and even world scale. There is no question that there will be increasing potential for regional and global conflict over access to conventional energy resources which are essential to achieving a better standard of living. Nuclear power will help address these crucial issues. We will explore the Top Ten Myths about Nuclear Energy as well as technical fundamentals.

Sunday - 2:00-4:00 pm

PEP 2-A A Comparison of Two University Affiliated Research Reactor Health Physics Programs and some Lessons Learned from Radiation Safety Program Benchmarking at these Reactors
Ron Dobey, Dave Tucker
University of Missouri-Columbia, McMaster University, Canada

The 10 MW University of Missouri Research Reactor (MURR) is North America's largest university based research reactor facility. The 5 MW McMaster Nuclear Reactor in Hamilton, Ontario, Canada, is tied (with the MIT reactor) as the second largest. Both have active teaching, research and isotope production programs.

Well developed peer and industry association evaluation programs

exist in the nuclear power industry but no such program exists for research reactors. Radiation safety program benchmarking was undertaken by the facilities in order to identify best practices and augment the self-evaluation programs in place. The basis for the evaluations was ANSI/ANS-15.11-1993 American National Standard for Radiation Protection at Research Reactor Facilities. Program elements evaluated in the first round included:

• Program, Policy and Organization

• Radiation Monitoring

• ALARA Objectives, Program and Audits

Several challenges which had to be overcome included: different regulatory environments at the two facilities; significant differences in design of the facilities; and differences in the scope and nature of work underway. Despite these difficulties, valuable lessons were learned. Mutual benefit was derived both from identifying consistent approaches between the facilities and in identifying opportunities for improvement.

PEP 2-B Operational Accelerator Health Physics Part II

L. Scott Walker, Robert May
Los Alamos National Laboratory, Thomas Jefferson National Accelerator Facility

Operational Accelerator Health Physics II focuses on specific medium and high energy accelerator related design, control and health physics problems. The topics include: Spallation targets, handling high dose rate targets, beam dump design, isotope production, cooling water systems, shutters, radiation detection instrumentation, personnel dosimetry, high dose dosimetry (measuring radiation damage to equipment), high energy neutron spectroscopy, skyshine, releases of airborne radionuclides accelerator related electrical hazards, and the accelerator health physics program.

PEP 2-C Uranium Internal Dosimetry

Bill Riley
Oak Ridge Associated Universities

This course offers a review of internal dosimetry with a focus on monitoring and calculating doses from intakes of uranium isotopes. Topics that will be presented are the effect of enrichment of uranium on dose calculation, biokinetics of uranium, and bioassay techniques and dose calculation. The focus will be on practical application of a uranium bioassay program with example dose calculations presented for different scenarios. Both ICRP 30 and ICRP 66 models will be discussed.

PEP 2-D Designing High Impact Presentations for a Digital Generation

Jeremy Krampert, Adam Cook, Vincent Williams
Merck Sharpe & Dohme Corp., A Subsidiary of Merck & Co., Inc.

As health physicists, a very important part of our job is disseminating information to members of the general public, as well as colleagues and peers. No matter how accurate or significant this information is, if the presentation packaging is mundane, it can affect the overall impact of your training program.

This PEP will review a variety of the technologies available to assist you in creating engaging, multimedia experiences. We will demonstrate the various skills needed to implement your own creative ideas and discuss the cost associated with using the technologies described throughout the class.

During this session we will use many of these technologies and demonstrate their ease of use and effectiveness. Attendees will leave the session with new ideas and tools to improve their presentations.

PEP 2-E EH&S "Boot Camp" for Radiation Safety Professionals: A Unique 3 Part PEP Course Series, 2010 (Part 2)

Robert Emery, Janet Gutierrez
The University of Texas Health Science Center at Houston, The University of Texas School of Public Health

See PEP 1-E for full description.

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

PEP 2-F Interactions of Nanotechnology and Health Physics

Lorraine Day
Center for Advanced Microstructures and Devices (CAMD)

Recognizing the importance of emerging technologies and their potential influence on the practice of Health Physics, the HPS established a Nanotechnology working group at the annual meeting in Minneapolis in 2009. As more and more health physicists, especially those working with accelerators, like synchrotron rings and neutron sources, are exposed to the potential hazards and technological breakthroughs of this cutting-edge science, they must retool to be able to make informed decisions about nanotechnology. This PEP course is structured to give the participant a perspective on this technology, and proposes safe handling techniques to enable he/she to make informed decisions. The initial section of the course will outline the special properties of Nanomaterials. This includes an overview of the field of nanotechnology, including chemistry, material properties, and metrology as it pertains to synthesis and measurement. The 2nd portion of the course will focus on Nanotechnology and Nanomaterials and their interaction in day to day operational health physics, and the potential for this technology to impinge on medical physics. In addition to these technical topics, some time is set aside for risk assessment and ethical issues pertaining to this relatively new field. This course offering relating to Nanotechnology seeks to act as a building block for future lectures on this topic, as they relate to Health Physics.

PEP 2-G Applied MARSSIM Approaches and the Evolution of Decommissioning Surveys

Tom Hansen
Ameriphysics, LLC

In 1997, the process by which we decommission radiologically impacted sites was revolutionized. The NRC's license termination rule gave us risk-based release criterion, and for the first time, site clean-up was based on sound health-physics principles rather than meaningless values. That same year, the EPA, DOD, DOE, and NRC agreed upon a consensus document that contained a statistically rigorous, yet flexible, methodology for conducting and assessing radiological surveys: the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM).

Originally, the Health-Physics community embraced our shiny new tools, but over the past thirteen years, our interest has slowly subsided. The MARSSIM remains an important part of the decommissioning process, but in many applications its significance has been reduced to more or less a "rubber stamp" rather than that of an important tool in decommissioning planning, particularly at commercial sites in agreement states. A revision of MARSSIM is planned for 2010, however, and this lecture is intended to revitalize interest in the guidance the document provides.

The first part of this course will be a refresher on a few of the fundamental topics of MARSSIM. The scope, rationale, and limitations of MARSSIM will be discussed, followed by an overview of the Radiation Survey and Site Investigation Process. The Historical Site Assessment, Scoping Survey, Characterization Survey, Remedial Action Survey, Final Status Survey, and Verification will be discussed. Other topics to be covered include release criterion, derived concentration guideline levels, and survey unit classification.

This course will also describe trends in applied MARSSIM methodologies.

Specific examples of how the Radiation Survey and Site Investigation Process has degraded will be reviewed. ALARA goals, surveyor efficiency, and scan speed will be discussed in detail.

The course will conclude with examples of commercial sites that have undergone decommissioning using the MARSSIM approach. The lecturer will present a "Historical Site Assessment" for each case and the participants will be asked to help determine a MARSSIM-based solution using what they have learned previously.

Attendees are invited to bring their unique decommissioning problems to the course. If time permits, the lecturer will facilitate a discussion to suggest MARSSIM-based solutions.

PEP 2-H Cloud Chamber Theory and Construction

Thomas E. Johnson, Graduate Students (assisting)
Colorado State University

Cloud chambers are excellent tools for teaching and demonstrating how different types of radiation interact with matter. Students from grade school to post doctoral fellows are

consistently mesmerized by the interaction of radiation and the "clouds" created in a cloud chamber. This class will consist of two parts, one covering theory and another covering construction. In the first part of this class we will briefly review the theory on how cloud chambers operate, and how particles and photons interact with the supersaturated atmosphere generated in a common cloud chamber. The second part of this class will consist of constructing a cloud chamber, setting it up, and operating it! Since Salt Lake City is at an altitude of over 4000 feet, there will be plenty of cosmic rays to interact with the cloud chamber. If you would like to participate and construct your own cloud chamber to build in class, please contact the instructor. The CSU student branch of the HPS will provide the materials to construct your very own cloud chamber that you can take home with you for an additional fee. Beware!

The cloud chambers we will be building will be too large to fit into your suitcase, and they are addictive to watch!

Monday - 12:15-2:15 pm

PEP M-1 Counseling Workers – Part I, Understanding the Basis for Upset and Fears

Ray Johnson
Dade Moeller Associates

What is the greatest challenge in the course of your work in radiation safety – technical issues or people issues? For those of you that may answer the latter, this class will provide insights on how to better understand and be more successful with people issues. Are you stressed when confronted by emotional issues at work? Do you know how to provide a helpful response for an upset or fearful person, or would you rather avoid these people? Do you believe the workplace would be more efficient if people left their feelings at home and just did their jobs? Do you find yourself perplexed about people who are afraid of radiation? I suggest that all of us could be afraid of radiation under certain circumstances. Thus, fear of radiation is a common denominator for all workers, although the extent of such fears appears to be related to technical understanding of radiation. Without special training in radiation safety most workers' understanding is based on radiation mythology which is not supported by good science. Workers' fears are often related to mythical beliefs and images of terrible consequences that may result from radiation exposure. Often workers make assumptions about radiation effects without understanding that there are a series of steps for answering the question, "Is it safe?" Fears are always based on what we imagine and not on reality. The basis of what we imagine can be identified by asking the question "What's so bad about that?" By repeating this question we can move down through layers of images to the real motivation for upset and fear. When we understand what drives upset and fears, we can then offer the most helpful responses. Attendees should write down and bring to the class one or more specific scenarios where they would like to apply the insights from this class.

PEP M-2 EH&S "Boot Camp" for Radiation Safety Professionals: A Unique 3 Part PEP Course Series, 2010 (Part 3)

Robert Emery, Janet Gutierrez
The University of Texas Health Science Center at Houston, The University of Texas School of Public Health

See PEP 1-E for full description.

* 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 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.

PEP M-3 Optical Radiation: An Overview of Biological Effects and Exposure Limits

David H. Sliney

Health physicists may occasionally face questions about the safety of an intense optical radiation source, e.g. a high power lamp, a laser, the sun, an open arc, an ultrabright light-emitting diode. While detailed ANSI Z136 standards address laser hazards, conventional optical radiation sources often present an area of the unknown. Exposure limits and lamp safety standards do exist. During the past 40 years a wide range of research has provided the basis for establishing human exposure limits for ultraviolet and infrared radiation as well as for intense visible light. This course will summarize optical radiation bioeffects and discuss the exposure limits established by the International Commission on Non-Ionizing Radiation Protection (ICNIRP – exposure limits available free at www.icnirp.org) and the similar Threshold Limit Values (TLVs) of the American Conference of Governmental Industrial Hygienists (ACGIH). Despite the existence of safety standards and regulations, accidental eye and skin injuries still occur. Accidents are most frequently attributed to the lack of understanding of hazards and safety procedures. While some knowledge of optical radiation characteristics may be helpful, both expe-

rienced and novice health physicists with optical radiation safety interests or responsibilities will benefit from this course.

PEP M-4 Part II Accelerator Health Physics ABHP Exam Problems

L. Scott Walker
Los Alamos National Laboratory

Health Physics examinees normally stay away from Accelerator Health Physics problems on the ABHP Part II exam. For some reason accelerator health physics is seen as an obtuse field for most personnel who take the exam. With some basic knowledge, most Part II accelerator based problems are not that difficult. More complex problems take computer assistance and usually involve more than an hour of effort. Thus, ABHP Part II accelerator based exam problems are normally straight forward. The ABHP Part II problems PEP class will focus on simple problems necessary to support the operation of an accelerator and solving those problems given on the exam. Those completing this class will be provided with the necessary background to process these problems in a straight forward manner. This class will include problems at both proton and electron accelerators and includes high energy physics issues that impact health physics management and are associated with accelerator operation.

PEP M-5 Introduction to Monte Carlo Methods for the Health Physicist (Part 1)

Peter F. Caracappa
Rensselaer Polytechnic Institute

Monte Carlo techniques are extensively used in computer calculations of radiation transport in matter. Of interest to Health Physicists is the ability to determine values such as absorbed dose or dose equivalent distributions in a variety of applications. The more complex the problem, the greater the need for computer simulations, and it is desirable for the health physicist to have some understanding of their basis. The purpose of this course is to provide the attendees with a feel for what Monte Carlo techniques are, how they are applied in health physics work, and what their reliability and limitations may be. The course will be presented in three parts.

