Final Program

American Radiation Safety Conference and Exposition

(Health Physics Society's 46th Annual Meeting)

June 10-14, 2001
Cleveland Convention Center
Cleveland, Ohio

Headquarters Hotel:
Cleveland Marriott: (216) 696-9200
Guest FAX: (216) 696-8615

Overflow Hotels:
Sheraton Cleveland: (216) 771-7600
Holiday Inn: (216) 241-5100

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Registration Hours

Registration will take place at the Cleveland Convention Center

Sunday, June 10 ..... 7:00 am - 7:00 pm
Monday, June 11 ..... 8:00 am - 4:00 pm
Tuesday, June 12 ..... 8:00 am - Noon; 2:30 - 4:00 pm
Wednesday, June 13 ..... 8:00 am - 4:00 pm
Thursday, June 14 ..... 8:00 am - Noon

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ARSCE 2001 Corporate Sponsors:

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Future Annual Meetings

47th	6/16-20, 2002	Tampa, FL
48th	7/20-24, 2003	San Diego, CA

Future Midyear Topical Meeting

35th	2/17-20, 2002	Orlando, FL

Registration Fees

Class	Pre-Reg	On-Site
♦HPS Member	$265	$340
♦Non-Member**	$330	$405
♋Student	$ 55	$ 55
♎Companion	$ 45	$ 45
Exhibition **ONLY**	$ 25	$ 25
Exhibitor (2/booth)	No Fee	No Fee
●Member, 1 Day	n/a	$195
●Non-Member, 1 Day	n/a	$195
●Student, 1 Day	n/a	$30
Additional Tues. Awards Lunch Ticket(s)	$ 30	$ 30

- ♦ Includes Sunday Reception, Monday Lunch and Tuesday Luncheon Awards Banquet
- ♋ Includes Sunday and Student Receptions, Monday Lunch and Tuesday Luncheon Awards Banquet
- ♎ Includes Sunday Reception, Monday Hospitality Mixer Breakfast, Monday Lunch
- ● Includes Sessions and Exhibitions **ONLY**

**Includes Associate Membership for year 2001.

Registration Hours

Sunday, June 10 ..... 7:00 am - 7:00 pm

Monday, June 11 ..... 8:00 am - 4:00 pm

Tuesday, June 12 ..... 8:00 am - Noon;
2:30 - 4:00 pm

Wednesday, June 13 .. 8:00 am - 4:00 pm

Thursday, June 14 ..... 8:00 am - Noon

Information

Speaker Instructions

You will be allotted a total of 12 minutes unless you have been notified otherwise.

The **Ready Room** (Convention Center Room 209) will be open Sunday from 3-4:30 pm, Monday from 7-11 am and 1-4pm, Tuesday from 7-11 am and 1:30-4 pm, Wednesday from 8-11 am and 1:30-4 pm and Thursday from 7:30-11 am. Slides are to be brought to the Ready Room for loading and previewing no later than the time indicated below:

Present. Time	Delivery Deadline
Monday am	3-4:30 pm Sunday
Monday pm	7–11am Monday
Tuesday am	1–4 pm Monday
Tuesday pm	7–11 am Tues.
Wednesday am	1:30–4 pm Tues.
Wednesday pm	8–11 am Wed.
Thursday am	1:30-4 pm Wed.

Please meet with your session chairs in the meeting room where your paper will be presented 15 minutes before the beginning of the Session.

Placement Service

Placement Service listings will be posted in Convention Center Room 211, with hours from 8:00 am-5:00 pm, Monday through Wednesday and Thursday from 8:00 am - Noon. Interviews may be conducted in the designated areas of the Placement Center.

Business Meeting

The **HPS Annual Business Meeting** will be convened at 5:30 pm on Wednesday, June 13, in Room 230A (Convention Center).

Luncheon Awards Banquet

The **Awards Banquet** will be held in the Convention Center Public Auditorium on Tuesday, June 12 at Noon. The following awards are to be presented:

Robley D. Evans Commemorative Medal
Allen Brodsky

Distinguished Scientific Achievement Award
John H. Hubbell

Elda E. Anderson Award
T. Edmond Hui

Founders Award
J. Newell Stannard
Paul L. Ziemer

Fellow Award
Theresa L. Aldridge
Thomas R. Crites
Norman C. Dyer
Benjamin S. Friesen
Carl V. Gogolak
Richard E. Jaquish
Warren E. Keene
Jack S. Krohmer
Arthur C. Lucas
Dennis M. Quinn
Lester R. Rogers
Geoffrey Stapleton
Joseph R. Stencel
Daniel J. Strom
Wesley R. Van Pelt

Science Teacher Award
Michael Mocherman

The following menu has been selected for the **Awards Banquet**:

Greek salad with Greek dressing
Stuffed Breast of Chicken Supreme with Mushroom-Orzo Stuffing
Whole Green Beans with Slivers of Red Peppers
Rolls, Sweet roll and butter
Strawberry Mousse in a Chocolate Cup

Companion Hospitality Room

A **Hospitality Room** (Marriott, Huron Room) will be available to meet old friends and to learn about the attractions in the Cleveland area. Local citizens with literature about the city and environs will be on hand to help attendees plan do-on-your-own activities. Refreshments will be available for registered companions from Monday morning through Wednesday morning.

On Monday morning from 8:00 to 9:00 am, prior to the departure of the City Tour, we invite all registered companions to an official welcome and a complimentary continental breakfast in the Marriott Grand Ballroom B/C. The same breakfast is available on a cash basis for non-registered companions. A representative of North Coast Tours will introduce you to Cleveland and answer any questions you may have.

Hours/Days

8 AM-Noon

Monday, Tuesday, Wednesday

Activities and Tours

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

Sunday, June 10

Cedar Point Amusement Park	Cancelled
City Tour	Cancelled

Monday, June 11

Six Flags Amusement Park	Cancelled
City Tour	9:30 am-12:30 pm
Cleveland Clinic & CWRU Hospital	1-4 pm
Pub Crawl	6-10 pm

Tuesday, June 12

5K Run/Walk	6:30-8:30 am
Inovision/St Gobain	9 am-1:30 pm
Univ Circle Museum Tour	Cancelled
Amish Tour	Cancelled
Night Out	6-10 pm

Wednesday, June 13

Perry Nuclear Plant	9 am-4 pm
Cuyahoga Valley Railroad	Cancelled
Univ Circle Museum Tour	Cancelled
Ballgame **SOLD OUT**	7 pm-??

Thursday, June 14

Rainforest Zoo Tour	Cancelled

Child Care

You can make arrangements for childcare as necessary. The rates per hour depend upon the situation. The hotel recommends:

Rent-A-Mom

National Toll Free
Telephone Number
1-888-282-6667
Cleveland Telephone Number
1-216-901-9599

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.

Important Events!

Welcome Reception

The Welcome Reception will be held Sunday, June 10 from 6–7:30 pm at the Cleveland Marriott Grand Ballroom E-H and Foyer.

Sessions

Saturday – AAHP Courses will be held in the Cleveland Marriott.

Sunday - Thursday – All PEP Sessions will be held in the Cleveland Convention Center.

Monday – Plenary Session will be held in the Cleveland Convention Center, Music Hall.

Monday –Thursday – All Technical Sessions will be held in the Cleveland Convention Center.

Exhibits

Free Lunch! Free Lunch! – Noon, Monday, June 11. All registered attendees are invited to attend a complimentary lunch in the exhibit hall immediately following the Plenary Session.

Breaks Monday Afternoon-Wednesday Afternoon – Featuring morning Continental Breakfasts and afternoon refreshments such as ice cream and cookies. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!

Things to Remember!

All posters up Monday–Wednesday in Exhibit Hall

Poster Session featured Monday, 1:30-3:00 pm – No other sessions at that time

No computer projection available for technical sessions

AAHP Awards Luncheon

The AAHP is sponsoring an Awards Luncheon on Wednesday, June 13, from Noon-2:30 pm in the Cleveland Marriott, Grand Ballroom E-H.

The following rate structure will apply:

1) Persons certified in 2000 ..... Free

2) CHPs other than #1 ..... $10.00

3) Guests and others wishing to attend $15.00

To sign up for the Luncheon, stop by the HPS Registration Desk.

RADIATION SAFETY CONFERENCE
NIGHT OUT ON
THE GOODTIME III PLEASURE CRUISE!
Tuesday Night, June 12, 6:00 – 10:00 PM

Bus departure begins at 6:00 PM for a 7:00 PM boat departure

The Northern Ohio Chapter of the Health Physics Society (NOCHPS) in conjunction with the National Health Physics Society (HPS), and the American Radiation Safety Conference and Exposition is proud to host an exciting social event aboard the ship, The Goodtime III, for a pleasure cruise. They have chartered this ship for an exciting and pleasant evening of eating, dancing and sight seeing.

Start the evening with a sumptuous buffet featuring Captain Jim's favorite dinner: Hand Carved Steamship Round of Beef, Breast of Chicken w/apricot Sauce, Potatoes AuGratin, Rotini Pasta/wMarinara Sauce, Green Beans Almondine, Dinner Rolls/Butter, Beverage and a delicious Dessert.

Savor a drink while you stroll the decks and enjoy the commentary of the sights you are viewing along the shoreline. Stop, sit and spend time talking to the friends and colleagues you meet on the deck. Watch the spectacular sunset over Western Lake Erie as the large orange ball falls below the horizon, lighting the sky with a beautiful array of colors.

On the main deck, dance to the music of Captain Jim's orchestra. Forward on the second deck is an ideal place to enjoy the lights on shore as the ship cruises the lake and travels up the Cuyahoga River. The third deck is yet another place to view this spectacular scenery.

For the romantically inclined, it is indeed smooth sailing, cruising the sparkling Lakefront of Cleveland under the stars, with the moonlight shimmering off the smooth lake waters. Your evening will be filled with fine food, excellent entertainment and spectacular views of this "renaissance" city. Come join your colleagues and enjoy an evening on Lake Erie. Mix and mingle with friends from the past and make the acquaintance of others in a relaxing, casual-yet–elegant atmosphere.

We thank K&S Associates, Ludlum Measurements, Inc., and Saint-Gobain Crystals and Detectors for their support.

HPS Committee Meetings

Cleveland Marriott = (CM); Cleveland Sheraton = (CS)
Cleveland Convention Center = (CC)

Friday, June 8, 2001

ABHP BOARD MEETING
9 am-5 pm — *Erie (CM)*

Saturday, June 9, 2001

FINANCE COMMITTEE
8 am-Noon — *Ontario (CM)*

NRRPT
8:30 am-4:30 pm — *Hope (CS)*

ABHP BOARD MEETING
9 am-Noon — *Erie (CM)*

CONTINUING EDUCATION COMMITTEE
Noon-6 pm — *Superior (CM)*

AAHP EXECUTIVE COMMITTEE
1-5 pm — *Erie (CM)*

HPS EXECUTIVE COMMITTEE
1-5 pm — *Presidental Suite (CM)*

HPJ EDITORIAL BOARD
3-6 pm — *Ballroom E (CM)*

Sunday, June 10, 2001

HPS BOARD OF DIRECTORS
8 am-5 pm — *Erie/Superior (CM)*

NRRPT
8:30 am-4:30pm — *Hope (CS)*

VENUES COMMITTEE
8:30 am-4 pm — *Huron (CM)*

AAHP EXECUTIVE COMMITTEE
9 am-Noon — *Ballroom A (CM)*

ANSI N13.30
9 am-Noon — *Ontario (CM)*
4-9 pm

PROGRAM DIRECTORS MEETING
5-6:30 pm — *Ballroom D (CM)*

PROGRAM COMMITTEE MEETING
1:30 - 4:30 pm — *209 (CC)*

Monday, June 11, 2001

AEC WORKING GROUP
6:30-8:30 am — *Ontario (CM)*

NRRPT
8:30 am-4:30 pm — *Hope (CS)*

HISTORY COMMITTEE
11:30 am-1:30 pm — *Room 206 (CC)*

PUBLICATIONS COMMITTEE
Noon-2 pm — *Room 208 (CC)*

SUMMER SCHOOL COMMITTEE
Noon-2 pm — *Conf Suite 420 (CM)*

STRATEGIC PLANNING COMMITTEE
Noon-3 pm — *Room 224 (CC)*

NOMINATIONS COMMITTEE
Noon-3 pm — *Room 225 (CC)*

AD HOC COMMITTEE - CREDENTIALING
12:30-2 pm — *Erie (CM)*

RSO SECTION EXECUTIVE BOARD
12:30-2:30 pm — *210 (CC)*

MEMBERSHIP COMMITTEE
1-2 pm — *Room 223C (CC)*

N13.32
1-3 pm — *Room 223A (CC)*

AAHP/PROFESSIONAL DEVELOPMENT COMMITTEE
1:30-3 pm — *Ontario (CM)*

INTERNATIONAL RELATIONS COMMITTEE
1:30-3 pm — *Room 204 (CC)*

LIAISON COMMITTEE
2-3:30 pm — *Superior (CM)*

SPI COMMITTEE
2-4 pm — *Erie (CM)*

SYMPOSIA COMMITTEE
2-4 pm — *Ballroom B (CM)*

ABHP PART 1 PPW
2-5 pm — *Ballroom A (CM)*

ANSI N42.18
2-6 pm *Room 221 (CC)*

N13.59
2:30-4 pm *Room 206 (CC)*

PUBLIC EDUCATION COMMITTEE
2:30-4:30 pm *Conf Suite 420 (CM)*

AD HOC COMMITTEE - COMMUNICATIONS
4-5:30 pm *Room 208 (CC)*

ANSI N13.30
4-9 pm *Ontario (CM)*

Tuesday, June 12, 2001

AD HOC PART II PANEL
8 am-Noon *Ballroom F/G (CM)*

ANSI N13.48
8:30 am-Noon *Room 204 (CC)*

NRRPT
8:30 am-4:30 pm *Hope(CS)*

LAB ACCREDITATION POLICY COMMITTEE
9 am-Noon *Room 206 (CC)*

N13.53 NORM
2:30-6:30 pm *Ontario (CM)*

DOE PLUTONIUM WORKING GROUP
5:30-6:30 pm *Room 212B (CC)*

Wednesday, June 13, 2001

AFFILIATES COMMITTEE
7:30-9:30 am *Ballroom B/C (CM)*

AAHP CEC
8 am-Noon *Ontario (CM)*

DOE RADIOLOGICAL CONTROL (DRCCC)
8 am-5 pm *Ballroom A (CM)*

LEGIS & REG COMMITTEE
Noon - 2 pm *Room 204 (CC)*

ANSI N323C WORKING GROUP
1-5 pm *Room 208 (CC)*

Thursday, June 14, 2001

STANDARDS COMMITTEE
8 am-Noon *Huron (CM)*

HPS BOARD OF DIRECTORS
8 am-Noon *Erie/Superior (CM)*

PROGRAM COMMITTEE
Noon-2:30 pm *Ontario (CM)*

ASTM E10.04
1-4 pm *Room 104 (CM)*

SOUTH TEXAS CHAPTER'S WORKSHOP ON HOSTING SCIENCE TEACHER WORKSHOPS

Monday, June 11 - 7:00-10:00 PM, Marriott Ballrooms B/C

The South Texas Chapter (STC) will walk you through how they sponsor a workshop. This special "teach the teachers" training session promises to be helpful for prospective workshop presenters. Topics include sources of funding, logistics, how to announce your workshop and how to define your target group. They will offer insight to what works and what doesn't. If you were unable to attend this session last year in Denver don't miss it again!

HPS Science Bowl I

Wednesday, June 13 – 6:00-10:00 PM, Marriott Ballrooms B and C

Remember the G.E. College Quiz Bowl? This year the HPS will be hosting HPS Science Bowl I for Cleveland area high school teams based on the old College Quiz Bowl. Eight high school teams will be competing for trophies and individual medals in a three round per match competition.

In Round One, each student will be asked a science question with each correct answer being worth five points. The Second Round of each match will consist of toss-up questions with the team member buzzing in first answering the question. Each question in Round Two will be worth 10 points. In Round Three the 20 point questions are also in a toss up, but the first responding team member may confer with their teammates.

In Rounds Two and Three, if an incorrect answer is given by the first team, their opponent has the opportunity to give the correct answer and be rewarded the points for that question.

This is not only an educational event that will help the HPS recognize some outstanding science students, it is also a great deal of fun and an event that I hope we, as HPS members, will support by attending and cheering on the students. This event is a free event and one you may want to bring your family to if they are at the conference. Come for one match or all, but please help HPS show these science students that we recognize their effort and support them in their educational endeavors. This competition will show you just how bright our high school students are.

NOTE: If a paper is going to be presented by other than the first author, the presenter's name is underlined.

Monday

7:15 - 8:15 AM **Room: 230A**
CEL-1 Military Uses and Implications of Depleted Uranium. *R. E. Toohey; REAC/TS*

7:15 - 8:15 AM **Room: 205B**
CEL-2 The Very High Background Radiation Area in Ramsar Iran: Geology, Epidemiology, and Policy. *P. A. Karam; University of Rochester*

8:30 - 11:30 AM **Room: CC Music Hall**

Plenary Session

Chair: Paul S. Rohwer, HPS President

8:30 Introduction and Welcome. *Paul S. Rohwer, HPS President and Local Committee*

8:45 Introduction of G. William Morgan Lecturers. *Marvin Goldman, Chair, Presidents-Emeritus Committee*

9:00 Congressional Initiatives Related to Nuclear Technology and Radiation Safety. *The Honorable George Voinovich, State of Ohio, U. S. Senate*

9:30 Energy Employees Occupational Illness Compensation Program. *Martin S. Mathamel, CIH, ROH, Senior Policy Advisor, U.S. Department of Energy, Office of the Assistant Secretary for Environment, Safety and Health*

10:00 Break

10:30 The Relevance of Radiation Protection. *Nils Diaz, Commissioner, U.S. Nuclear Regulatory Commission*

Noon-1:30 PM
Exhibit Hall B

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits

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

1:30 - 3:00 PM **Room:CC Exhibit Hall**

P: Poster Session

ACCELERATOR

P.1 Theoretical Model of Neutron Production by Heavy Charged Particle Beams. *G. S. Braley, L. W. Townsend, F. A. Cucinotta; The University of Tennessee, and NASA Lyndon B. Johnson Space Center*

P.2 Manpower Requirements for Maintenance of The Radiation Safety Program at DOE Accelerator Facilities. *J. Salazar, L. S. Walker; Los Alamos National Laboratory*

COMPUTER

P.3 Integration of Computer Data Management Between Approved Users, Principal Research Investigators and the Radiation Safety Office at the Ohio State University. *R. Anderson, V. Burkes, D. Clum, J. Houchin, J. McGuire, R. Peterson; Ohio State University*

P.4 Database Tracking of Radiological Incidents. *C. Olson; Los Alamos National Laboratory*

P.5 Effectiveness of a Web-Based System For Creating Radiation Risk Statements. *R. Reiman, J. Dobbins, S. O'Hara, T. Yoshizumi; Duke University Medical Center, Children's Hospital Medical Center of Cincinnati*

Monday

P.6 RSAC-6 Atmospheric Accident Consequence Evaluation. *B. Schrader, D. Wenzel; Bechtel Idaho/Idaho State University*

P.7 Neyman-Pearson Confidence Intervals of the Form [yy.yy, xx.xx] For Paired Counting with Background Count to 1000 Counts. *W. Potter; Consultant, Sacramento, California*

DECOMMISSIONING

P.8 Remediation of Radioactive Contaminated Lagoon at LANL. *G. Lopez Escobedo, M. Bayless; Los Alamos National Laboratory*

P.9 Comparison of Site Characterization Using In-Situ Gamma Spec, Laboratory Gamma Spec, ICP-Mass Spec and Scanning GPS/Gamma Surveys at a Radiologically Contaminated Site. *M. Miller, A. Mohagheghi, S. Hoier, A. Lai, K. Baker; Roy F. Weston, Inc., Sandia National Laboratories, Environmental Restoration Group*