Part I will provide a theoretical overview of radiation transport and methods for estimating the radiation flux or dose using Monte Carlo. We will walk through the steps of a Monte Carlo simulation history and discuss the needs in geometry, nuclear data, tallies and variance reduction that are used.

PEP M-6 HPS/ANSI N13.53, Control and Release of Technologically Enhanced Naturally Occurring Radioactive Material

Philip Egidi
Colorado Department of Public Health and Environment

This new HPS/ANSI standard specifies dose limits and release criteria for the management of material, products, and waste containing

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM). The standard applies to practices not covered by existing federal or state regulations that use, process, recycle or reuse, and distribute TENORM, including the generation and disposal of wastes that may result in making radioactivity more accessible to humans or the environment.

It addresses practices and operations that might concentrate and relocate radioactivity or make radioactivity more accessible such that members of the public may receive doses that would warrant the application of appropriate protective measures and corrective actions.

The standard adopts the principles of justification, optimization and limitation and provides supplemental guidance for their implementation.

The control of occupational exposures associated with TENORM is covered by the standard, although this aspect may already be addressed through requirements of industrial hygiene standards under current federal and state regulations.

The standard offers further informative guidance to facilitate its implementation, including background information for recognizing and evaluating practices that may have potential impacts on the public, workers, and the environment; various options for managing TENORM including supporting technical information.

Tuesday - 12:15-2:15 pm

PEP T-1 Laser Safety for Health Physicists

Ken Barat
Lawrence Berkeley National Laboratory

This course provides an overview of the elements of laser safety: laser physics, biological effects, hazard assessment, and control measures, as well as a concise distillation of the requirements in the ANSI Z136.1-2007 Standard for the Safe Use of Lasers. Non-beam hazards, emerging issues, and accident histories with lessons learned will also be covered. Course attendees will learn practical laser safety principles to assist in developing and conducting laser safety training, performing safety evaluations, and institutional elements. While some knowledge of laser hazards will be helpful, both experienced and novice health physicists with laser safety responsibilities will benefit from this course. Students will also find bringing their own copy of ANSI Z136.1-2007 a helpful reference

PEP T-2 Advances in Characterizing the Radiation Output of CT Scanners

Donovan Bakalyar
Henry Ford Hospital

Recently several research endeavors, both theoretical and experimental, have carefully examined CTDI (Computed Tomography Dose Index) and its derivatives such as CTDIvol and DLP and have found some limitations. The AAPM Task Force 111 has thoroughly reviewed

this research and has recently published a report which has recommended some changes in phantom design and measurement methodology which will better handle a more diverse array of CT designs. It is also hoped that measurements based on sound physical principles will more correctly characterize the radiation output of the scanner as well as have a more direct and transparent interpretation.

Currently, the x-ray dose delivery capabilities of a given scanner and the scanning parameters used for a particular study are characterized by CTDIvol, an index of the average dose delivered in the scanning region and by the Dose-Length Product (DLP) which multiplies CTDIvol by the length of the scan and is thus a rough indicator of the total radiation energy absorbed by the patient. Though the basic principles underlying these indicators are sound, the implementation of these principles has often taken a circuitous route sometimes resulting in confusion, misinterpretation and error.

The presentation will carefully review the contributors to patient dose during CT scans with an attempt to pare them down to their essentials. The difference between the beam width and nominal beam width (often depicted as NT) will be delineated. (This difference is often blurred, yet can be substantial.) The concept of equilibrium dose will be presented along with the determination of integral dose determined from readily measured parameters.

For theoretical reasons it is desirable to determine the integral of the entire dose profile in the phantom including that part due to scatter. Recent studies have shown that the current phantom is far too short to capture the entire scatter tail, even for a very narrow beam. With modern scanners, the beam width (in the z direction) is generally larger than for those in the past, escalating the problem. The current method uses a 10 cm long pencil chamber inside a stationary phantom to capture the central portion of the integral acquired during a single gantry rotation. An alternative (and more direct) method is to scan through the entire integral in the same manner that one would scan a patient. This allows the user to integrate over any portion of the dose profile including the entire integral when both tails are included. In the far past (prior to the incorporation of slip ring technology), performing this task would have been burdensome but with today's scanners the direct method is straightforward and allows for far more flexibility and completeness.

The values obtained using this methodology will properly characterize the radiation output of the scanner and therefore should prove to be useful as input parameters for more patient specific dose determinations (based, for example, on Monte Carlo calculations). (The feasibility of this will also be presented.)

PEP T-3 Managing Low-Level Radioactive Waste at an Academic Institution Without Breaking the Bank

Mike Zittle
Oregon State University

Management of low-level radioactive and mixed waste at academic and medical institutions is challenging due to the small quantities and wide variety of wastes generated. These organizations are often non-profit or government funded and 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 Agreement State NRC and EPA regulations without going over budget.

This course presents waste management strategies for various waste streams and processes including sanitary sewer disposal, decay-in-storage, bench top treatment of wastes, and the EPA mixed waste conditional exemptions. Techniques to minimize the generation of radioactive and mixed waste will be discussed as well as waste processing services available to reduce the volume of waste for disposal. Emphasis will be placed on the six R's: Reduce, Reuse, Recycle, Rethink, Refuse, and Repair. This course also highlights the importance of utilizing process knowledge, accurate sample analysis, and quality assurance to efficiently manage radioactive and mixed waste. Creative ideas will be presented that allow waste managers at academic and medical institutions to effectively raise awareness and train waste generators while also reducing the volume and cost of radioactive and mixed waste disposal.

PEP T-4 Training First Responders on Radiological Dispersal Devices (RDDs) and Improvised Nuclear Devices (INDs) Events

K.L. "Ken" Groves
S2-Sevorg Services, LLC

This PEP will present an overview of the current training the author is presenting to First Responders (firefighters, emergency medical technicians, law enforcement and others) who may encounter either a Radiological Dispersal Device (RDD or Dirty Bomb) or an Improvised Nuclear Device (IND) as a part of their Emergency Response activities. The emphasis of the training is putting the radiological/nuclear material in perspective as compared with other Weapons of Mass Destruction (WMD) materials such as chemical and/or biological weapon agents. A goal of the training is to help this First Responder Community understand that under almost all conditions, they can perform their primary mission of "putting out fires, rescuing and treating injured persons, and chasing bad guys" even in the presence of relatively large amount of radiological/nuclear contamination. The rare cases of high activity unshielded sources will be reviewed and explained. Current National/International guidance on dose "limits" will be discussed. The use of information contained in NCRP Commentary #19, "Key Elements of Preparing Emergency Responder for Nuclear and Radiological Terrorism," the New NCRP report entitled, "Response to Radiological and

Nuclear Terrorism: A Guide for Decision Makers," and the CRCPD "First Responders Handbook" will be used extensively in the presentation.

A discussion of the use of Time, Distance and Shielding as well as appropriate Personal Protective Clothing and how it will provide the needed protection while immediate actions take place early in an RDD/IND event will be reviewed. The use of appropriate radiation detection instrumentation, documented Standard Operating Procedures along with realistic training, drills and exercises are the key to a successful response to an RDD/IND event for this community of critical emergency responders.

PEP T-5 Introduction to Monte Carlo Methods for the Health Physicist (Part 2)

Peter F. Caracappa

Rensselaer Polytechnic Institute

Monte See PEP M-5 for full description.

Part II will cover the fundamental input components, code execution, and interpretation of output for the MCNP/MCNPX radiation transport codes.

Wednesday - 12:15-2:15 pm

PEP W-1 Counseling Workers – Part II, Tools for Effective Risk Communication

Ray Johnson

Dade Moeller Associates

Understanding the basis for worker upsets or fears can be helpful but may not be enough without effective tools for risk communication. The most powerful tool for worker counseling is to hear, identify, and reflect their feelings (Active Listening). One of the reasons that worker upsets or fears escalate is because no one really hears them. Perhaps this should not be surprising because most health physicists are not trained to hear feelings. This class will show how this tool can be acquired and implemented in a short time. There are two keys to listening: 1) feelings are more important than what is said, and 2) listening is more important than solving problems. We will explore whether our role in radiation safety is to be the "giver of answers" or to be a resource for assisting others in deriving their own answers. We will also consider a number of barriers to effective communication, including perceptions, images, feelings, resistance, values, social roles, decision preferences, and defensiveness. Insights on dealing with each of these barriers will be presented with applications to specific radiation worker scenarios provided by attendees. We will look at a sorting system for feelings and how to best respond to worker concerns and questions about radiation. This class will conclude with a list of things you can always say when you do not know what to say. We will practice these tools on communication scenarios which each attendee is invited to write down and bring with them.

PEP W-2 So now you're the RSO: Elements of an Effective Radiation Safety Program

Thomas L. Morgan

University of Rochester

Designation as a Radiation Safety Officer brings with it unique

opportunities and challenges. The author will offer insights on how to manage a radiation safety program from his 16 years experience as a RSO at medical, university, and industrial facilities. Regardless of the type of facility, number of radiation workers, or scope, an effective radiation safety program must be driven from the top down. Senior management must embrace the goals of the program. The RSO must have the trust of senior management as well as a good working relationship with line mangers and workers. These relationships are built on the integrity, knowledge, experience, and accessibility of the RSO. This talk will focus on the role of the RSO in achieving and maintaining an effective program.

PEP W-3 Testifying as a Health Physics Expert Witness
Lynn McKay
Blank Rome LLP

This course will provide practical and interactive guidance to health physicists who have been called to serve as an expert witness or are considering serving in that role. Course participants will learn the procedural and evidentiary rules for expert witnesses and effective expert witness communication skills. The course will feature videotape segments of actual expert testimony, and course participants will be invited to apply what they have learned by critiquing these segments, and formulating alternative ways that the expert information could have been more effectively presented.

PEP W-4 How the Legislature Really Works
Annette Glass
Plain English USA

A humorous, hands-on, interactive workshop that reviews what many of us learned in government class, but adds intriguing explanations of the nuances of legislative action unknown to the average citizen. This course also provides tips on how to communicate effectively with legislators and the people who influence them.

PEP W-5 Introduction to Monte Carlo Methods for the Health Physicist (Part 3)
Peter F. Caracappa
Rensselaer Polytechnic Institute

See PEP M-5 for full description.

Part III will be dedicated to sample problems for analyzing a radiation shielding problem using MCNP. The session will have opportunities to explore problems of interest to the participants.

Thursday - 10:45 am-12:45

PEP TH-1 Health Physics Concerns of Neutron Exposures, Criticality Safety and Criticality Accidents
David R. Simpson
Bloomsburg University

For most Health Physicists, neutron exposure is, at most, only a minimal issue in their workplace. However, with the potential terrorist threats of the use of nuclear materials, including weapons grade materials; it is important that all Health

Physicists have at least some understanding of neutron exposures, dosimetry and criticality safety. In this presentation, a brief introduction will be given describing sources of neutrons and the biological effects of neutron exposures. Next, a review of criticality safety will be given with special emphasis on areas where the Health Physicist may play a role, such as safely handling large quantities of special nuclear materials, spill control, etc. Finally, several criticality accidents will be reviewed and methods discussed on how neutron doses can be estimated based on both biological and physical neutron activation of materials from the exposed individuals.

PEP TH-2 Refresher for HPs Physiological Impacts of Respiratory Protection

Gary S. Kephart
Bechtel Jacobs Company LLC

Decontamination and decommissioning challenges associated with aging nuclear facilities continue to drive some health physics reliance upon respiratory protection. This Professional Enrichment Program will review the fundamental cardiopulmonary parameters and their respective inter-relationships with use of respiratory protection. This presentation will summarize key findings from the industrial hygiene, medical and ergonomic literature regarding how various physiologic functions are impacted by the use of respiratory protection. The objective is to refresh experienced health physicists on the various physiological stresses and their interrelationships with the use of respiratory protection in radiological control.

DISCLAIMERS

Bechtel Jacobs Company LLC is the managing contractor of the environmental management activities at the East Tennessee Technology Park, Oak Ridge, Tennessee, under contract DE-AC05-98OR22700 to the U.S. Department of Energy.