P.10 Estimates of Post-Decommissioning Radiation Dose Rates from the Georgia Tech Research Reactor. *H. Wooten, R.D. Ice, N.E. Hertel; Georgia Institute of Technology*

P.11 Georgia Institute of Technology Research Reactor Soil Survey. *E. Washington, R.D. Ice; Georgia Institute of Technology*

P.12 Tritium in Concrete at the Georgia Tech Research Reactor. *J. Sauber, R. Ice; Georgia Institute of Technology*

EMERGENCY PLANNING

P.13 Emergency Planning Considerations for the Chornobyl Nuclear Power Plant Site and Exclusion Zone. *V. Poyarkov, G. Vargo; Ukraine Ministry of Emergency Situations, Pacific Northwest National Laboratory*

ENVIRONMENTAL

P.14 Development of a Method for Converting In-Situ Gamma Spectra to Organ Doses. *AR. Al-Ghamdi, X. G. Xu.; Rensselaer Polytechnic Institute.*

P.15 A Meteorological Data Reconstruction Method at the Savannah River Site. *R. Harvey, A. Weber, R. Buckley, M. Parker; University of Michigan, Savannah River Site*

P.16 Homogeneity and Self-Absorption Considerations for Small Cylinder Geometries used during Soil Gamma Spectrometric Analysis. *J. Case, R. Dunker, R. Brey; Idaho State University*

P.17 Sorption Behavior of Cs-137 to Soils in Hong Kong Reservoir. *A.C.K. Man, I.Y.P. Cheung; Hong Kong Polytechnic University*

P.18 Stable Iodine Deficiency and Radioiodine Speciation-Dependent Thyroid Doses in the Vicinity of the Ignalina NPP. *T. Nedveckaite, K. Hart, V. Filistovic, E. Maceika, D. Hamby; Radiation Protection Department Institute of Physics, Oregon State University*

P.19 Prediction and Experimental Determination of ^{86}Rb Migration in a Simulated Freshwater Ecosystem. *W. L. Duffy, K. A. Higley; Oregon State University*

P.20 Assessing Potential Risks from Exposure to Natural Uranium in Well Water: Nambe, New Mexico. *P.R. Fresquez, A.C. Hakonson-Hayes, F.W. Whicker; Los Alamos National Laboratory, Colorado State University*

EXTERNAL DOSIMETRY

P.21 An Evaluation of Models to Estimate Missed Dose in Retrospective Dose Assessments. *T. Taulbee, J. Neton, M. Lennard, A. Feng; National Insititute for Occupational Safety and Health*

Monday

P.22 Development of Biologically-Based Radiation Dosimetry. *D.P. Wells, L.C. Deveaux, E. L. Roethlisberger, T.F. Gesell; Idaho State University*

P.23 Dose And Dose Rate Prediction for Solar Particle Events using a Dosimetry-Based Bayesian Forecasting Methodology. *J. S. Neal, L. W. Townsend; The University of Tennessee*

P.24 Calculation of Bremsstrahlung Energy Distributions for First and Second Forbidden Beta Transitions in Different Absorbers. *J. S. Kim, G. Chabot; University of Massachusetts in Lowell*

P.25 Quality Assurance and Control Procedures for Area Dosimeters Developed for a Shielding Integrity Survey. *A. Arndt, R. Brey; Idaho State University*

P.26 An MCNP Examination of Electron Backscattering. *C. Frujinoiu, R. Brey, T. Gesell; Idaho State University*

P.27 Studying the Effects of the Surrounding Media and Source Distance to the Absorbed Organ Dose using the Image-Based VIP-Man Anatomical Model and the Monte Carlo Method. *T. Zhang, A. Bozkurt, T.C. Chao, X. G. Xu; Rensselaer Polytechnic Institute, Harran University, Turkey*

P.28 Calibration of High-Dose LiF Crystal Optical Dosimeters. *N. Gee, R. Brey; Idaho State Unversity*

INSTRUMENTATION

P.29 Calibration of a Gamma Calibration Well with an Energy-Compensated Geiger-Mueller (G-M) Tube. *G. George, D. Seagraves; Los Alamos National Laboratory*

P.30 Evaluation of Portable Counting Instruments for Tc-99m and I-131 Contamination Surveys. *T. Paul, J. Mueller; UCLA Radiation Oncology Department, Amgen, Inc.*

P.31 Detection and Activity Determination Methods for Low-Energy Gamma Emitting Hot Particles. *S. Menn, K. Higley; Oregon State University*

P.32 Windowless Electret Ion Chambers for Absolute Measurement of Energy or Disintegration Rate of Alpha Sources. *P. Kotrappa, S.K. Dua, R. Srivastava, M.A. Ebadian, L.R. Stieff; Rad Elec Inc., Florida International University*

P.33 Environmental Testing of Radiation Instruments at Savannah River Site. *G. Taylor; Westinghouse Savannah River Company*

P.34 Evaluation of a Lithiated Sol-Gel Glass Neutron Detector. *A. Stephan, S. Wallace, P. Womble, L. Miller, S. Dai; University of Tennessee, Western Kentucky University, Oak Ridge National Laboratory*

P.35 Evaluation of Static and Scan Minimum Detectable Concentrations for Radiological Survey Instruments used in Final Radiation Surveys. *R. S. Clement; U.S. Nuclear Regulatory Commission, MD*

INTERNAL DOSIMETRY

P.36 Bayesian Internal Dosimetry Calculations using Markov Chain Monte Carlo (MCMC). *G. Miller, H. Martz, T. Little; Los Alamos National Laboratory*

P.37 Radioanalytical Data Interpretation when the Ratio Reading/Median is Lognormally Distributed. *W. J. Klemm, A. Brodsky, D. M. Schaeffer; Science Applications International Corporation, Department of Defense, VA*

P.38 Estimating Population Doses from Plutonium from Fission Track Analysis and Autopsy Data. *N. M. Barss, A. Brodsky, E. Jackson; Science Applications International Corporation, Naval Hospital Charleston*

Monday

P.39 ICRP-66 Respiratory Tract Model: Uncertainties in the Dosimetry Model. *E. Farfan, C. H. Huh, T. E. Huston, W. E. Bolch; University of Florida*

P.40 ICRP-66 Respiratory Tract Model: Parameter Sensitivity Analysis. *C. H. Huh, E. Farfan, T. E. Huston, W. E. Bolch; University of Florida*

P.41 Doses from Radionuclide Inhalation for Nuclear Power Plant Workers and the Utility of Respiratory Protection Programs. *I. Linkov, D. Burmistrov, M. Ellenbecker; Menzie-Cura & Associates, Inc.*

MEDICAL

P.42 Health Physics Aspects in the use of Y-90 Therasphere® for the Treatment of Hepatocellular Carcinoma. *M. Sheetz, J. Rosen, K. Bohner, H. Irwin, D. Whitt, L. Collins; University of Pittsburgh*

P.43 Current Medical Health Physics Practice in a Large Academic Medical Center. *T. Yoshizumi, R. Reiman, V. Vylet; Duke University Medical Center*

P.44 Beam Characterization of a Clinical Accelerator. *C. Shi, T-c. Chao, X. G. Xu; Rensselaer Polytechnic University*

P.45 Monte Carlo Investigation of Photoneutron Sources for Boron Neutron Capture Therapy. *W. Scates, F. Harmon, D. Nigg, Y. Harker, D. Wells; Idaho State University, Idaho National Engineering and Environmental Laboratory*

OPERATIONAL

P.46 Cancelled

P.47 Historical Site Assessments - They're not Just for Decommissioning Anymore. *R. Aker; New Horizon Scientific*

P.48 RPAS Radiation Survey Automation at LANSCE. *W.J. Wenzel, R.L. Campbell, J.L. Bliss; Los Alamos National Laboratory*

REGULATORY/LEGAL

P.49 New Regulations and Guidance for Dealing with Radioactivity in Solid Waste in Pennsylvania. *D. Allard, W.P. Kirk; Pennsylvania Department of Environmental Protection*

WASTE MANAGEMENT

P.50 (Previously MPM-B7) Assessing the Consequences of an In-Package Criticality Event at a High-Level Nuclear Waste Repository. *J. Weldy, M. Rahimi, S. Mohanty; Center for Nuclear Waste Regulatory Analyses, U.S. Nuclear Regulatory Commission, MD*

WORKS IN PROGRESS

P.51 Rotoclave System used to Treat Medical Waste - A Novel Approach. *J. E. Spann, S. M. Mohaptra, J. E. Glenn; Washington Hospital Center*

P.52 Off-site Source Recovery (OSR) Project. *J. A. Tompkins, L. Leonard, S. Leonard, M. W. Pearson, J. McAlpin; Los Alamos National Laboratory*

P.53 Rapid Separation and Analysis of ^{99}Tc in Surface and Groundwaters using Empore Solid Phase Extraction Membranes. *R. T. Shannon, W. Cavin, R. Osejo; Acculabs, Inc., Consultant, Portland, OR, TN & Associates*

P.54 Dose and Flux Analysis of a Plasma Focus Facility using MCNP. *M. Arno; Texas A&M University*

P.55 A Report and Comparison of U.S. Nuclear Power Plant Gaseous and Liquid Effluent Releases from 1994-1999. *J. T. Harris, D. W. Miller; University of Illinois at Urbana-Champaign*

P.56 Comparison of the MIRD Equations for Calculating Radiation Absorbed Doses. *E. S. Niven, C. Nahmias; McMaster University and McMaster University Medical Centre, Canada*

Monday

P.57 Dry Storage Disposition of the Three Mile Island Unit 2 (TMI-2) Core Debris. *G. G. Hall; Idaho National Engineering and Environmental Laboratory (INEEL)*

P.58 Development of a Portable Thyroid Monitor System. *T. Yoshizumi, D. Jorgensen, M. Sarder, V. Vylet; Duke University Medical Center*

P.59 Scanning Spectrometer Surveys for Areas Surrounding Nuclear Facilities. *J. J. Shonka, D. Debord, R. Burmeister, R. Burns, M. Marcial, R. Turner; Shonka Research Associates Inc.*