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PEP TH-3 Advanced Techniques and New Technologies Used in Emergency Response Exercises

Ken Kerns, Stephen Simpson
Iowa State University

Developing and maintaining the necessary skills of first responders presents emergency planners with many unique challenges. Genuine crisis situations are thankfully rare; however, this severely limits an emergency worker's ability to obtain on the job training. In response to this reality, emergency planners must use drills, simulations and exercises in

an effort to create a skill set that can quickly adapt to any crisis situation.

While emergency response exercises are inarguably necessary, it is not uncommon for these activities to become routine, boring and too narrow in scope. Exercises do not need to be boring or routine if creativity and innovation are incorporated into the development and implementation phases. Enhanced emergency response exercise planning will also push the limits of responder's skill sets, making them better prepared to address unanticipated situations.

Ken Kerns and Stephen Simpson have been involved in exercise planning for over 20 years, and as a result, have developed some advanced exercise tools and techniques that add efficiency and realism to players to ensure effective, credible and enjoyable exercises.

Kerns and Simpson will discuss, then demonstrate some of these advanced exercise tools, including exercise enhancements for field exercises, exercise control mechanisms used during region-wide functional exercises (involving over 600 people playing at 50 sites), and new tools to assist in effective evaluation of the exercise. Some of the tools were developed to meet the needs of specific exercises, while others have global application that can be used to improve exercise control and evaluation.

Participants of this PEP session will learn how to:

1. Create more realistic exercises and scenarios,

2. Improve player understanding of exercise concepts, limitations, and expectations,

3. Make exercise control more efficient, and;

4. Improve the evaluation and feedback process

If you are looking to "inject" more pizzazz into your exercises and enhance communications and exercise control, then this is the PEP for you.

PEP TH-4 A Fluoroscopy Credentialing Program for Physicians

Deirdre Elder
University of Colorado Hospital

Fluoroscopy is used for diagnostic purposes and to guide numerous diagnostic and therapeutic procedures in many departments of modern hospitals. Unfortunately, the training requirements for physicians who use fluoroscopic equipment are not always clearly delineated in the regulations or uniform within and between facilities. The Colorado Regulations Pertaining to Radiation Control were recently revised to include new training requirements for fluoroscopy users. In order to comply with the new regulations, which become effective July 1, 2010, the University of Colorado Hospital has developed and implemented a program to credential physicians to use fluoroscopy. An on-line training program must be passed before the privilege of using fluoroscopy is granted to any physician. In addition, all radiologic technologists are assigned the course to ensure consistency in procedures. Lessons learned from the medical staff office and the credentialing committee will be shared.

PEP TH-5 Fundamentals of Gamma Spectroscopy, Part 2 (Part 1 not included in the PEP program for 2010)

Doug Van Cleef
ORTEC/Advanced Measurement Technology, Inc.

This course offers a fast-paced review of the basic physics of gamma-ray detection, formulation of spectra, interpretation of spectral data, interferences, and calculations. Recent attendance at our Fundamentals of Gamma Spectroscopy course is recommended but not required.

Objective: Upon completion of this course, student will have a working knowledge of gamma radiation detection, gamma-ray spectra content, spectrum evaluation, and gamma-ray spectroscopy analysis.

Continuing Education Lectures (CEL)
Monday 28 June through Wednesday 30 June

Monday 7:00-8:00 AM

CEL1 ABHP Exam Fundamentals – Tips for Successfully Completing the Certification Process

Cheryl Olson, Andy Miller, Patricia Miligan

Dominion KPS, Vanderbilt University, US NRC

This presentation will discuss the advantages of being certified as well as the fundamentals of the ABHP exam process – from submission of the exam application to completion of the Part 2 examination. Topics of discussion will include:

* What are qualifying academic requirements?

* Why require a degree?

* What is meant by "professional level" experience?

* How are the exams (Part 1 and Part 2) prepared?

* How is the passing point determined?

* What are the keys to good performance on the exam?

* What pitfalls exist that detract from good exam performance?

This presentation will help persons interested in certification to prepare an application that will accurately reflect the applicant's education and experience as well as providing tips for preparing to take the exam and answering part 2 questions in a format that promotes awarding partial credit. Persons who are already certified may gain insight into the process and identify areas where they would be willing to assist in certification process. The material presented consolidates pertinent exam policy/procedure into an easily digestible format, offering real world examples of good and poor performance.

CEL2 Update on Medical Internal Radiation Dosimetry: MIRD Committee Recommendations for Unifying MIRD and ICRP Formulas, Quantities, and Units

Darrell R. Fisher, Wesley E. Bolch

Pacific Northwest National Laboratory, University of Florida

The scientific foundations underlying the MIRD schema for medical internal dosimetry and the general framework established by the International Commission on Radiological Protection (ICRP) for occupational internal dosimetry are mathematically similar, even though they appear outwardly to be substantially different. The 2009 recommendations of the MIRD Committee (Pamphlet No. 21) provide a revised framework for unifying the ICRP and MIRD equations, models, and terminology. The result is a general schema for internal dosimetry, consistent for both nuclear medicine and radiation protection, using standardized formulas, nomenclature, quantities, and units. The 2009 MIRD recommendations clarify the concept and application of absorbed dose for deterministic effects in patients (organs, tissues, tumors, and the whole body) from medically administered

radiopharmaceuticals. The radiation protection quantities equivalent dose and effective dose are reserved for evaluating stochastic risks in groups of patients and health care workers. A new quantity and unit are proposed for comparing deterministic effects (such as cell death, impaired organ function, and tumor response) following high doses, high dose-rates, and high-LET radiation qualities associated with targeted radionuclide therapy (particularly for alpha emitters and Auger-electron emitters). Unifying the MIRD and ICRP structural framework should help eliminate confusion and the mixing of units such as quality factor (Q), relative biological effectiveness (RBE), and radiation weighting factor (wR) for expressing the biologically relevant dose. This course is relevant to health physicists who use internal dosimetry for retrospective dose assessment, prospective treatment planning, and risk analysis. This course is recommended for practicing medical, regulators, and administrators responsible for radiation safety in medical centers and for the safe use of radiopharmaceuticals.

CEL3 ANSI N43.1 Standard Draft: Radiation Safety for the Design and Operation of Particle Accelerators *

James C. Liu, Lawrence S. Walker
SLAC, LANSCE, Los Alamos National Laboratory

* Work supported by Department of Energy contract DE-AC03-76SF00515

The latest development and status of the ANSI N43.1 Standard "Radiation Safety for the Design and Operation of Particle Accelerators" are presented. The Standard sets forth the requirements and recommendations for accelerator facilities to provide adequate radiation protection for the workers, the public and the environment. The Standard applies to the design, installation, commissioning, operation, maintenance, upgrades and decommissioning of accelerator facilities, i.e., the complete life cycle of a facility. The Standard specifies the requirements and recommendations for both the management and the technical aspects of the radiation safety program, graded to the complexity and hazard levels of the facility. This Standard is applicable to all accelerator facilities, except facilities utilizing accelerators solely for medical applications (human or veterinary).

Chapter 2 of the Standard provides the definitions of common terms. Chapter 3 specifies the radiation safety programs for the accelerator facilities. Chapter 4 provides details of the requirements and recommendations for the Radiation Safety System(s) (RSS) which are used to control prompt radiation hazards. The RSS includes the Access Control System (ACS) and Radiation Control System (RCS). Chapter 5 describes the details of the ACS, while Chapter 6 describes the details of the RCS. Chapter 7 covers the accelerator operations. The Operational Radiation Safety program is described in Chapter 8. Chapter 9 covers the personnel training. There are five appendices to provide detailed guidance and resources in

addressing the five key issues: 1) development of the Safety Assessment Document, 2) design and implementation of the interlocked-type ACS systems, 3) decommissioning program, 4) measurements of radiation and radioactivity, and 5) safety standards for commercially available and/or production-type accelerators.

CEL4 Overdose of Patients Receiving CT Scans

Thomas L. Morgan
University of Rochester

Recent news reports and FDA advisories indicate that patients have been inadvertently overexposed during certain CT scan procedures. This talk will discuss background information about how CT scanners operate, how dose is estimated, and what is currently known about these exposures. The focus will be on bringing the health physicist up to speed on this rapidly changing technology and what can be done to prevent such mishaps in the future.

CEL5 Radiological Releases and Environmental Monitoring at Commercial Nuclear Power Reactors

Jason Harris
Idaho State University

This lecture will present an overview of the current issues facing health physics professionals at commercial nuclear power reactors. Specifically this presentation will focus on environmental (public) radiation protection found at these reactors. Topics will center on radioactive effluent technical specifications and radiological environmental monitoring programs (RETS-REMP). In particular, ground water monitoring and protection initiatives, 3H, 14C and regulation updates and changes will be presented. Radiological environmental monitoring practices in different countries will also be discussed.

CEL6 Dose Reconstruction for Radiation Epidemiology

Daniel J. Strom
Pacific Northwest National Laboratory

Professional health physicists need to understand the scientific basis for radiation protection, including the basis for modeling radiation health effects in people following exposure to ionizing radiation. This presentation highlights the practices and limitations of reconstructing radiation doses to individuals who are subjects of radiation epidemiology. Epidemiology is the study of patterns of health, disease, and mortality in human populations, and associating those patterns with various risk factors. Epidemiologists take into consideration known risk factors other than radiation, including date of birth, sex, race, smoking status, socioeconomic status, and disease codes, as well as dates of hire, exposure, diagnosis, and, in mortality studies, death. In many older studies, researchers classified subjects crudely as “exposed” or “unexposed,” or using surrogate measures such as radon decay product exposures in working level months or radium body burden at time of death. Modern epidemiologists require annual absorbed doses (with no RBE,

Q, or wR) to various tissues and organs, separated by radiation type and even by LET, e.g., separating neutron doses into high- and low-LET components. For occupational studies, there may be personnel monitoring records or workplace monitoring records that can be associated with individuals. Often, medical and environmental radiation exposures are considered in occupational studies. In the past couple of decades the effects of uncertainty in doses has been recognized. Classical (measurement) and Berkson (grouping) errors lead to uncertainties in doses that are reconstructed for epidemiology. Furthermore, it has been shown that shared and unshared uncertainties have profoundly different effects on inferred dose-response relationships. Evaluation of autocorrelation of annual doses within individuals over time recognizes that doses in one year may not be statistically independent of doses in an earlier year. Management of these uncertainties for radiation epidemiology differs from that for radiation protection dosimetry or for dose reconstruction done in support of compensation decisions. The needs of the customer, that is, the epidemiologists and biostatisticians, must be considered at every phase of dose reconstruction.