P.60 X-Ray Fluorescence of Thoriated Tungsten. *D.M. Peterson; Francis Marion University*

P.61 Mound Laboratory Historical Internal Dose Reconstruction. *J. L. Anderson, E. M. Brackett, D. A. Dooley; MJW Corporation*

P.62 Uranium in Well Water Near Simpsonville, SC. *R. L. Woodruff, T. A. DeVol, J. D. Navratil, B. Ayez; Clemson University, Istanbul Technical University, Turkey*

P.63 Extremity Dose Control Challenges in Radiopharmaceutical Research and Manufacturing. *J. R. Laferriere; DuPont Pharmaceuticals Company*

P.64 Measurement of the Neutron Flux in the Vicinity of an Electron Accelerator. *D. W. Jokisch, J. M. Watson, T. Hyman; Francis Marion University, McLeod Regional Hospital*

P.65 Radioprotection Evaluations Relative to the Use of Depleted Uranium in Kosovo. *A.Benedetti; Centro Interforze Studi Applicazioni militari - Ministero della Difesa - Italia*

P.66 Abandoned Uranium Mines: A Continuing Legacy for the Navajo Nation. *A. G. Sowder, S. D. Hernandez, A. Bain, L. W. Setlow, E. Forinash; AAAS Environmental Fellow, US Environmental Protection Agency, DC and CA*

P.67 Effects of Particulate Deposition in Air Monitoring System - Case Study of an Aging Facility. *J. A. Glissmeyer, K. A. Hadley, L. P. Diediker; Pacific Northwest National Laboratory, Fluor Hanford*

P.68 A New Method for Performing *In Vivo* Efficiency Calibration Measurements Suitable for Chestwall Thicknesses in Excess of 4 CM. *A. Robbins, H. Spitz, D. Johnson, D. Stempfley, J. Hudson; University of Cincinnati*

P.69 PRESCILA PROTON RECOIL SCINTILLATOR – LOS ALAMOS Lightweight Neutron REM Meter. *R. H. Olsher, D. T. Seagraves, R. O. Murphy; Los Alamos National Laboratory*

3:00 - 4:00 PM **Room: CC 230A**

MPM-A:Regulatory/Legal

Co-Chairs: Alan Fellman and Nidal Azzam

3:00 PM **MPM-A.1**
Radiation Protection and the Precautionary Principle. *K. Mossman, G. Marchant; Arizona State University*

3:15 PM **MPM-A.2**
DOE Office of Safety and Health Radiation Protection Standards. *P. O'Connell, J. Foulke, J. Rabovsky, R. Loesch; U.S. Department of Energy*

3:30 PM **MPM-A.3**
The Case of Radioactive Contaminated Pillow - A Case Study. *G. Hamawy; Columbia University*

3:45 PM **MPM-A.4**
Interstitial Lung Disease of Occupational Origin: A Case Report. *J. Russell; Washington State University*

Monday

4:00 - 5:00 PM **Room: CC 230A**

MPM-A:Risk Analysis

Co-Chairs: Alan Fellman and Nidal Azzam

4:00 PM **MPM-A.5**
Platforms, Modularity, and the Future of Regulatory Environmental Pathway Modeling. *A. Sowder, W. Chiu, C. Hung, A. Wolbarst; U.S. Environmental Protection Agency, DC*

4:15 PM **MPM-A.6**
Intakes of Plutonium Produce One-Fourth the Risk when Human Susceptibility Data are used for Risk Assessment. *D. J. Strom, B. A. Napier, P. S. Stansbury, S. F. Snyder, R. D. Stewart; Pacific Northwest National Laboratory*

4:30 PM **MPM-A.7**
A Novel Cytogenetic Biodosimetry Method for Health Risk Analysis using Human Resting Peripheral Blood Lymphocytes. *P.G.S. Prasanna, U. Subramanian, R.G. Greenhill, W.F. Blakely; Armed Forces Radiobiology Research Institute*

4:45 PM **MPM-A.8**
Radiological Risks Associated with Depleted Uranium Munitions and Armor. *O. Raabe; University of California*

3:00 - 4:30 PM **Room CC 230B**

MPM-B:Waste Management

Chair: Pete Myers

3:00 PM **MPM-B.1**
Radioactive Waste Minimization at a Large Academic Medical Facility. *K. Krieger, C. Walters; UTMB at Galveston, Texas A&M University*

3:15 PM **MPM-B.2**
A Waste Minimization Success at Sandia National Laboratories Environmental Restoration Project. *S. Hoier, J. Pavletich, M. Miller, T. Tharp; Sandia National Labs, Gram Inc., Roy F. Weston Inc.*

3:30 PM **MPM-B.3**
Two Sample Preparation Methods for Measuring ^{3}H and ^{14}C in Incinerator Ash and Spent Lime. *B. Edwards, L.-X. Thai, D. Sprau; Duke University Medical Center, University of North Carolina at Chapel Hill, East Carolina University*

3:45 PM **MPM-B.4**
Accelerator-Based X-Ray Fluorescence (AXRF) for Waste Assays and Environmental Applications. *D.P. Wells, J.E. Kwofie, F. Selim, J.F. Harmon, W. Scates, R. Spaulding; Idaho State University*

4:00 PM **MPM-B.5**
Incorporation of the MELCOR Code into the Preclosure Consequence Analyses for the Yucca Mountain Project. *R.R. Benke, B. Dasgupta, D. Daruwalla, A.H. Chowdhury, B. Jagannath; Center for Nuclear Waste Regulatory Analyses, U.S. Nuclear Regulatory Commission*

4:15 PM **MPM-B.6**
Measurement of Alpha Surface Contamination up to 80,000 Bq/cm2 for SCO Characteriztion. *R. Morris, D. Hankins, B. Smith; Rocky Flats Environmental Technology Site, The Alpha Group & Associates, LLC*

Moved to P.50 **MPM-B.7**

Monday

3:00 - 5:00 PM **Room: CC 205B**

MPM-C: Government Section Session Part 1: The International Atom

Co-Chairs: Frank Bradley and Tom Bell

3:00 PM **MPM-C.1**
Origin and Implementation of the IAEA Model Project for Improving the Radiation Control Programs in Developing Countries. *L. Rogers; Consultant, IAEA, Scottsdale, Arizona*

3:30 PM **MPM-C.2**
NRC Export and Import Requirements. *C. Paperiello; U.S. Nuclear Regulatory Commission, MD*

4:00 PM **MPM-C.3**
International Movement of Radioactive Material, Industries' View. *L. Hendrickson; Isotope Products Laboratories*

4:30 PM **MPM-C.4**
Radiation Control in Developing Countries. *F. J. Bradley; Consultant, New York NY*

3:00 - 4:45 PM **Room: CC 212B**

MPM-D: External Dosimetry

Co-Chairs: Scottie Walker and Jack Fix

3:00 PM **MPM-D.1**
External Radiation Exposure in a Cohort of U.S. Radiologic Technologists (1977-1998). *J.W. Neton, T.B. Wenzl, J. Ju, J.J. Cardarelli, M.M. Doody, D. M. Freeman, A. K. Mohan, B. H. Alexander; National Institute for Occupational Safety and Health, OH, National Cancer Institute, MD, University of Minnesota*

3:15 PM **MPM-D.2**
Reduction of Radiation Dose to the Fingers by Protective Clothing. *R.J. Traub, B.A. Rathbone; Pacific Northwest National Laboratory*

3:30 PM **MPM-D.3**
Comparison of Effective Dose to Bone Marrow Dose for Solar Particle Events and Annual GCR Spectra. *J. Hoff, L. Townsend, E. N. Zapp; University of Tennessee, Wyle Laboratories, Inc.*

3:45 PM **MPM-D.4**
Dose Evaluation of a Proposed Mars Habitat Module. *D. L. Stephens, Jr., J. L. Hoff, T. Miller, D. Evans, B. Rasmussen, P. Mink; University of Tennnessee*

4:00 PM **MPM-D.5**
Evaluation and Adaptation of an Aqueous Coumarin Dosimeter for use in Mixed Neutron-Gamma Radiation Fields. *E. Denison; The Ohio State University*

4:15 PM **MPM-D.6**
A New System for Evaluating Neutron-Induced Tracks in CR-39 using Coherent Light Scattering. *H.J. Gepford, N.E. Hertel, M.E. Moore, R.E. Hermes, R.T. Devine; Georgia Institute of Technology, Los Alamos National Laboratory*

4:30 PM **MPM-D.7**
Development of a Neutron Dose Algorithm for an Albedo Whole Body TLD that Possesses Non-Uniform Filtration over Neutron Sensitive and Non-Sensitive Elements. *J. Cassata, E. Ruesch, E. Pieski, R. Laird, M. Nelson, L. Kennemur; US Naval Academy*

6:00 - 7:30 PM **Room: Marriott Ballroom D**

MPM-E: Current Issues in Health Physics Instrumentation

Chair: Morgan Cox

6:00 PM **MPM-E.1**
Eberline RO-7 Instrumentation Used at the West Valley Demonstration Project for Dose Rate Measurements Inside a High Level Waste Tank. *W. Schaper; WVDP*

Monday

6:15 PM **MPM-E.2**
An Overview of Health Physics Instrument Training. *T. Voss; Los Alamos National Laboratory*

6:30 PM **MPM-E.3**
Application of High Speed Digital Electronics/Signal Processing (DSP) and Software to Portable Radiation Detectors. *P. R. Steinmeyer; Radiation Safety Associates, Inc.*

6:45 PM **MPM-E.4**
Continuing Measurements of Radiation Levels at Airliner Altitudes. *M. Cox; Lovelace Respiratory Research Institute*

7:00 PM **MPM-E.5**
Health Physics Technician Injury Reduction Initiative. *S. L. Bump; Fluor-Hanford*

7:15 PM **MPM-E.6**
Modified A. I. L. Gamma Used at the West Valley Demonstration Project for Curie Measurements Inside a High Level Waste Tank. *W. Schaper, WVDP*

Tuesday

7:15 - 8:15 AM **Room: 230A**

CEL-3 New Regulations and Guidance for Dealing With Radioactivity in Solid Waste in Pennsylvania. *D.J. Allard and W.P. Kirk (Pennsylvania Department of Environmental Protection*

7:15 - 8:15 AM **Room: 205B**

CEL-4 Intravascular Brachytherapy: An RSO's Perspective. *S. A. Sorensen; Saint Luke's Hospital of Kansas City*

8:30 - 10:30 AM **Room: CC 230A**

TAM-A: Medical

Co-Chairs: David Hintenlang and George Snyder

Cancelled **TAM-A.1**

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

A Method for Estimating, Standardizing, and Reporting Radiation Exposure to Patients from Diagnostic Radiological Examinations. *C. Cagnon, R. Gaylord, T. Paul; University of California Los Angeles, Lawrence Livermore National Laboratory*

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

Radiation Exposures and Safety Issues in Cardiovascular Brachytherapy. *S. M. Mohapatra, B. G. Bass; Washington Hospital Center*

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

Radiation Doses in Pediatric Cardiac Catheterization. *A. Al-Haj, A. Lobriguito; King Faisal Specialist Hospital & Research Centre, Saudi Arabia*

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

A Method of Recording and Analyzing Pediatric Fluoroscopy Procedures for the Determination of Individual Organ Doses. *J. Sessions, F. Pazik, M. Arreola, J. Williams, L.G. Bouchet, W.E. Bolch; University of Florida*

9:30 AM **BREAK**

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

Comparison of Mean Glandular Doses using Tissue Equivalent Mammographic Phantoms. *P. Argo, K. Hintenlang, D. Hintenlang; University of Florida*

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

Comparison of Measured Effective Doses using Tomographic Phantoms and the MIRD-Stylized Phantom. *J. Roshau, K. Hintenlang, J. Naughton, D. Hintenlang; University of Florida*

10:30 AM Medical Section Business Meeting

8:15 - 11:45 AM **Room: CC 230B**

TAM-B:Internal Dosimetry

Co-Chairs: Charles (Gus) Potter and Tom LaBone

8:15 AM **TAM-B.1**

Fetoplacental Dosimetry of Plutonium Burdens Incurred Prior to Pregnancy. *M. Sikov, J. Russell; Washington State University*

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

Development of a Routine Bioassay Program for Athyroid Individuals using a Pseudo Uptake Retention Function. *C. Potter, T. Culp; Sandia National Laboratories*

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

K-Operator: A New Tool for Interpreting Bioassay Results Based on a Whole-Body Retention Function. *C. Sun; Brookhaven National Laboratory*

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

Application of a Matrix Calibration Method for In Vivo Measurement of ^{241}Am in the Lungs, Liver and Skeleton. *J. Hudson, D. Stempfley, H. Spitz, J. Neton; University of Cincinnati*

Tuesday

9:15 AM **TAM-B.5**
The Department of Energy Laboratory Accreditation Program for Radiobioassay. *R. Loesch; US Department of Energy, MD*

9:30 AM **TAM-B.6**
Patient-Specific Radiation Absorbed Dose from FDG to Infants Weighing Less than 1500 Grams. *E. Niven, C. Nahmias; McMaster University, Canada*

9:45 AM **BREAK**

10:15 AM **TAM-B.7**
Calculation of Specific Absorbed Fraction for Source in Gastrointestinal Tract. *T.-c. Chao, X. G. Xu; Rensselaer Polytechnic Institute*

10:30 AM **TAM-B.8**
In-Vivo Measurements of the GI Tract Wall Thicknessess using Endoscopic Ultrasound: Applications to Internal Dosimetry. *C. Huh, W. Bolch, M. Bhutani, E. Farfan; University of Florida*

10:45 AM **TAM-B.9**
Long-Term Retention of Alkaline Earth Elements in Bone Volume Based on Bone Mineral Density Measurements. *A. I. Apostoaei; SENES Oak Ridge, Inc.*

11:00 AM **TAM-B.10**
Calculation of Heavy Charged Particle Absorbed Fractions in Trabecular Bone. *C. Watchman, K. Vo, D. Rajon, A. Shah, W. Bolch; University of Florida*

11:15 AM **TAM-B.11**
Chord Length Distribution Measurements Through 3D NMR Images of Trabecular Bone Samples. *D. Rajon, D. Jokisch, P. Patton, A. Shah, C. Watchman, W. Bolch; University of Florida, Francis Marion University, University of Nevada, Las Vegas*

11:30 AM **TAM-B.12**
Geometrical Variations in Adipocyte Distribution for Skeletal Dosimetry Models: Considerations for 3D Electron Simulations. *A. Shah, P. Patton, D. Rajon, W. Bolch; University of Florida, University of Nevada, Las Vegas*

8:30 - 11:00 AM **Room: CC 205B**

TAM-C: Government Section Session Part 2: Non-Ionizing

Co-Chairs: Frank Bradley and Ken Barat

8:30 AM **TAM-C.1**
Mobile Phones and Health **(G. William Morgan Lecture)**. *L. Challis; University of Nottingham, England*

9:00 AM **TAM-C.2**
Changes in Radiation Safety Standards for Laser Products – A Status Report. *C. Figueroa, J. Dennis; US Food and Drug Administration, MD*

9:30 AM **TAM-C.3**
Optical Accelerator: An Ionizing and Non-Ionizing Safety Perspective. *K. Barat, W. Leemans, P. Catravas, D. Rodgers, A. Smith; Lawrence Berkeley National Laboratory*

10:00 AM **BREAK**

10:30 AM **TAM-C.4**
Review of Non-Ionizing Accidents and Incidents, Laser and Ultra-Violet Sources. *K. Barat; Lawrence Berkeley National Laboratory*

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

Tuesday

8:15 - 10:45 AM Room: CC 212B

TAM-D: Accelerator Section Session

Chair: Scott Schwahn

8:15 AM TAM-D.1
Current Status of Japanese Accelerator Safety. **(G. William Morgan Lecture)** *T. Nakamura; Tohoku University, Japan*

9:00 AM TAM-D.2
ANSI Standard N43.1: Radiological Safety for the Design and Operation of Particle Accelerators. *J. Liu, L. S. Walker; Los Alamos National Laboratory*

9:15 AM TAM-D.3
RF Recovery Accelerator Technology and Inherent Accident Mitigation Features. *D. Douglas, R. T. May; Thomas Jefferson National Accelerator Facility*

9:30 AM TAM-D.4
Commissioning of a 7.5T Wiggler at a 1.5GeV Synchrotron Source. *L.Day; CAMD-Louisiana State University*

9:45 AM BREAK

Cancelled TAM-D.5

Cancelled TAM-D.6

10:15 AM TAM-D.7
Neutron Dose Rate Instrumentation Inter-Comparison. *L. S. Walker, L. Miles, D. Olsher, R. Harris; Los Alamos National Laboratory*

10:30 AM TAM-D.8
Energy Response Testing of the Eagle Neutron Rem Meter. *R. H. Olsher, L. S. Walker, H. H. Hsu; Los Alamos National Laboratory*

10:45 AM Accelerator Section Business Meeting

2:15 - 5:15 PM Room: CC 230A

TPM-A: ABHP

Co-Chairs: Lee Booth and Bob Miltenberger

2:15 PM TPM-A.1
Results of the Job Task Analysis. *G. Vargo; Pacific Northwest National Laboratory*

2:45 PM TPM-A.2
The ABHP Decision to Restructure the Part II Exam. *B. Miltenberger; Brookhaven National Laboratory*

3:15 PM TPM-A.3
Composition of the ad hoc Part II Revision Team. *E. Maher; Duke Engineering & Services*

3:30 PM BREAK

4:00 PM TPM-A.4
Developing Questions for the Revised Part II exam. *J. Hecht; Credentialing Services, Inc.*

4:30 PM TPM-A.5
Examples of Part II questions from the Part II Revision Team. *Team Member*

4:45 PM Panel for Questions and Answers

2:30 - 5:30 PM Room: CC 230B

TPM-B: Release of NCRP Report on Linearity

Co-Chairs: Charles Meinhold and Art Upton

2:30 PM TPM-B.1
A Critical Re-evaluation of the Dose-Response Relationships for Genetic and Carcinogenic Effects of Low-Level Ionizing Radiation. *A. Upton; NCRP Scientific Committee 1-6*

Tuesday

3:00 PM **TPM-B.2**
What Information do Radiation-Induced Cellular and Molecular Alterations Provide for Low Dose Cancer Risk Assessments? (NCRP SC 1-6) *R. J. Preston; U.S. Environmental Protection Agency, NC*

3:30 PM **TPM-B.3**
Radiation Dose-Neoplasm Response Relationships and Factors that Influence Them in Experimental Animals. *K. H. Clifton; NCRP Scientific Committee 1-6*

4:00 PM **BREAK**

4:30 PM **TPM-B.4**
What Do Radiation Epidemiology Data Tell Us About the Linear Non-Threshold Hypothesis? *R. E. Shore; New York University School of Medicine*

5:00 PM **Panel Discussion**
Charles Meinhold, National Council on Radiation Protection and Measurements

2:15 - 4:45 PM **Room: CC 205B**

TPM-C: RSO Section Session

Chair: Bobby Wilson

2:15 PM **TPM-C.1**
Radiation Safety Training for Nuclear Cardiologists. *C. A. Ribaudo; The National Institutes of Health*

2:30 PM **TPM-C.2**
Resolution of NaI(TL) Detector by Gamma Spectroscopy of Cs-137 Source and Statistical Analyses of Cs-137 Decay using Various Ortec NIM Instruments. *A. Ong; Dartmouth College*

2:45 PM **TPM-C.3**
RSO Input to an ANSI Working Group on Internal Dosimetry Standards. *F. E. Gallagher; University of California, Irvine*

3:15 PM **TPM-C.4**
Use of Radioactive Material by Minors. *N. E. Newman; The National Institutes of Health*

3:30 PM **TPM-C.5**
An Analysis of Reported Misadministration and Dose Irregularity Incidents in Texas for the Development of Intervention Strategies. *M. A. Charlton, R. J. Emery; University of Texas Health Science Center at San Antonio and Houston*