2010 Exhibit Hall Floor Plan

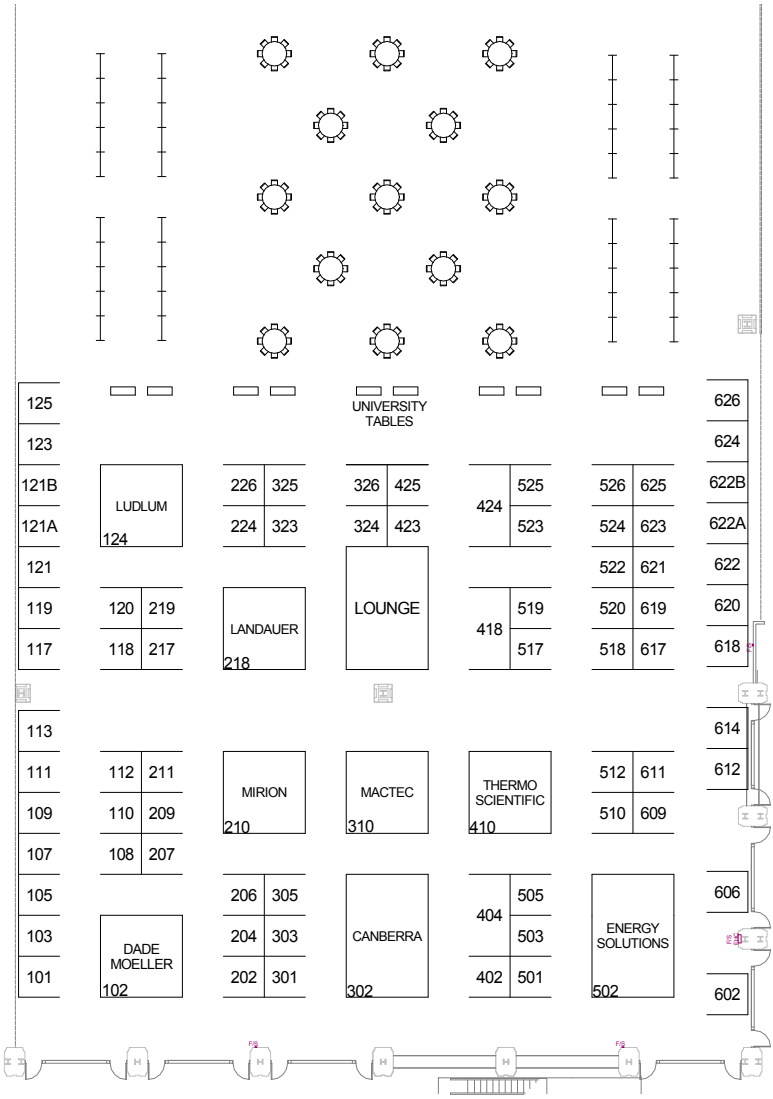

Exhibit Hall Hours

Monday	Noon - 5:00 pm
Tuesday	9:30 am - 5:30 pm
Wednesday	9:30 am - Noon

2010 Exhibitors

2011 Annual Meeting Palm Beach **Booth: 121B**

2011 Midyear Meeting Charleston, SC **Tabletop**

AAHP/ABHP **Booth: 622A**

Aloka Co. Ltd. **Booth: 123**
6-22-1 Mure,Mitaka-shi
Mitaka,Tokyo,181-8622, Japan
81-422-45-6465; FAX: 81-422-45-4058

Aloka's radiation measuring instruments are used in various fields including nuclear power, medicine, biochemistry, and pharmacology and play crucial roles in radiation (safety) management, research, and examination. As the pioneer in the field of radiation measurement, we have contributed greatly to the peaceful use of atomic energy and the development of isotope technology. With the slogan "Science and Humanity," we will continue to assist the progress of medicine and energy for the new age.

Ameriphysics, LLC **Booth: 324**
11634 Turkey Creek Rd.
Knoxville, TN 37934
865-654-9200; FAX: 865-531-0092

Ameriphysics is a full-service radiological and waste solutions provider. Our personnel exhibit a wide variety of radiation protection and waste management experience. From simple laboratory surveys to complex cyclotron removals and MARSSIM-based decommissioning projects; Ameriphysics has the experience necessary to complete your project on time and within budget.

Apantec LLC/Fuji Electric Systems **Booth: 623**
4500 North Cannon Ave
Lansdale, PA 19446
267-436-3991; FAX: 215-362-5343

Fuji Electric Systems and Apantec LLC will jointly display an Access Control System designed for detection and monitoring radiation exposure to personnel working in restricted areas of nuclear power stations and nuclear facilities. Demonstarions of the APD (NRF Series) dosimeter sytem, computer with dosemeter reader with an entrance/exit turnstile, and a hand and foot monitor will be featured.

Arrow-Tech Inc. **Booth: 112**
PO Box 1240, 417 Main Ave West
Rolla,ND,58367
701-477-6461; FAX: 701-477-6464

Arrow-Tech Inc. is the manufacturer of the Direct-Reading Dosimeter. Arrow-Tech handles a full line of Radiation Detection equipment and maintains customers throughout the world providing quality reliable durable products and service. Industries served include the Health Physics Homeland Security NDI, Industrial & Medical Radiology and 1st Responders. Arrow-Tech provides calibration services.

Berkeley Nucleonics Corporation **Booth: 110**
2955 Kerner Blvd
San Rafael,CA, 94901
415-453-9955; FAX: 415-453-9956

Berkeley Nucleonics Corporation is a leading manufacturer of precision electronic instrumentation for test measurement and nuclear research. BNC has its corporate headquarters in San Rafael California with several

additional manufacturing facilities and sales offices located throughout the United States.

Best Medical **Booth: 522**
7643 Fullerton Road
Springfield, VA 22153
703-451-2378; FAX: 703-451-2378

Best Medical International, a family of companies known as TeamBest, is dedicated to affordable, quality healthcare for cancer diagnosis and treatment. The product lines of TeamBest include systems for teletherapy, brachytherapy, cardiology, radiology, quality assurance, radiation measurements and health physics. Best Medical has all your radiation protection needs.

Bionomics, Inc. **Booth: 510**
PO Box 817
Kingston, TN 37763
865-220-8501; FAX: 865-220-8532

Bionomics provides generators with services associated with the disposal of radioactive and mixed wastes. Emphasis is on proven, cost effective methods that offer a reduction in long term liabilities. Other services include surveys, sampling and project oversight of decontamination and decommissioning projects.

Bladewerx LLC **Booth: 305**
103 Rio Rancho Dr NE, Suite C4
Rio Rancho, NM 87124
505-892-5144; FAX: 505-890-8319

Bladewerx and its subsidiary, Shieldwerx, provide instrumentation, custom software, neutron and gamma shielding, and neutron activation foils to the radiation protection and measurement industry

Canberra Industries **Booth: 302**
800 Research Parkway
Meriden, CT 06450
203-639-2148; FAX: 203-235-1347

CANBERRA is the world's leading supplier of analytical instruments, systems and services for radiation measurement. Applications for CANBERRA offerings include health physics, nuclear power operations, Radiation Monitoring Systems (RMS), nuclear safeguards, nuclear waste management, environmental radiochemistry and other areas. The company has the broadest array of Health Physics capabilities in the industry. HP related products include a full range of gamma and alpha spectroscopy equipment, personnel contamination monitors, hand held survey instruments for alpha, beta, gamma and neutron measurement, whole body counters and area monitors. The company also offers a full range of services including repair and maintenance, training and expert data review.

CBI Polymers **Booth: 501**
1946 Young Street, Suite 288
Honolulu, HI 96826
808-949-2208; FAX: 808-949-2209

CBI Polymers provides DeconGel™ which is the leading decontamination solution currently available for the radiological and chemical clean-up and spills. It is safe, user-friendly, and is able to effectively contain, trap, encapsulate and decontaminate a broad range of radioisotopes and chemicals on different substrates in a simple, easy, no-preparation process.

CDC - Radiation Studies Branch **Booth: 524**
4770 Buford Highway NE, MS F-58
Atlanta, GA 30341
404-488-3800

The Centers for Disease Control and Prevention, Radiation Studies Branch, presents the Radiological Emergency Toolkit for Public Health Officials. Please stop by booth 524 to request a free toolkit, or send an email with your name and shipping address to cdcinfo.cdc.gov.

Chase Environmental Group Inc. **Booth: 217**
11450 Watterson Ct.
Louisville, KY 40299-2389
865-481-8801; FAX: 865-481-8818

Chase Environmental Group, Inc. is a full-service, decontamination, decommissioning, remediation, and waste management firm, providing safe, high quality, practical, cost effective solutions to your environmental needs.

CHP Consultants **Booth: 624**
100 Chatham Lane
Oak Ridge, TN 37830
865-387-0028; FAX: 866-491-9913

Conference of Radiation Control Program Directors (CRCPD) **Booth: 622**
1030 Burlington Lane, Suite 4B
Frankfort, KY 40601
502-227-4543; FAX: 502-227-7862

Dade Moeller & Associates **Booth: 102**
1855 Terminal Drive, Suite 200
Richland,WA,99354
509-946-0410; FAX: 509-946-4412
www.moellerinc.com

Dade Moeller & Associates is a nationally-recognized consulting firm specializing in radiological & nuclear safety, public & environmental health protection, occupational safety & health, and radiation safety training. We provide the full range of professional and technician services in radiation protection, health physics, and worker safety to government and commercial nuclear clients.

Eastern Idaho Technical College **Booth: 612**
1600 S 25th E
Idaho Falls, ID 83404
208-524-3000; FAX: 208-524-0429

Eastern Idaho Technical College is accredited by the Northwest Commission on Colleges and Universities, an institutional accrediting body recognized by the Council for Higher Education Accreditation and/or the Secretary of the U.S. Department of Education. The Radiation Safety Program of study is a Technical Certificate program which teaches entry-level skills required for employment in the nuclear industry as a Radiological Control/Health Physics Technician."

Eckert & Ziegler Analytics **Booth: 424**
1380 Seaboard Industrial Blvd.
Atlanta, GA 30318
404-352-8677; FAX: 404-352-2837

Eckert & Ziegler Strahlen- und Medizintechnik AG, headquartered in Berlin, is a globally active isotope technology and holding company for a number of specialized subsidiaries that process radioisotopes as well as develop, manufacture and sell isotope technology components, medical technology equipment and related products.

Eckert & Ziegler Analytics, located in Atlanta, GA and Eckert & Ziegler

Isotope Products, located in Valencia, CA supply high quality, NIST-traceable radioactive reference and calibration sources and standardized solutions for the calibration of radiation measurement instruments. Radiochemical performance evaluation samples are provided quarterly for effluent and environmental monitoring programs.

The recent acquisition of Nuclitec GmbH, Braunschweig, Germany, formerly QSA Global GmbH and Nuclitec, Inc., Burlington, MA, formerly part of QSA Global, Inc. added the Isotrak brand product range. Isotrak products include high quality anodized wide area reference sources and a range of instruments including the Teletector 6112B/M

Eckert & Ziegler is the world's largest supplier of high quality NIST-traceable radioactive standards. We operate 3 accredited calibration laboratories, 2 in the USA and one in Germany.

Ecology Services Inc. Booth: 303
10220 Old Columbia Road
Columbia, MD 21046
410-381-2600; FAX: 410-381-2602

Ecology Services Inc. Provides in depth services to waste generators to include waste minimization, characterization, tracking, packaging, manifesting, complete shipment preparation. Remedial Services, facility decon/decommissioning, close outs (MARSSIM). We support the requirements of both large and small generators, tailoring services specific to customer needs. While committing to safety, regulatory compliance, environmental compliance, and complete customer satisfaction.

Eichrom Technologies/ Booth: 101
Nuclear Power Outfitters
1955 University Lane
Lisle,IL,60532
630-963-0320; FAX: 630-963-1928

Energy Laboratories Inc Booth: 519
PO Box 30916
Billings, MT 59107
406-252-6325; FAX: 406-252-6069
www.energylab.com

Energy Laboratories is a full service and analytical laboratory whose continued success depends on quality of service and integrity of data. As a trusted resource since 1952, Energy Laboratories provides independent, quality-controlled, and confidential analytical services for testing of water, waste, soil, air, and petroleum product samples. Visit our website www.energylab.com.

Energy*Solutions* Inc. Booth: 502
423 W. 300 S, Suite 200
Salt Lake City, UT 84101
801-649-2102; FAX: 801-413-5690

Energy*Solutions* is an international nuclear energy Services Company headquartered in Salt Lake City, Utah. Divisions include Federal Services, Commercial Services, International Division and Logistics, Processing and Disposal. Energy*Solutions* takes great pride in the work we do and is committed safety first to support energy independence, reduced carbon emissions, environmental protection.

Femto-Tech, Inc Booth: 111
25 Eagle Court
Carlisle, OH 45005
937-746-4427; FAX: 937-746-9134

Femto-TECH, INC. is a leader in the design and manufacture of continuous radon monitors and real time tritium instrumentation.

F&J Specialty Products, Inc. **Booth: 518**
404 Cypress Road
Ocala, FL 34472
352-680-1177; FAX: 325-680-1454

F&J is a manufacturer of traditional and microprocessor controlled air sampling systems, airflow calibrators, accessories and consumables. Products include High Volume, Low Volume and PAS air samplers, filter media and radioiodine collection cartridges. Most instruments comply with ANSI/UL electrical safety standards.

Fluke Biomedical **Booth: 301**
6045 Cochran Road
Cleveland, OH 44139
440-248-9300; FAX: 440-349-2307
www.FlukeBiomedical.com

Fluke Biomedical offers a complete line of quality assurance test and simulation products for biomedical/clinical engineers and imaging technicians, along with a range of solutions for managers to optimize their resources. From electrical-safety testers, patient simulators and performance analyzers to automation systems, we provide the benchmark in quality and value.

Gamma Products, Inc. **Booth: 617**
7730 W. 114th Place
Palos Hills, IL 60465
708-974-4100; FAX: 708-974-0071

Gamma Products, Inc. has been designing and manufacturing scientific instruments for 45 years. Our product line includes: low background a/b automatic proportional counting systems, low background a/b manual proportional counting systems, a gas free automatic a/b counting system, RA226/8 & gamma automatic sample changers, lead or steel counting and storage shields.

Gel Laboratories LLC **Booth: 226**
2040 Savage Road
Charleston, SC 29414
843-906-5929; FAX: 843-766-1178

GEL is the largest commercial environmental laboratory in the country. Our full service laboratory performs radiochemical characterization of environmental medium, bioassay, & mixed waste for DOE & Nuclear Power. Instrumentation includes: Alpha spectrometry, Liquid scintillation, Gamma spectrometry, Gas flow proportional counting, X-Ray spectrometry, Radon emanation, Laser kinetic phosphorimetry & ICP-MS.

G/O Corporation **Booth: 520**
70161 Highway 59, Suite E
Abita Springs, LA 70420
985-809-8085; FAX: 985-809-7440

G/O Corporation is a supplier of both nuclear and industrial safety equipment. G/O provides health physics supplies, rad-waste reduction items, many custom signage and barrier products.

GTRI **Booth: 119**
995 L'Enfant Plaza, Suite 1400
Washington, DC 20585
202-406-1212; FAX: 202-863-2861

The Department of Energy's National Nuclear Security Administration (DOE/NNSA) Global Threat Reduction Initiative (GTRI) works to prevent the acquisition of nuclear and radiological materials for use in weapons of mass destruction and acts of terrorism. GTRI works in cooperation with federal, state, and local agencies and private industry to install security upgrades on high priority nuclear and radiological materials at civilian sites in the United States.

Health Physics Instruments **Booth: 209**

330 S Kellogg Avenue, Suite D
Goleta, CA 93117
805-964-3615; FAX: 805-964-3162

Health Physics Instruments manufactures instruments and detectors that measure gamma, neutron, beta, and alpha radiation. The product line includes portable Geiger-counters through sophisticated fixed monitors and includes rem meters, dosimeters, and multichannel analyzers. HPI has been serving the Health Physics community for over 35 years.

HI-Q Environmental Products Co. **Booth: 402**

7386 Trade Street
San Diego, CA 92121
858-549-2820; FAX: 858-549-9657

HI-Q Environmental Products Company has been a leading Manufacturer of Air Sampling Equipment, Systems & Accessories since 1973. Our product line includes: Continuous duty high & low volume air samplers, air flow calibrators, radioiodine sampling cartridges, collection filter paper, combination filter holders, and complete stack/fume hood sampling systems including the Shrouded Probe designed per ANSI N13.1 1999.

Hopewell Designs, Inc. **Booth: 505**

5940 Gateway Drive
Alpharetta, GA 30004
770-667-5770; FAX: 770-667-7539

Hopewell Designs, Inc. provides systems and solutions for irradiation applications, X-ray inspection, and radiation shielding. We offer standard products and custom designs to meet our customers' requirements.

HPS Journal **Booth: 121A**

IAEA Careers - Argonne National Laboratory **Booth: 517**

9700 South Cass Avenue
Argonne, IL 60439
630-252-5491; FAX: 630-252-3193

The International Atomic Energy Agency (IAEA) in Vienna, Austria is the world's center for cooperation in the nuclear field committed to promoting safe, secure and peaceful uses of nuclear technology. IAEA offers opportunities to engage current, meaningful issues of global peace, security and development while working in a multicultural workplace.

ICx Radiation **Booth: 425**

100 Midland Road
Oak Ridge, TN 37830
865-220-8700; FAX: 865-220-7181

ICx Radiation develops leading edge radiation detection and identification devices. Our handheld systems can locate, measure and identify specific radioactive sources as well as discriminate between naturally occurring, medical related and harmful sources. Our stationary, high performance spectral systems detect, monitor and analyze possible radiation sources either covertly or overtly.

IN/US Systems, Inc **Booth: 326**

1040 E Brandon Blvd
Brandon, Fl 33511
800-875-4687; FAX: 813-620-3708

IN/US Systems was founded in 1990 to design, manufacture, sell, and service instruments used for the low-level measurement of radioactivity in research laboratories. That remains our primary focus to this day. Our innovative, unrivalled product set makes us the leading provider for radioisotope detection instrumentation

and radiochromatography software. Our products support various counting techniques used in the research laboratory.

J.L. Shepherd & Associates **Booth: 323**

1010 Arroyo Ave.
San Fernando, CA 91340-1822
818-898-2361; FAX: 818-361-8095

Biological research, blood component, sterilization and process irradiators. Gamma, beta and neutron instrument calibration facilities. Automated computer controls and databases. Irradiator/Calibrator IC security upgrades, service, repair, relocations and decommissioning. Hot cell manipulators, windows and lead glass available.

K & S Associates Inc. **Booth: 609**

1926 Elm Tree Drive
Nashville, TN 37210
615-883-9760; FAX: 615-871-8056

K&S is accredited by the HPS as an Accredited Instrument Calibration Laboratory (AICL) for calibration of instruments from15uR/h to 1000 R/h for 137Cs and other rates for 60Co and x-rays from 30 to 250 kVp. K&S is also accredited by the AAPM and the American Association for Laboratory Accreditation.

Lab Impex Systems Ltd. **Booth: 423**

Impex House, 21 Harwell Road
Nuffield Industrial Est, Poolet
Dorset, BH17 OBE, United Kingdom BH21 1QU
44(120)-2684-848; FAX: 44(120)-2683-571

Instruments for Alpha-Beta Continuous Air Monitoring (the SmartCAM), Area Gamma Monitoring, Noble Gas Monitoring and Iodine Monitoring. Complete systems for Stack and Duct Monitoring and Facility wide networks. Applications within Nuclear, Industrial and PET.

Landauer Inc. **Booth: 218**

2 Science Rd.
Glenwood, IL 60425
708-755-7000; FAX: 708-755-7011

Landauer is the world's largest radiation dosimetry service provider utilizing the proprietary OSL technology found in both Luxel+ and InLight. InLight is a turnkey onsite analysis system that meets routine personnel monitoring and emergency response requirements. Both dosimeter types are NVLAP and DOELAP accredited. Landauer's comprehensive diagnostic evaluation and reporting is backed by over 50 years' experience.

Laurus Systems, Inc. **Booth: 219**

3460 Ellicott Center Dr., Suite 101
Ellicott City, MD 21043
410-465-5558; FAX: 410-465-5257

LAURUS Systems specializes in the sales and service of quality radiation detection instruments to emergency responders, health physics, homeland security, the military, scrap metal/ recycling and the nuclear industry. LAURUS is a private, 100% woman-owned small business concern that also provides training, maintenance and calibration services.

Los Alamos National Laboratory/Offsite Source Recovery Project **Booth: 117**

Bikini Atoll Road, SM30, MS: J552
Los Alamos,NM,87545
505-667-9017; FAX: 505-665-7913

The mission of the U.S. Radiological Threat Reduction (US RTR) program is to carry out efforts within the United States to reduce threats posed by high-

risk radioactive materials that could be used in a radiological dispersal device (RDD) also known as a “dirty bomb.” The core activity of the US RTR program is recovering high-risk radioactive sealed sources declared excess and unwanted by domestic licensees. These activities are carried out under the Off-Site Source Recovery Program (OSRP) which is responsible for identifying recovering and storing- on an interim-basis- U.S. origin domestic and international radioactive sealed sources; and other radioactive materials that pose a potential risk to health safety and national security.

For more information on the project please visit the OSRP website.

Ludlum Measurements Inc **Booth: 124**

501 Oak Street, PO Box 810
Sweetwater,TX,79556
325-235-5494; FAX: 325-235-4672

Ludlum Measurements Inc. has been designing manufacturing and supplying radiation detection and measurement equipment in response to the worlds’ need for greater safety since 1962. Throughout its nearly five decade history it has developed radiation detection technologies and instruments in support of enhancing the safety of personnel the environment and securing borders.

MACTEC, INC. **Booth: 310**

14062 Denver West Parkway, Ste 300
Golden, CO 80401
303-273-5071; FAX: 303-273-5000

MACTEC is one of only a few US organizations with an NRC license and the technical expertise to plan and execute complex radiological projects. From decommissioning planning and MARSSIM-based surveys to strict radiological engineering and the advantage of innovative scanning spectrometer radiation detection technology, MACTEC meets project goals and saves clients time and money while meeting the demands of today’s complex regulatory requirements.

Master-Lee Hanford Corporation **Booth: 121**

1904 Airport Way
Richland,WA,99354
509-943-2949; FAX: 509-943-2860

Master-Lee Decon Services (MLDS) provides contracted decontamination and industrial cleaning services to nuclear and non-nuclear industry. We can provide many different technologies, techniques, processes and disciplines to support our customer’s needs. We offer complete decontamination services for outages or continuous on-site maintenance.

Mirion Technologies **Booth: 210**

5000 Highlands Parkway, Suite 150
Smyrna, GA 30082
770-432-2744; FAX: 770-432-9179

Mirion Technologies (MGPI), Inc. provides a full range of instrumentation and engineering services for health physics applications and radiation monitoring systems for all nuclear facilities and civil defense markets. We are #1 in North America in electronic dosimetry.

Mirion Technologies Dosimetry Services Division is a worldwide leader in radiation dosimetry services. Offering the broadest array of dosimetry products in the marketplace, under the Global Dosimetry Solutions brand, we are fully accredited through several well-known organizations.

MJW Technical Services Inc. **Booth: 404**

243 Root Street, Suite 100
Olean, NY 14760
716-372-5300; FAX: 716-372-5307

MJW Technical Services, Inc. provides high quality and timely calibrations and repairs for all types of radiation detection equipment. MJWTS is the Ludlum Measurements Authorized Eastern U.S. Service Center, SAIC Dosimeter Service Center and the Wm B. Johnson Authorized Service Center. With our new state-of-the-art calibration facility strategically located in the northeastern U.S. we can quickly and efficiently service our customers. In addition to instrument calibrations MJWTS is the Northeastern sales distributor for Wm B. Johnson instruments check out our website at www.mjwts.com or call toll free 1-866-300-3MJW for more information.

NRRPT **Booth: 620**

PO Box 3084
Westerly, RI 02891
401-637-4811; FAX: 401-637-4822

Nuclear News **Booth: 619**

American Nuclear Society
555 North Kensington Avenue
LaGrange Park, IL 60526
708-579-8226; FAX: 708-352-6464

Nuclear News is the monthly membership magazine of the American Nuclear Society, whose diverse membership of nearly 11,000 engineers, health physicists, scientists, administrators, and educators represents 1600 corporations. Nuclear News has been an integral part of the advertising plans of nearly 1000 companies to promote their capabilities.

Oak Ridge Associate Universities **Booth: 120**

MS-11, PO Box 117
Oak Ridge,TN,37831
865-576-3576; FAX: 865-574-3687

ORAU provides a variety of services in the radiological sciences: Training environmental surveys decommissioning epidemiology and emergency response.

ORTEC **Booth: 418**

801 S. Illinois Ave
Oak Ridge, TN 37831
865-483-2124; FAX: 865-425-1380

ORTEC celebrates fifty years providing solutions for a wide variety of Nuclear Detection Applications. Our team of highly qualified scientists and engineers are dedicated to providing measurement system solutions for Homeland Security, Waste Management, Personal Monitoring, In-Situ measurements, and Radiochemistry Laboratory Applications. Visit our booth to see a demo of our latest products.

Pacific Northwest National Laboratory **Booth: 523**

PO Box 999, MS K3-54
Richland, WA 99352
509-375-4376; FAX: 504-375-3618

Pacific Northwest National Laboratory performs research for DOE, other government agencies, and industry to deliver science and technology to meet national needs. PNNL draws upon its multidisciplinary

expertise to research, develop and deploy solutions to energy and environmental challenges including nuclear energy, environmental health, and remediation. Visit us at www.pnl.gov.