3:45 PM **BREAK**

4:15 PM **TPM-C.6**
HPS Services to RSOs. *R. Johnson; CSI-Radiation Safety Academy*

4:30 PM **TPM-C.7**
Results of a Pilot Radiation Safety Compliance Incentive Program. *R. Emery, M. Charlton; University of Texas Health Science Center at Houston and San Antonio*

4:45 PM **RSO Section Business Meeting**

2:15 - 5:15 PM **Room: CC 212B**

TPM-D: Special Session: Plutonium Exposure at LANL

Co-Chairs: David Wannigman and Yung-Sung Cheng

2:15 PM **TPM-D.1**
Description of the Incident. *J. L. Brown; Los Alamos National Laboratory*

2:45 PM **TPM-D.2**
Immediate Response to the 3/16/2000 Los Alamos Plutonium Facility Contamination Event. *P. S. Hoover, R. C. Stokes; Los Alamos National Laboratory*

3:00 PM **TPM-D.3**
The DOE Accident Investigation of the Plutonium-238 Multiple Intake Event at the Plutonium Facility, Los Alamos National Laboratory. *D. Minnema; U.S. Department Of Energy, MD*

Tuesday

3:15 PM **TPM-D.4**
Worker Exposure and Continuous Air Monitor Response as Related to Pu-238 Aerosol Dispersion: A Case Study. *J. J. Whicker, D. Wannigman; Los Alamos National Laboratory*

3:30 PM **TPM-D.5**
Characterization of Pu Aerosol from a LANL Exposure. *Y. S. Cheng, R. A. Guilmette, M. D. Hoover, Y. Zhou, J. J. Whicker; Lovelace Respiratory Research Institute, Los Alamos National Laboratory, NIOSH*

3:45 PM **BREAK**

4:15 PM **TPM-D.6**
Direct Bioassay of an Individual Following Inhalation Intake of Plutonium-238. *M. Ennis, E. Miller, C. Phillips, K. Auer, R. Devine, D. Vasilik; Los Alamos National Laboratory*

4:30 PM **TPM-D.7**
Chelation Therapy and the Internal Dosimetrist. *T. La Bone, G. Miller; Savannah River Site, Los Alamos National Laboratory*

4:45 PM **TPM-D.8**
Internal Dose Calculations for March 16, 2000 Pu-238 Incident at Los Alamos National Laboratory (LANL). *G. Miller, T. Little, R. Guilmette; Los Alamos National Laboratory*

5:00 PM **TPM-D.9**
Lessons Learned and Corrective Actions from the 3/16/00 Incident. *T. G. George; Los Alamos National Laboratory*

Wednesday

7:15 - 8:15 AM **Room: 230A**

CEL-5 Issues in Intravascular Radiation Therapy. *M. G. Stabin; Vanderbilt University*

7:15 - 8:15 AM **Room: 205B**

CEL-6 NCRP Report on the Management of Terrorist Events Involving Radioactive Materials. *J.W. Poston, Sr., C. Abdelnour, E.J. Ainsworth, S. Becker, R.L. Brittigan, I.S. Hamilton, E.E. Hickey, D.A. Kelm, F.A. Mettler, Jr., J.M. Thompson, M.C. Wrobel, E. Kearsley; Texas A&M University, Defense Threat Reduction Agency, Virginia, Maryland, University of Alabama at Birmingham, Pacific Northwest Laboratories, Illinois Department of Nuclear Safety, University of New Mexico School of Medicine, Department of Energy, Aiken, South Carolina, Bolling AFB, National Council on Radiation Protection and Measurements*

8:15 - 10:00 AM **Room: CC 230A**

WAM-A: Decommissioning

Co-Chairs: Joe Shonka and Dick Sexton

8:15 AM **WAM-A.1**

Training the Decommissioning Health Physicist. *A. Fellman; CSI Radiation Safety Academy*

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

Decontamination of Building and Equipment Surfaces Contaminated as the Result of a Historical Americium Spill. *S. Passig, W. Lilly, J. Moos; Science Applications International Corporation, Southeast Missouri State University*

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

Bioassay to Determine Exposures from a Historical Americium Spill. *K. Fleming, W. Lilly, J. Moos; Science Applications International Corporation, Southeast Missouri State University*

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

Use of Two-Stage or Double Sampling in Final Status Decommissioning Surveys. *C. Gogolak; U.S. Department of Energy, NY*

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

Demonstrating Comparability between Field Gamma Spectroscopy and Laboratory Analysis in Reactor Decommissioning. *L. Luckett, P. Kalb, K. Miller, C. Gogolak, L. Milian; URS Corporation, Brookhaven National Laboratory, U.S. Department of Energy, NY*

9:30 AM **WAM-A.6**

Decontamination and Decommissioning of the Iowa State UTR-10 Research Reactor. *M. Granus, F. Gardner, D. Bullen, S. Wendt; Duke Engineering & Services, Inc., Iowa State University*

9:45 AM **WAM-A.7**

Georgia Tech Research Reactor (GTRR) Decommissioning Surprises. *N.E. Hertel, R.D. Ice; Georgia Institute of Technology*

10:00 AM **BREAK**

10:30 - 11:30 AM **Room: CC 230A**

WAM-A: Decommissioning Section Session

Co-Chairs: Eric Abelquist and Greg Chapman

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

D&D and the Conference of Radiation Control Program Directors - Activities and Future Goals. *D. McBaugh; Conference of Radiation Control Program Directors*

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

Nuclide Suites for the Decommissioning of Maine Yankee Atomic Power Plant. *J. Darman; Millennium Services Inc.*

Wednesday

11:00 AM **WAM-A.10**
MARSSIM Final Status Survey Design for Multiple Radionuclides in Class 1 Survey Units: Determining the Need for Additional Soil Samples Based on Scan MDC. *E. Abelquist; ORISE*

11:15 AM **WAM-A.11**
Lessons Learned from Implementation of MARSSIM at Reactor and Materials License Decommissioning Sites. *R. S. Clement; U.S. Nuclear Regulatory Commission, MD*

11:30 AM Decommissioning Section BusinessMeeting

8:15 AM - Noon **Room: CC 230B**

WAM-B: Special Session: Reassessment of A Bomb Radiation Dosimetry

Co-Chairs: George Kerr and R. F. Christy

8:15 AM **WAM-B.1**
The U.S. Working Group on the Reassessment of A-Bomb Dosimetry. *R. Young; U.S. Working Group on the Reassessment of A-Bomb Dosimetry*

8:30 AM **WAM-B.2**
Epidemiologic Studies at the Radiation Effects Research Foundation (RERF) and Dosimetric Needs. *S. Nagataki; Japanese Working Group on Reassessment of A-Bomb Dosimetry*

8:45 AM **WAM-B.3**
Report of the National Academy of Sciences Committee on RERF Dosimetry. *W. K. Sinclair; NCRP*

9:00 AM **WAM-B.4**
Neutron Activation Measurements in Hiroshima and Nagasaki. *T. Straume, A. Marchetti, W. Rühm, P. Men, J. McAninch, G. Korschinek, T. Faestermann, K. Knie, G. Rugel, A. Wallner, K. Shizuma, M. Hoshi, S. Fujita; University of Utah, Lawrence Livermore National Laboratory, Technical University of Munich, Germany, Hiroshima University, Japan, Radiation Effects Research Foundation*

9:15 AM **WAM-B.5**
The RERF in Situ Dosimetry Measurements Database and Measurement Evaluation. *H. Cullings, W. Lowder, H. Beck, S. Fujita, T. Maruyama, K. Shizuma; RERF, U.S. Department of Energy, NY, Retired, Radiation Effects Association, Hiroshima University, Japan*

9:30 AM **WAM-B.6**
Proposed Revisions to DS86 House and Terrain Shielding Models. *D. C. Kaul, S. D. Egbert, J. A. Roberts; Science Applications International Corporation*

9:45 AM **BREAK**

10:15 AM **WAM-B.7**
Radiation Dose Reevaluation for the Nagasaki Factory Workers. *R. Santoro, Y. Azmy, G. Kerr; Oak Ridge National Laboratory, Kerr Consulting Company*

10:30 AM **WAM-B.8**
Proof-Of-Principle to Unfold an Angle-Energy Dependent Neutron Source from Measurements and Adjoint Discrete-Ordinates Calculations. *J. V. Pace III; Oak Ridge National Laboratory*

10:45 AM **WAM-B.9**
Monte Carlo Modeling of the Hiroshima Bomb. *P. Whalen, S. White; Los Alamos National Laboratory*

11:00 AM **Panel Discussion**
Joseph Weiss, David Thomassen, U.S. Department of Energy

Wednesday

8:15 - 11:00 AM Room: CC 205B

WAM-C: Environmental

Co-Chairs: Steve Simon and Thomas Gesell

8:15 AM WAM-C.1
Scintillating Extraction Chromatography Coupled with Pulse Height Spectrum Analysis for Actinide Separation and Analysis. *J. E. Roane, T. A. Devol; Clemson University*

8:30 AM WAM-C.2
Sorption of Selected Actinides on Sedimentary Interbeds from the Snake River Plain. *C.J. Grossman, J.T. Coates, R.A. Fjeld; Clemson University*

8:45 AM WAM-C.3
Methods and Findings of a Radiological Survey and Remediation Program of Johnston Island. *S. Simon; Consultant, Washington, DC*

9:00 AM WAM-C.4
Efficiency Calibration of a Mobile Radiation Detection System for use during CERCLA Remedial Actions. *J. Giles; Idaho National Engineering and Environmental Laboratory*

9:15 AM WAM-C.5
Measurement of Natural Gamma Radioactivity Levels in Soil in the Zacatecas and Guadalupe Counties. *F. Mireles, L. L. Quirino, I. Davila, J. F. Lugo, J. L. Pinedo, C. Rios; Universidad Autónoma de Zacatecas, Mexico*

9:30 AM BREAK

10:00 AM WAM-C.6
Radiological Constituents at the Industrial Excess Landfill. *P. Charp; Centers for Disease Control*