PerkinElmer **Booth: 109**
710 Bridgeport Ave
Shelton, CT 06484
203-402-6973

PerkinElmer is committed to the safe use and handling of NEN® radiochemicals and radionuclides. Made in the USA and delivered globally, our NEN radiochemicals arrive safely in our exclusive NENSure™ packaging. Also, we provide the complete detection solution for monitoring and cleaning radioactive spills or contamination…all under one roof.

Philotechnics, Ltd. **Booth: 614**
2328 Bluff Rd.
Harriman, TN 37748
865-483-1551; FAX: 865-483-1530

Philotechnics, Ltd. is the premier waste management group in the country. We provide turn-key LLRW and Mixed Waste Brokerage Services, D&D/Health Physics Services, and Industrial Hygiene Services. Philotechnics has licensed facilities in Oak Ridge, TN and San Diego, CA, as well as offices in Boston, MA, Pittsburgh, PA, and Idaho Falls, ID.

Protean Instrument Corporation **Booth: 211**
231 Sam Rayburn Pkwy
Lenoir City, TN 37771
865-717-3456; FAX: 865-717-3456

Protean Instrument Corporation is a leading supplier in high performance alpha/beta counting systems and the only company 100% dedicated to the manufacture of these systems. We manufacture a wide range of models, including automatic, manual, single detector, multi-detector, windowed and windowless. We deliver twice the performance!

Qal-Tek Associates **Booth: 626**
3998 Commerce Circle
Idaho Falls, ID 83401
208-523-5557; FAX: 208-524-8470

Qal-Tek Associates is an A2LA accredited calibration facility for all types of radiological instrumentation. We specialize in offering high quality calibrations at very competitive pricing. Additionally, we offer a complete list of radiological support services including program assessments, training, source handing and removal, site inspection, decontamination and disposal.

Rad Source Technologies, Inc. **Booth: 606**
480 Brogdon Road, Ste 500
Suwanee, GA 30024
770-887-8669; FAX: 678-302-7510

Rad Source Technologies is currently the only company in the world supplying a comprehensive line of commercial X-ray radiation products designed to replace self-shielded gamma sources. Current products are used for the irradiation of small animals, cells, sterile insect technique (SIT) applications, viral inactivation, and various other scientific applications.

RADeCo, Inc. **Booth: 107**
17 West Parkway
Plainfield, CT 6324
860-564-1220; FAX: 860-564-6631

Air sampling equipment and filter media.

Radiation Safety Associates **Booth: 204**
PO Box 107,19 Pendleton Drive
Hebron,CT,6248
860-228-0487; FAX: 860-228-4402

Radiation consulting services radiochemical analysis/lab services instrument calibration & repair decontamination & decommissioning professional publications (journals & reference books) and software and detection equipment for HPs.

Radiation Safety & Control Services Inc. **Booth: 207**
91 Portsmouth Avenue
Stratham,NH 03885
800-525-8339; FAX: 603-778-6879

RSCS is a leader in Radiological Services including Instrument Sales Calibration and Repair HP Training and Consulting. We specialize in: decommissioning LTP/FSS support regulatory compliance Groundwater Investigations REMP services and assessments. Specialty products include Survey Meter Simulators and HP Software.

Radiation Solutions Inc **Booth: 503**
386 Watline Ave
Missauga, Ontario, L4Z 1X2 Canada
905-890-111; FAX: 905-890-1964

Radiation Solutions Inc is a manufacturer of low level radiation detection instruments. Products include handheld nuclide identification (RIID) units, mobile systems for land vehicle, marine, airborne and stationary monitoring. Applications range from environmental, emergency response, security and geological mapping. The various systems offer Survey/ Search, ID, Mapping and Directional capabilities. In addition, vehicle portal monitoring systems are also produced primarily for the scrap metal recycling industry.

RMD Instruments Corp **Booth: 621**
44 Hunt Street
Watertown, MA 02472
617-668-6900; Fax: 617-926-9743

RadCam Spectroscopic Gamma-Ray Imaging System. Makes images of gamma radiation superimposed over a video image of the same field of view. Intensity of gamma radiation is presented in color. Progressively brighter colors correspond to higher gamma activity for the user-set energy region-of-interest. Additional, emerging, nuclear detector technologies.

Saint-Gobain Crystals, **Booth: 618**
17900 Great Lakes Parkway
Hiram, OH 44234
440-834-5600; FAX: 440-834-7680

Saint-Gobain Crystals provides innovative crystals and detectors for gamma and neutron detection solutions. This includes detectors with sodium iodide and other crystals, cast and liquid plastic scintillators and fibers, and gas-filled detectors. Notable brands include Bicron, Gamma Labs and our new BrilLanCe® and PreLude®420 scintillators.

Saphymo GmbH **Booth: 525**
Heerstrasse 149
Frankfurt Main, 60488 Germany
49-69-9765140; FAX: 49-69-765327

S.E. International Inc. **Booth: 206**
PO Box 150
Summertown,TN,38483-0039
931-964-3561; FAX: 931-964-3564

S.E. International Inc. is the manufacturer of the Radiation Alert® product line offering handheld analog and digital ionizing radiation detection instruments and multi-channel analyzers for surface and air contamination. Proven to be reliable in the; environmental laboratory

research health physics industry hazmat educational and domestic preparedness fields.

Solutient Technologies, LLC **Booth: 512**
6616 Promway Ave. NW
North Canton, OH 44720
330-497-5905; FAX: 330-497-2045

Spectrum Techniques LLC **Booth: 224**
106 Union Valley Rd
Oak Ridge, TN 37830
865-482-9937; FAX: 865-483-0473

Gross Counting with Geiger-Mueller and Nal(Tl) detector systems. Spectroscopy with Multi-channel Analyzers for Nal(Tl) detector systems. Exempt Quantity Sealed Radioactive Sources. Nominal and calibrated Gamma. Nominal Alpha and Beta. Isotope Generator.

Technical Associates/ Overhoff Technology Corp. **Booth: 602**
7051 Eton Avenue
Canoga Park, CA 91303
818-883-7043; FAX: 818-883-6103

Recent additions to TA's Health Physics instrument line include air and area monitors, which are smarter, more sensitive and more rugged than previously available, in addition to pipe and plume and the latest advances in portables.

Teledyne Brown Engineering, Inc. **Booth: 611**
2508 Quality Lane
Knoxville, TN 37931
865-934-0373; FAX: 865-690-6187

TBE Knoxville Laboratory offers a broad spectrum of radioanalytical services for bioassay, environmental samples, and waste characterization. Our generous radioactive material license allows receipt of samples in the millicurie range. TBE provides customized support to environmental consultants, government agencies, waste processors, and a host of nuclear power customers.

Teletrix Corporation **Booth: 526**
PO Box 14209
Pittsburgh, PA 15239
412-798-3636; FAX: 412-798-3633

Teletrix manufactures Radiation Training Simulators for the nuclear power industry, first responders, the military, state and local governments, hospitals and universities. Radiation training with simulators presents realistic training scenarios in complete safety without the use of any live sources, strictly adhering to the spirit of ALARA. Made in the USA since 1988, they are used in programs to advance hands-on training in radiation-related work environments.

Thermo Fisher Scientific **Booth: 410**
1410 Gillingham Lane
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P.59 Regulatory Research in Radiation Protection, U.S. Nuclear Regulatory Commission

Bush-Goddard, S.
US Nuclear Regulatory Commission

The field of radiation protection has made significant advances in the last few decades, and these advances have various regulatory implications for potential occupational and public exposures. This poster presentation will illustrate regulatory-research-related topics concerning the impacts of adapting the International Commission on Radiological Protection recommendations in Publication 103 to 10 CFR Part 20 regulations, a status of the Commission's initiatives on analyzing cancer incidence and current health risk. In addition, the poster presentation will demonstrate current research in radiation dosimetry, methods of beta and gamma dose computations, and dose assessment projects including national and international efforts in analyzing occupational exposure data and as low as reasonably achievable (ALARA) techniques.

P.60 Estimation of Entrance Surface Doses (ESDs) for Common Medical X-Ray Diagnostic Examinations in Radiological Departments in Mashhad-IRAN

Esmali, S. Taghi, M., Toossi, B.
Mashad University of Medical Sciences, Iran

Background: The British national radiological protection board (NRPB) introduced the use of diagnostic reference levels (DRLs) as an efficient standard for optimizing the radiation protection of patients. The physical parameter recommended for monitoring the (DRLs) in conventional radiography is the entrance skin dose (ESD) and methods for measuring it is clearly described in NRPB standard protocol.

Method: The data were collected for 1183 radiographs of adult patients. The sample of patients was chosen so that the weight of patients was between 50-80 kg. Eight conventional X-ray examinations were chosen for this study. Entrance surface dose (ESD) of individual patient was directly measured by thermoluminiscence dosimeter, TLD chips sealed in a plastic sachet were stuck on the skin of patient at the center of X-ray beam axis.

Results: In this study, 3rd quartiles of measured ESDs for patients undertaking a particular examination were selected as ESD for study sample, based on this assumption ESDs for X-ray examination included in this study are as follows: Chest PA- 0.37 mGy, Chest Lat- 1.8 mGy, Lumbar Spine AP- 3.6 mGy, Lumbar Spine Lat- 5.6 mGy, Pelvis AP- 3.5 mGy, Abdomen AP- 3.7 mGy, Skull PA- 2.96 and Skull Lat- 1.79 mGy.

Conclusion: The data were analysed statistically, and the minimum, median, mean, maximum, first and third quartile values of ESDs are reported. Finally, our results were compared with the proposed Iranian DRLs, the international reference

dose values reported by the European Commission, the International Atomic Energy Agency and the National Radiological Protection Board. It is evident that ESDs obtained in this work for Abdomen AP, Pelvis AP, Lumbar AP and Lumbar Lat examination do not exceed DRLs values worked out by NPRB. On the contrary for Chest PA, Chest Lat, Skull PA and Skull Lat, higher ESDs were acquired in this study compared with DRLs suggested by NRPB. There is no single reason for dose variations, but the reasons are complex, in general, low filtration, high mAs and low tube potential are associated with higher doses arising from application of various X-ray machines.

P.61 MCNP Simulating OSL Ring Response Matrix for X-Ray Spectrums

Xia, Z., Salasky, M.
Landauer, Inc.

MCNP (Monte Carlo N-particle transport code) ver. 5 was used to simulate the photon response of a single element Al2O3:C extremity ring dosimeter. A Sn filter of 0.35 mm thickness was determined to be the optimum thickness to flatten the Al2O3:C photon response relative to 662 keV photon of Cs-137 to within +/- 35% for photon between 53 keV and 662 keV, which covers the nuclear medicine application energy range.

Large doses were delivered to fingers in nuclear medicine application area, which makes minimal angle response a necessity because fingers twist a lot in the radiation field. The Al2O3:C element to filter distance was identified as an important characteristic concerning the angular response of the dosimeter. An element to filter distance of 3.5 mm was simulated to be the optimum distance to obtain a consistent angular response for angles between +/- 80°. Benchmark irradiations of proto-type dosimeters were consistent with the simulated design demonstrating agreement with the simulation to within +/- 13%.

P.62 Design and Simulation of a Passive-Scattering Nozzle in Proton Beam Radiotherapy

Guan, F., Poston, J., Braby, L.
Texas A&M University

The objective of this research is to obtain the three-dimensional conformal dose distribution in proton beam radiotherapy. The methods are firstly to design a double-scattering system in a passive-scattering treatment nozzle and then to simulate the transport of protons. The double-scattering system is designed using the NEU (Nozzle with Everything Upstream) codes package, and the transport of protons in the newly-designed treatment nozzle and a water phantom is simulated using the Monte Carlo code MCNPX (Monte Carlo N-Particle eXtened). The dynamic range modulation wheel in the nozzle cannot be modeled in the simulation of MCNPX. This problem is solved by implementing a Perl (a programming language) script, which is used to convert the dynamic simulation problem into a series of successive static simulation problems. The other Perl script is used to collect the separate static simula-

tion results and merge them into one result as if it was directly produced from the dynamic simulation. The three-dimensional dose (including depth-dose and transverse-dose) distributions in a water phantom for different nozzle settings are obtained in this research.