10:15 AM WAM-C.7
Estimating "Acceptable Emergency Doses (AED)" from Submersion in Fission Product Clouds. *A. Brodsky, D.A. Raine III, M. Moshaashaee; Science Applications International Corporation, Best Medical Industries*

10:30 AM WAM-C.8
A New Tritium Model for CAP88-PC. *S-R. Peterson, G. Duckworth; Lawrence Livermore National Laboratory*

10:45 AM WAM-C.9
Radioactivity in Tobacco Leaves. *C. Papastefanou; Atomic and Nuclear Physics Laboratory, Greece*

11:00 AM Environmental Section Business Meeting

8:30 - 11:30 AM Room: CC 212B

WAM-D: AAHP Special Session: New and Changing Paradigms in Radiation Safety as We Enter the 21st Century - What Has Changed, What is Being Changed and What Needs to Be Changed - Part I

Co-Chairs: Charles Roessler and Paul Zeimer

8:30 AM WAM-D.1
Progress towards New Recommendations from ICRP. *R. H. Clarke; UK National Radiological Protection Board and Chairman, ICRP*

9:00 AM WAM-D.2
Strategic Planning Implementation at the National Council on Radiation Protection and Measurements. *M. Ryan; Charleston Southern University*

9:15 AM WAM-D.3
Proposal for a National Radioactive Materials Program. *K. A. Allen; Illinois Department of Nuclear Safety*

9:30 AM WAM-D.4
Radon in Drinking Water and Indoor Air: A Unique Approach to Risk Reduction. *A. Schmidt; U.S. Environmental Protection Agency, DC*

Wednesday

9:45 AM **BREAK**

10:15 AM **WAM-D.5**
Future Directions in Radiation Protection at EPA. *M. Boyd; U.S. Environmental Protection Agency, DC*

10:30 AM **WAM-D.6**
Hot Issues in DOE Radiation Protection Programs. *C. R. Jones; U.S. Department of Energy, DC*

10:45 AM **WAM-D.7**
HPS Governmental Relations Outreach - Evolution into the 21st Century. *K. Dinger; Health Physics Society, Congressional Liaison*

11:00 AM **WAM-D.8**
New Paradigms for Radioactive Sources. *J. Lubenau; Consultant, Lititz, Pennsylvania*

11:15 AM **Panel Discussion**

Noon **AAHP AWARDS LUNCHEON**

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

2:30 - 5:30 PM **Room: CC 230A**

WPM-A: Public Education Committee: Science Teacher Workshops

Co-Chairs: Lisa Bosworth and Karen Langley

2:30 PM **WPM-A.1**
A Historical Overview of Science Teacher Workshops and Where We are Today. *C. Plott, L. M. Bosworth; Consultant, Winston Salem, North Carolina, University of Utah*

2:45 PM **WPM-A.2**
Release of Electronic Modules Developed by the Science Teacher Workshop (STW) Committee. *I. S. Hamilton; Texas A&M University*

3:00 PM **WPM-A.3**
Addressing the Needs of Science Teachers. *TBD (Recipient of the Outstanding Science Teacher Award)*

3:15 PM **WPM-A.4**
Interactive Teaching Methods. *A. T. Harri, D. Gossen, Consultants, St. Paul, MN, Two Rivers, WI*

3:30 PM **WPM-A.5**
Steps to Coordinating a Science Teacher Workshop. *C. Tarantino; Virginia Power*

3:45 PM **BREAK**

4:15 PM **WPM-A.6**
How to Effectively Advertise your Science Teacher Workshop through the State Education Department. *M. E. McCarthy; University of Massachusetts*

4:30 PM **WPM-A.7**
Possible Sources of Funding for Science Teacher Worskhops. *L. M. Bosworth; University of Utah*

4:45 PM **WPM-A.8**
Obtaining Civil Defense Geiger Counters for Science Teacher Workshops. *K. S. Langley; University of Utah*

5:00 PM **WPM-A.9**
Hands-On Experiments for Science Teacher Workshops. *J. W. Luetzelschwab; Dickinson College*

2:30 - 5:30 PM **Room: CC 230B**

WPM-B: Special Session: Optimizing Radiation Worker Safety

Co-Chairs: Ron Cardarelli and Pete Darnell

2:30 PM **Introductory Remarks**

2:45 PM **WPM-B.1**
Strategy for Applying the Concept of Worker Safety Optimization to Protective Clothing. *R. Cardarelli; C.N. Associates, Inc.*

Wednesday

3:00 PM **WPM-B.2**
Optimization of Personnel Protective Equipment Selection at the Savannah River Site. *D. Hadlock, R. Cardarelli; Westinghouse Savannah River Company, C.N. Associates*

3:30 PM **WPM-B.3**
Consensus Based Optimization of Worker Safety at Fernald. *A. Rogers, D. Stempfly, R. Cardarelli; FERNALD, C.N. Associates, Inc.*

4:00 PM **BREAK**

4:30 PM **WPM-B.4**
Comparison of Risk Between DOE Skin Contamination Reporting Requirements and Allowable Contamination on Laundered Coveralls. *D. J. Hadlock, R. Cardarelli; Westinghouse Savannah River Company, C. N. Associates Inc.*

4:45 PM **WPM-B.5**
Radiological Occupational Health Risk Optimization for Nuclear Emergency Field Monitoring Team Workers. *M. Slobodien, R. Cardarelli; Entergy Nuclear Northeast, C. N. Associates*

5:15 PM **Summary and Closing Remarks**

2:30 - 5:30 PM **Room: CC 205B**

WPM-C: Environmental Section Session: Protecting the Environment from Radiation

Co-Chairs: Randy Morris and Ernest Antonio

2:30 PM **WPM-C.1**
Protection of the Environment from Radiation. *D. Oughton; Agricultural University of Norway*

3:00 PM **WPM-C.2**
U.S. Department of Energy Initiatives Concerning Protection of the Environment from the Effects of Ionizing Radiation: Progress, Partnerships, and Path Forward. *S. L. Domotor, H. T. Peterson, Jr., A. Wallo III; U.S. Department of Energy, DC*

3:30 PM **BREAK**

4:00 PM **WPM-C.3**
Defining the Area of Application for a Biota Dose Assessment Methodology. *R. C. Morris; Environmental Science and Research Foundation, Inc.*

4:30 PM **WPM-C.4**
An Unexpected Benefit from Performing Biota Dose Assessments. *E. J. Antonio, B. L. Tiller, T. M. Poston; Pacific Northwest National Laboratory*

4:45 PM **WPM-C.5**
Consideration of the Air Pathway in Evaluating Radiation Dose to Biota. *K. A. Higley; Oregon State University*

5:00 PM **WPM-C.6**
Development of a RESRAD-BIOTA Code for Application in Biota Dose Assessment. *C. Yu, K. A. Higley, S. L. Domotor; Argonne National Laboratory, Oregon State University, U.S. Department of Energy, DC*

2:30 - 4:30 PM **Room: CC 212B**

WPM-D: AAHP Special Session: New and Changing Paradigms in Radiation Safety as We Enter the 21st Century - What Has Changed, What is Being Changed and What Needs to Be Changed - Part II

Co-Chairs: Charles Roessler and Paul Zeimer

2:30 PM **WPM-D.1**
The HPS Standards Process and the Challenge of Interfacing into International Standards. *J. J. Fix, K. L. Swinth; Pacific Northwest National Laboratory and HPS Standards Committee, K.L. Swinth and Associates and US Overall Advisor for TC85/SC2*

2:45 PM **WPM-D.2**
New Directions in Internal Dosimetry. *M. G. Stabin; Vanderbilt University*

Wednesday

3:00 PM **WPM-D.3**
The Biological Basis of Radiation Protection Practice: Is There Anything Left to Know? *K. Mossman; Arizona State University*

3:15 PM **WPM-D.4**
New Directions in Operational Health Physics – The Nuclear Power Case. *R. L. Andersen; Nuclear Energy Institute*

3:30 PM **BREAK**

4:00 PM **WPM-D.5**
Basing Radiation Protection on Tissue-Specific Responses to Radiation. *D. J. Strom; Pacific Northwest National Laboratory*

4:15 PM **Discussion**

4:30 PM **AAHP Open Meeting**
L. F. Booth, President

5:30 - 6:30 PM **Room: CC 230A**

HPS Business Meeting

6:00 - 8:15 PM **Room: Marriott Ballroom D**

WPM-E: Aerosol Measurements

Chair: Morgan Cox

6:00 PM **WPM-E.1**
Performance Evaluation of the Eberline Alpha-7 Continuous Monitor. *M. D. Hoover, Lovelace Respiratory Research Institute*

6:15 PM **WPM-E.2**
Measuring Total Alpha Particle Energies in Ambient Air. *S. Kronenberg, G. Brucker; US Army*

6:30 PM **WPM-E.3**
Current Status of ANSI Standard N42.30-Tritium Monitoring. *P. J. Chiaro; Oak Ridge National Laboratory*

6:45 PM **WPM-E.4**
Current Status of International Electrotechnical Commission (IEC) Standards for Aerosol Monitoring. *M. Cox; Lovelace Respiratory Research Institute*

7:00 PM **WPM-E.5**
Monitoring Airborne Alpha Activity in a Highly Contaminated Environment. *G. Ceffalo, K. Funke, S. Landsman; Bechtel Hanford*

7:15 PM **WPM-E.6**
Current Status of the Revision of ANSI Standard N42.18-Specification and Performance of On-site Instrumentation for Continuously Monitoring Radioactivity in Effluents. *C. F. Wu; U.S. Department of Energy*

7:30 PM **WPM-E.7**
Characterization and Control of Airborne Beryllium in the Workplace. *M. D. Hoover; Lovelace Respiratory Research Institute*

7:45 PM **WPM-E.8**
A Technical Basis for Conducting Airflow Studies. *J. J. Whicker, J. C. Rodgers, R. C. Scripsick; Los Alamos National Laboratory*

8:00 PM **WPM-E.9**
Operational Application of Direct Analysis for Alpha Emitters in Air at a PU-239 Facility. *C. J. Bianconi; The Alpha Group and Associates, L.L.C.*

Thursday

7:15 - 8:15 AM **Room: 230A**

CEL-7 Ten Principles and Ten Commandments of Radiation Protection. *D. J. Strom; Pacific Northwest National Laboratory*