P.63 Radiographic Imaging of a Low-Z Sample Using Laser Compton Scattered X-Rays

Naeem, S., Chouffani, K., Wells, D.
Idaho State University, Pocatello

Laser Compton Scattered (LCS) x-rays are produced as a result of the interaction between accelerated electrons and a laser beam. The yield and energy of LCS x-rays is dependent on angle of collision between interacting particles, emittance of electron and laser beams, the electron linear accelerator's (linac) electron beam energy and current, and the laser's wavelength and its power. One of our on-going research objectives at the Idaho Accelerator Center (IAC) is to improve spectral signal-to-noise ratios for radiographic imaging. Since LCS x-rays are both tunable and quasi-monochromatic, they offer much better signal-to-noise ratios in imaging applications with minimal scattering (lower background radiation). This improves contrast in the resulting radiographic image. Further, the absence of "white noise" in LCS x-ray spectrum (LCS x-rays are polarized and non-isotropic) is not only suitable in low dose deposition for possible medical applications but also eliminates the need to use filters traditionally being used to suppress unwanted portions of the classical x-ray tube's x-ray spectrum. Radiographic image of a low-Z sample (fish) was taken using ~20 keV LCS x-rays. We collected approximately 3,800 net LCS photons per centimeters squared per second, that implies further intensity improvements are necessary in the future. The quasi-monochromatic LCS photopeak was produced based on electron beams tuned to approximately 33 MeV. The beam was brought to a collision with the 4 GW peak-powered Nd:YAG laser operating at 1064 nm wavelength. The linac was operating at 60 Hz with an electron beam pulse length of about 50 ps and a peak current of about 7 A.

P.64 Application of Probabilistic RESRAD-BIOTA Code in the IAEA EMRAS II Biota Working Group's Beaverlodge Scenario

Kamboj, S., Yu, C., LePoire, D., Klett, T., Cheng, J.-J., Normandy, J., Williams, W.A., Domotor, S., Wallo, A.
Argonne National Laboratory, US Department of Energy

The RESRAD-BIOTA code has been updated to include the capability to conduct probabilistic/uncertainty analyses, which uses input parameter probability distributions compiled from literature data. Distribution functions have been developed and used in RESRAD-BIOTA for many parameters, including fresh water/sediment distribution coefficient (Kd), fraction of intake retained, fresh water species-specific bioaccumulation factors (Biv), relative biological effect (RBE), and many allo-

metric parameters used to estimate biota ingestion and inhalation rates. The probabilistic version of RESRAD-BIOTA code was applied to analyze the Beaverlodge scenario, as part of the modeling comparison exercise conducted by the International Atomic Energy Agency's (IAEA's) Second Environmental Modeling for Radiation Safety Program's (EMRAS II's) Biota Working Group. In this scenario, several lakes in the Beaverlodge and Athabasca Region of Canada were assumed to be contaminated due to past uranium mining operations, resulting in impacts to the lakes' invertebrate communities. The purpose of this model comparison exercise was to assess the potential impacts and compare modeling methods and parameters used by different modelers from several countries. For this exercise, water and sediment samples from four study areas at 16 sites collected from 2001 to 2006 were analyzed for Pb-210, Po-210, Ra-226, Th-230, and U-238. The whole-body concentration was predicted for White Sucker, Lake White Fish, Fingernail Clam, and Chironomus using the probabilistic fresh water (radionuclide and biota-specific) Biv values. If the water concentration for a site was not available, the sediment concentration along with the Kd value was used to predict the whole-body concentration in the biota. In the second part of the exercise, the predicted whole-body concentrations from different models would be compared to the measured concentrations.

P.65 PIMAL: A GUI for Enabling Radiation Dose Assessment Using Phantoms with Realistic Postures

Akkurt, H., Wiarda, D., Eckerman, K.
Oak Ridge National Laboratory

Previously, a computational phantom with moving arms and legs and an accompanying graphical user interface (GUI), PIMAL, was developed to enable the dose estimation using realistic postures in a user-friendly manner. The dose estimation for realistic posture is especially important for occupational exposure, in which the worker is being exposed to radiation in different postures (i.e., glove-box worker or physician performing operation on a patient). The use of standard vertical-upright phantom models for the analysis of these cases would normally yield inaccurate dose estimations. Therefore, PIMAL was developed to serve as a flexible software tool to ease the burden of setting up and executing radiation transport simulations using different postures, using MCNP, for dose estimations. However, the first version of the PIMAL was somewhat limited in its features, i.e., it contained only a hermaphrodite phantom model and allowed only isotropic source definitions. Currently, the features of PIMAL are being further enhanced by incorporating additional phantom models, improving source features, and improving user-friendliness in general. In this new version, in addition to the original hermaphrodite phantom model, male and female phantom models are added. The user can still change the posture

using slider bars in addition to the added text boxes. Furthermore, the source features have been enhanced significantly. The source specification now includes internal and external source options in a pull-down menu. For internal organs, the source is assumed to be uniformly distributed within the organ. For external sources, in addition to a point source, the user can select from the standard ICRP external source geometries (AP, PA, LLAT, RLAT, ISO) using the pull-down menu. Once the phantom model is selected, the posture is defined, and the simulation parameters are set, the user can generate the input and perform the MCNP computations using the GUI. After the radiation transport simulation is complete, the estimated organ dose values are displayed in a tabulated form. In this paper, the main features of the PIMAL software are described. *This work was funded by the Nuclear Regulatory Commission.

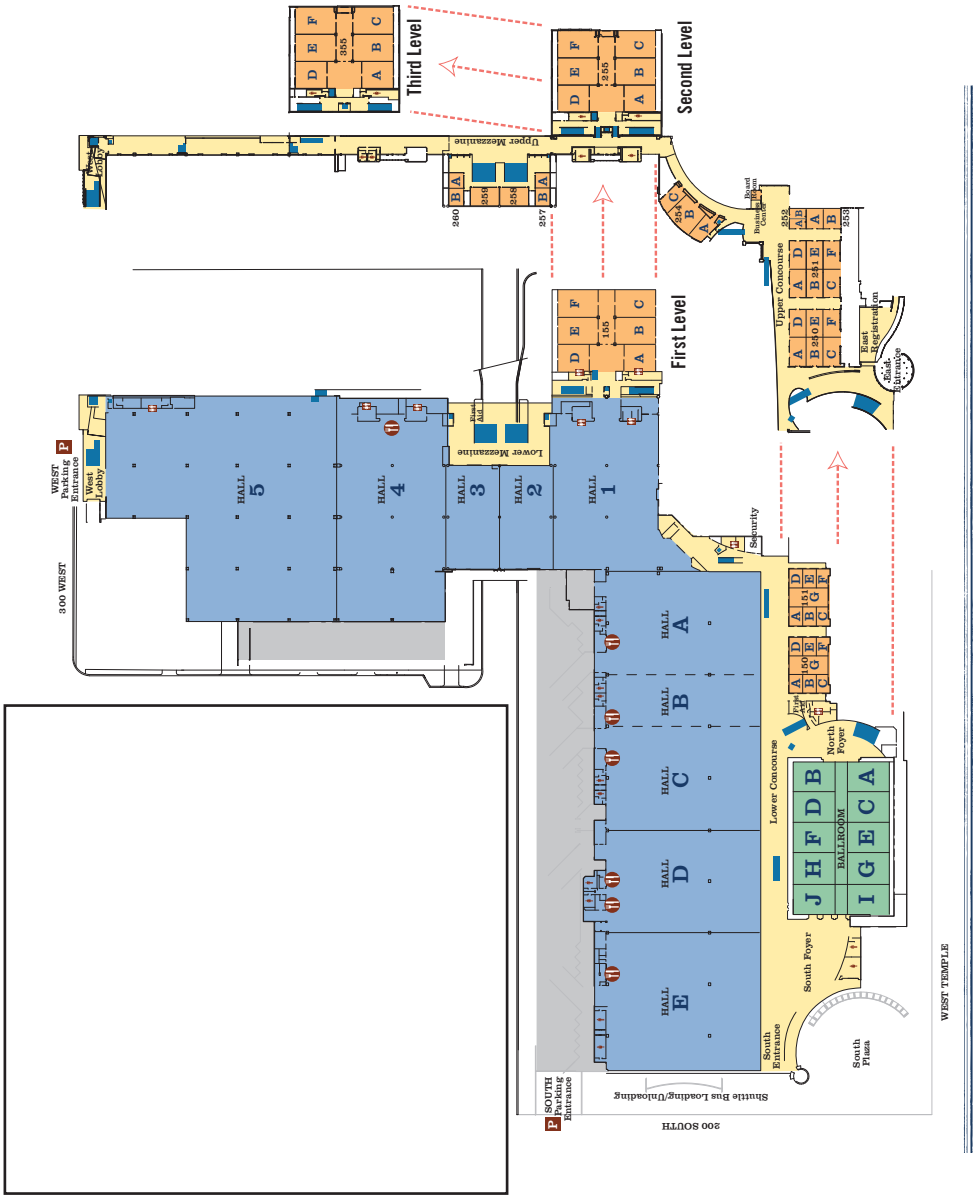
P.66 Evaluation of Uranium Chemical and Radio-Toxicity in the Workplace for Bioassays

Meck, R., Leggett, R.W., Eckerman, K.F., McGinn, C.W.
Science and Technology Systems, LLC, Oak Ridge National Laboratory

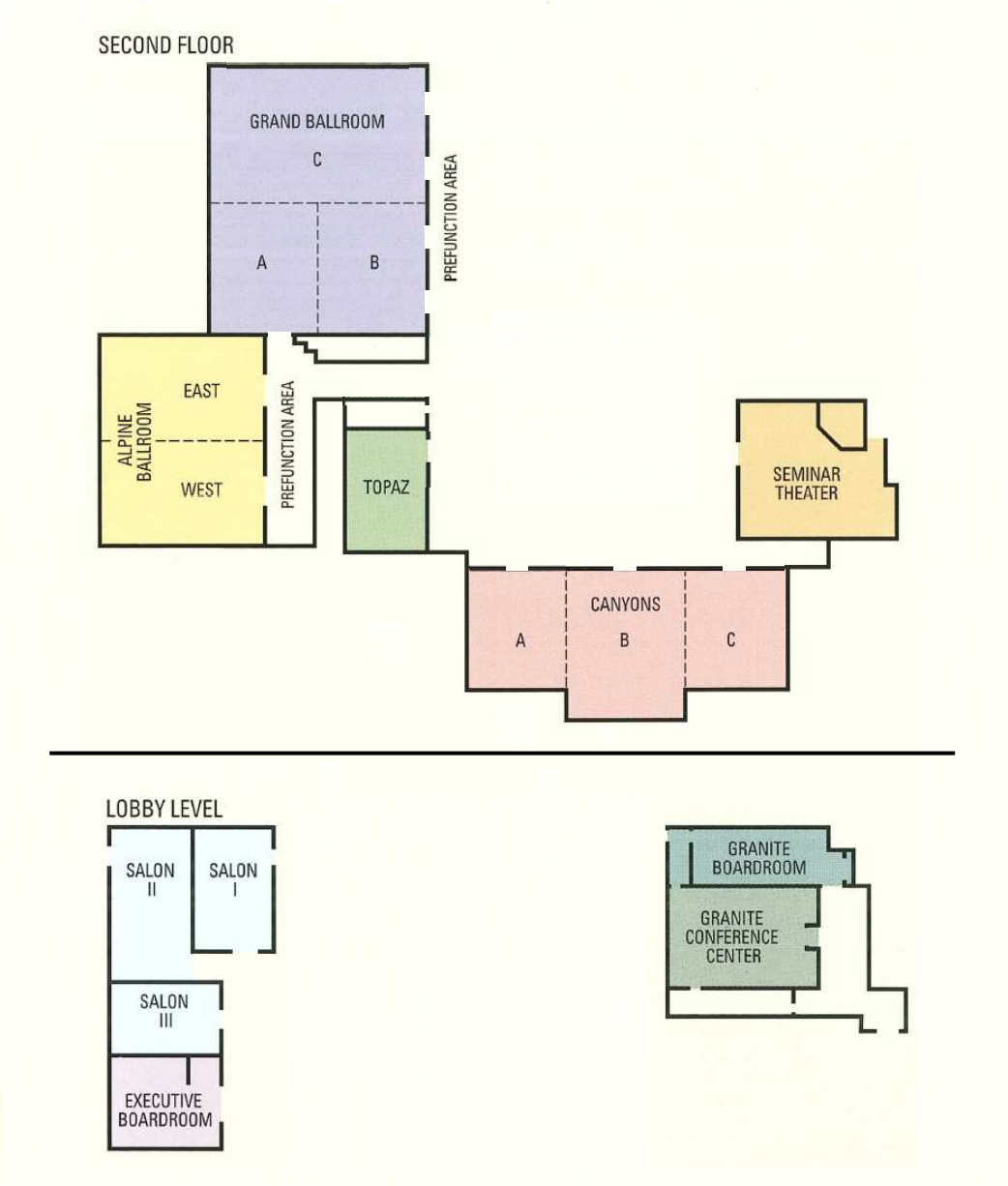
The authors are reevaluating the chemical and radio-toxicity of uranium. We are including the most recent published case reports and biokinetic models to update approaches for uranium bioassays. In vivo measurements of uranium intakes are direct measurements,however low counting efficiencies and relatively high uncertainties are associated with them. In vitro bioassays of urine or feces are indirect measurements of the sensitive tissues' exposure to uranium as a chemical and as a radiation source as inferred through biokinetic models. We are using contemporary biokinetic models from the International Commission on Radiation Protection. These models link the timing and concentration of tissue exposures to the concentrations excreted in the urine and feces. Based on published observations of tissue effects from concentrations of uranium and radiological doses in humans and animals, we estimate protective occupational limits of uranium intakes that can be technically defended with current scientific information and methods. We explicitly calculate the biokinetics of uranium intakes with various characteristics in the human respiratory system, the alimentary tract, and in the blood. The characteristics include: solubility, chemical form, aerodynamic mean activity diameter (AMAD), acute and chronic intakes, enrichment, and default values if the form of uranium is unknown. We calculate the biokinetics of both acute and chronic exposures and the superimposed combination of acute and chronic exposures. We have produced very informative graphs of investigation levels and immediate action levels that show the cross-over of chemical toxicity to radiotoxicity as functions of air concentrations of uranium, solubility, and percent enrichment. We also predict the optimum times for collecting bioassay specimens or measurements.

Author Index

Salt Palace Convention Center Floorplan



Hilton Floorplans



Saturday, 26 June

AAHP 1 Training Emergency Responders; Materials, Tools, and Methods for Health Physicists
8:00 AM-5:00 PM Canyon B, Hilton

AAHP 2 8-hour HAZWOPER Refresher Course
8:00 AM-5:00 PM Canyon A, Hilton

Sunday, 27 June

PEP 1-A thru 1-H
10:30 AM-12:30 PM

PEP 2-A thru 2-H
2:00-4:00 PM

PEP Rooms:
1A/2A - 250A
1B/2B - 250B
1C/2C - 250C
1D/2D - 251B
1E/2E - 251C
1F/2F - 251D
1G/2G - 251E
1H/2H - 251F

Welcome Reception
6:00-7:00 PM
Hilton Grand Ballroom

Saturday AAHP courses will take place in the Hilton Salt Lake.

Sunday - Thursday All Sessions, CELs and PEPs take place in the Salt Palace Convention Center

Monday, 28 June

CEL1 ABHP Exam Fundamentals Tips for Successfully Completing the Certification Process
7:00-8:00 AM 251D

CEL2 Update on Medical Internal Radiation Dosimetry: MIRD Committee Recommendations ...
7:00-8:00 AM 251E

ABHP Exam - Part I
8:00-11:00 AM Alpine East/West (H)

MAM-A Plenary: The Future of the Nuclear Industry
8:30 AM-Noon Ballroom E/F/G/H

Complimentary Lunch in Exhibit Hall for all Registrants and Opening of Exhibits
Noon-1:00 PM Exhibit Hall A

PEP Program
12:15-2:15 PM

PEP M1 Counseling Workers Part I, Understanding Basis for Upset & Fears 251B

PEP M2 EH&S "Boot Camp" for Radiation Safety Professionals: A Unique 3 Part PEP (Part 3) 251C

PEP M3 Optical Radiation: An Overview of Biological Effects and Exposure Limits 251D

PEP M4 Part II Accelerator Health Physics ABHP Exam Problems252A/B

PEP M5 Introduction to Monte Carlo Methods for the HP (Part 1) 251F

PEP M6 HPS/ANSI N13.53, Control and Release of Technologically Enhanced Naturally Occurring Radioactive Material 251E

ABHP Exam - Part II
12:30-6:30 PM Alpine East/West (H)

HPS Chapter Council
1:00-2:00 PM Ballroom A

Poster Session
1:00-3:00 PM Exhibit Hall A

MPM-A Instrumentation
3:00-5:00 PM Ballroom A

MPM-B1 Waste Management
3:00-4:15 PM Ballroom B

MPM-B2 Biokinetics and Bioeffects
4:30-5:15 PM Ballroom B

MPM-C Power Reactor Section Special Session - Nuclear Power HP 2010
3:00-5:30 PM Ballroom C

MPM-D Contemporary Topics in HP
3:15-4:15 PM Ballroom D

MPM-E Board of Laser Safety Special Session
3:00-4:45 PM 150 ABC

MPM-F GTRI/NNSA Special Session
3:00-4:00 PM 150G

Student Reception
5:30-6:30 PM 250AB (CC)

Tuesday, 29 June

CEL 3 ANSI N43.1 Standard Draft: Rad Safety for Design & Operation...
7:00-8:00 AM 251D

CEL4 Overdose of Patients Receiving CT Scans
7:00-8:00 AM 251E

TAM-A External Dosimetry I
8:30 - 11:30 AM Ballroom A

TAM-B Environmental I
8:15 AM-Noon Ballroom B

TAM-C AAHP Special Session I Rad Dose Reconstruction for Epidemiology
8:30 AM-Noon Ballroom C

TAM-D Decommissioning
8:30-11:30 AM Ballroom D

TAM-E Reactor Health Physics
8:15-9:45 AM 150 ABC

TAM-F Accelerator Section Special Session I - Light Sources and FELs
8:30-11:45 AM 150G

Power Reactor Business Meeting
9:45 AM 150 ABC

Accelerator Section Business Mtg
11:45 AM 150G

AAHP Awards Luncheon
Noon-2:15 PM 151G

PEP Program
12:15-2:15 PM

PEP T1 Laser Safety for Health Physicists 251B

PEP T2 Advances in Characterizing Rad Output of CT Scanners 251C

PEP T3 Managing Low-Level Radioactive Waste at an Academic Institution Without Breaking the Bank 251D

PEP T4 Training First Responders on (RDDs) and (INDs) Events 251E

PEP T5 Intro to Monte Carlo Methods for the HP (Part 2) 251F

TPM-A External Dosimetry II
2:45-5:15 PM Ballroom A

TPM-B1 Environmental II
2:15-3:00 PM Ballroom B

TPM-B2 NESHAPs Radio Air Mtg
3:30-5:30 PM Ballroom B

TPM-C AAHP Special Session II Rad Dose Reconstruction Epidemiology
2:30-5:15 PM Ballroom C

TPM-D Decommissioning Section Special Session
2:30 - 5:30 PM Ballroom D

TPM-E Homeland Security
2:30-5:15 PM 150 ABC

TPM-F Accelerator Section Special Session II - Light Sources and FELs
2:30 - 5:00 PM 150G

AAHP Open Meeting
5:15 PM Ballroom C

Decommissioning Section Bus Mtg
5:30 PM Ballroom D

HPS Awards Banquet
7:00-10:00 PM Hilton Grand Ballroom

Wednesday, 30 June

CEL5 Rad Releases & Environ Monitoring at Commercial Nuclear Power Reactors
7:00-8:00 AM 251D

CEL6 Dose Reconstruction for Radiation Epidemiology
7:00-8:00 AM 251E

WAM-A Medical Health Physics I
8:45-11:00 AM Ballroom A

WAM-B Environmental/Radon Section Special Session - Radioecology
8:30-11:45 AM Ballroom B

WAM-C Internal Dos & Bioassay
8:15-11:15 AM Ballroom C

WAM-D Special Session: Radiological Incident Consequence Mgmt I
8:30 AM - Noon Ballroom D

WAM-E NCRP Special Session Overview of Current Report and Conference Activities of National Council ...
8:30 AM-Noon 150 ABC

WAM-F Operational Health Physics
8:30-11:30 AM 150G

Medical Section Business Meeting
11:00 AM Ballroom A

Environ/Radon Section Bus Mtg
11:45 AM Ballroom B

PEP Program
12:15-2:15 PM

PEP W1 Counseling Workers Part II, Tools for Effective Risk Comm 251B

PEP W2 So Now You're the RSO: Elements of Effective Rad Safety 251C

PEP W3 Testifying as a Health Physics Expert Witness 251D

PEP W4 How the Legislature Really Works 251E

PEP W5 Intro to Monte Carlo Methods for the HP (Part 3) 251F

WPM-A Medical Health Physics II
2:30 - 5:00 PM Ballroom A

WPM-B Accelerator
2:30 - 3:45 PM Ballroom B

WPM-C CRSO Session DOT Train-the-Trainer
2:30 - 5:15 PM Ballroom C

WPM-D Special Session: Rad Incident Consequence Management II
2:30 - 5:00 PM Ballroom D

WPM-E NRC Special Session on Safety Culture
2:30 - 5:00 PM 150ABC

WPM-F Military Sect Special Session
2:30 - 4:45 PM 150G

Movies
2:30 - 5:00 PM 251D

HPS Business Meeting
5:15 PM Ballroom B

WPM-G ADJUNCT TECHNICAL SESSION: Aerosol Measurements
6:00 - 8:00 PM Canyon A (Hilton)

Thursday, 1 July

THAM-A Medical Health Physics Section Special Session
8:15 - 10:45 AM Ballroom A

THAM-B NCI Special Session - NCI Dosimetry Studies
8:30-10:30 AM Ballroom B

THAM-C CRSO Session Regulatory Trends
8:30 AM - Noon Ballroom C

THAM-D Emergency Planning
8:15 - 10:00 AM Ballroom D

THAM-E Regulatory/Legal
8:15 - 9:45 AM 150 ABC

THAM-F Nanotechnology Special Session
8:30 - 10:00 AM 150G

CRSO Business Meeting
10:30 AM Ballroom C

PEP Program
10:45 AM-12:45 PM

PEPTH1 Health Physics Concerns of Neutron Exposures, Criticality Safety and Criticality Accidents 251B

PEPTH2 Refresher for HPs Physiological Impacts of Respiratory Protection 251C

PEPTH3 Advanced Techniques and New Technologies Used in Emergency Response Exercises 251D

PEPTH4 A Fluoroscopy Credentialing Program for Physicians 251E

PEPTH5 Fundamentals of Gamma Spectroscopy, Part 2 (Part 1 not included in PEP 2010) 251F

Registration Hours

Registration at the Salt Palace Convention Center
Ballroom AB Foyer

Saturday	2:00 - 5:00 PM
Sunday	10:00 AM - 5:00 PM
Monday	8:00 AM - 4:00 PM
Tuesday	8:00 AM - 4:00 PM
Wednesday	8:00 AM - 4:00 PM
Thursday	8:00 - 11:00 AM

Exhibit Hall Hours

Exhibit Hall A

Monday	Noon - 5:00 PM
Tuesday	9:30 AM - 5:30 PM
Wednesday	9:30 AM - Noon

KEY

MAM Monday AM Session
MPM Monday PM Session
TAM Tuesday AM Session
TPM Tuesday PM Session
WAM Wednesday AM Session
WPM Wednesday PM Session
THAM Thursday AM Session

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 PEP courses are granted 4 CECs each;
* HPS 1 hour CELs are granted 2 CECs each.