7:15 - 8:15 AM **Room: 205B**

CEL-8 Current Issues in Offsite Nuclear Power Plant Emergency Planning in Ohio. *J. M. Wills, Ohio Department of Public Safety*

8:30 - 11:30 AM **Room: CC 230A**

THAM-A: Operational Health Physics

Co-Chairs: John Miller and Gregory King

8:30 AM **THAM-A.1**

Organization of the Radiation Protection for U.S. Personnel Involved in the Highly Enriched Uranium Transparency Implementation Activities at the Ural Electrochemical Integrated Plant. *R. Radev; Lawrence Livermore National Laboratory*

8:45 AM **THAM-A.2**

Problems Associated with Contamination Control and Air Monitoring in Outdoor Environments. *J. Moxley; Westinghouse Savannah River Company*

9:00 AM **THAM-A.3**

Experiences using Level A and B Personal Protective Equipment to Remove High-Hazard Radioactive and Hazardous Constituents from a USDOE Material Storage Area. *D.D. Watson, C.E. Johnson, J.M. Hylko, J.F. Walter, C.T. Wagner; WESKEM, LLC, C.E. Johnson Consulting Services, Roy F. Weston, Inc.*

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

Theater Army Medical Laboratory Response to Simulated Depleted Uranium (DU) Contamination Scenario during Exercise Advancing Eagle. *R. A. Reyes, D. Cummings, G. A. Falo, B. J. Harvey, W. J. Bryant, J. M. Mullikin, F. Szrom, J. W. Collins; US Army Center for Health Promotion, Theater Army Medical Laboratory*

9:30 AM **THAM-A.5**

Challenges in Personnel Contamination Monitoring in the Radiological Zones in the Presences of Chronic Low Level Noble Gases and Short-Lived Daughter Products. *J. Mohindra; Pickering Nuclear Station, Canada*

9:45 AM **BREAK**

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

ALARA Experience with Moving an Intense ^{252}Cf Neutron Source. *G. Troyer, M. Higbee, O. Berglund, N. Kirner; Fluor Hanford, Inc., Kirner Consulting*

Moved to THAM-C.1A **THAM-A.7**

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

Integrating Environment Health and Safety Disciplines to Control Radiation, Chemical, and Safety Hazards Associated with a University Nuclear Reactor Pool Refurbishment Project. *D. Clum, D. Kos; DC & Associates, Ohio State University*

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

Development of a Centralized Radioactive Ordering and Delivering System: Through the Looking Glass to the Other Side. *B. Aaron, T. Mangum, T. Yoshizumi, V. Vylet; NC State University, Duke University Medical Center*

11:00 AM **THAM-A.10**

Strategies for Taking your Safety Program off Life Support. *T. L. Mays, J. B. Bunke, K. L. Classic; Mayo Clinic Rochester*

Thursday

11:15 AM **THAM-A.11**
Monitoring for Unintended Outcomes of Radiation Safety Training Programs. *A. Orders, R. Emery; The University of Texas Health Science Center at Houston*

8:30 AM - Noon **CC 230B**

THAM-B: Special Session: Stable Tritiated Compounds

Chair: David Kent

8:30 AM **THAM-B.1**
Biokinetic Behavior of Hafnium Tritide Particles Instilled into Rat Lung. *Y. Zhou, Y.-S. Cheng; Lovelace Respiratory Research Institute*

8:45 AM **THAM-B.2**
An Investigation of XRF and Bremsstrahlung Detection Concepts for Stable Tritiated Particulates. *J. Rodgers, P. Wasiolek, Y.-S. Cheng.; Los Alamos National Laboratory, Bechtel Nevada, Lovelace Respiratory Research Institute*

9:00 AM **THAM-B.3**
The Mound Special Tritiated Compound Health Physics Program. *M. Sharfi, J. T. Gill, K. A. McCartney, G. T. Rood, C. J. Miles; BWXT of Ohio, Inc., Lawrence Livermore National Laboratory,*

9:15 AM **THAM-B.4**
Detection of Stable Metal Tritide Particulates using Bremsstrahlung Radiation. *R. P. Radev, R. S. Hafner; Lawrence Livermore National Laboratory*

9:30 AM **THAM-B.5**
Airborne Tritiated Particulates: Comparison of Predictions vs Measurements. *J. Gill, G. Rood, M. Sharfi; BWXT of Ohio*

9:45 AM **BREAK**

10:15 AM **THAM-B.6**
Work Controls Associated with Stable Tritiated Compounds during Safe Shutdown Activities. *A. S. Collas; BWXT of Ohio, Inc.*

10:30 AM **THAM-B.7**
Characterization of Carbon Tritide Particles in a Tokmak Fusion Reactor. *Y.S. Cheng, Y. Zhou, C.A. Gentile, C. Skinner; Lovelace Respiratory Research Institute, Princeton Plasma Physics Laboratory*

10:45 AM **THAM-B.8**
Microdosimetry and Spectral Emissions of Metal Tritide Particles. *R. D. Stewart, D. J. Strom, J. C. McDonald; Pacific Northwest National Laboratory*

11:00 AM **Panel Discussion**
David Kent, U.S. Department of Energy, Mound

8:15 - 10:30 AM **Room: CC 205B**

THAM-C: Radionuclide NESHAPs

Co-Chairs: John Glissmeyer and Andy McFarland

8:15 AM **THAM-C.1A**
(Previously THAM-A.7) Testing of an Existing Stack Sampling Location using the Revised ANSI Standard. *M. Ballinger, J. Glissmeyer, D. Edwards; Battelle Seattle Research Center, Pacific Northwest National Laboratory*

8:30 AM **THAM-C.1**
Results of Mixing Experiments with Scale Models. *A. R. McFarland, J. A. Glissmeyer; Texas A&M University, Battelle Pacific Northwest Laboratories*

8:45 AM **THAM-C.2**
Alternate Approaches for Determining Source Terms. *B. C. Blunt; Westinghouse Savannah River Company*

Thursday

9:00 AM **THAM-C.3**
Comparison of Particle Collection in Probes and on Filters. *J. M. Eaton, M. P. Humphries, W. E. Davis; U.S. Department of Energy, TN, Oak Ridge National Laboratories, Fluor Hanford, Inc.*

9:15 AM **THAM-C.4**
Leakage in Filter Holders. *A. R. McFarland, S. Chandra; Texas A&M University*

9:30 AM **BREAK**

10:00 AM **THAM-C.5**
Compliance with ANSI 13.1-1999 in the WIPP Underground Storage Area. *A. E. Strait, N. Ramakrishna, R. Das, S. Chandra; Westinghouse Waste Isolation Division, Texas A&M University*

10:15 AM **THAM-C.6**
The Need for Qualified Air Monitoring in Legacy HEPA-Filtered Stacks. *J. C. Rodgers; Los Alamos National Laboratory*

10:30 AM **Radionuclide NESHAPs Annual Meeting**
Bill Davis, Gustavo Vazquez; Fluor Hanford, U.S. Department of Energy, DC

8:15 - 9:15 AM **Room: CC 212B**

THAM-D: Radon

Co-Chairs: David Hintenlang and Arthur Scott

8:15 AM **THAM-D.1**
A Case of Increase in ^{222}Rn Concentration in Effluent from Reservoir Fed by Well Water. *W. Abulfaraj, A. M. Mamoon; King Abdulaziz University, Saudi Arabia*

8:30 AM **THAM-D.2**
Measurements of Outdoor Radon and Thoron At Fernald, OH, New York City and New Jersey. *P. Chittaporn, N. Harley, R. Medora, R. Merrill; New York University School of Medicine, Fluor Fernald Radiation Control Section*

8:45 AM **THAM-D.3**
Outdoor Seasonal Particle Size Measurements at Fernald, OH and New Jersey. *N. Harley, P. Chittaporn, M. Heikkinen, R. Medora, R. Merrill; New York University School of Medicine, Fluor Fernald Radiation Control Section*

9:00 AM **THAM-D.4**
Building Materials as Radon Sinks. *C. Lungu; University of Minnesota*

9:15 - 11:15 AM **Room: CC 212B**

THAM-D: Radon Section Session

Co-Chairs: David Hintenlang and Arthur Scott

9:15 AM **THAM-D.5**
A Methodology for the Prediction of Long-Term Indoor Radon Concentrations. *D. Hintenlang; University of Florida*

9:30 AM **BREAK**

10:00 AM **THAM-D.6**
Regulation of Exposure to NORM in Canada. *A.Scott; Ontario Ministry of Labour, Canada*

10:15 AM **THAM-D.7**
The Proposed EPA Approach to NORM. *J. Johnson; Shepherd Miller, Inc.*

10:30 AM **THAM-D.8**
ANSI/HPS N13.53 TENORM Standard - Status Update and Activities. *J.-C. Dehmel; U.S. Nuclear Regulatory Commission, MD*

10:45 AM **Open Forum on NORM Regulation.** *Arthur Scott*

11:15 AM **Radon Section Business Meeting**

AAHP Courses

Saturday, June 9, 2001, 8:00 am-5:00 pm

Each Course is worth 16 CEC's

AAHP COURSE 1
PROJECT MANAGEMENT FOR HEALTH PHYSICISTS. ***Trisha Edgerton, California Department of Veterans Affairs***

In an age where most D & D work is performed on a contractual basis, health physicists submitting proposals must often respond to a requirement mandating the use of project management (PM) in their bid. Did you know there is an ANSI standard for project management methodology that the IEEE has also adopted? The association is the Project Management Institute (PMI) and their publication containing the ANSI standard is "A Guide to the Project Management Body of Knowledge" (PMBOK).

Many of you are using "HP Project Managers" to head up your D & D work or to oversee production of your company's products. This individual generally uses just a small portion of what the ANSI standard encompasses. In addition, a Project Plan is drawn up to satisfy the requirements of the proposal, and it is rarely looked at after the project begins. The document is all but forgotten until your customer dings you for something that you failed to do that was buried in the plan. In-house projects also drag on past due dates and there never seems to be enough bodies to get the work done.

A thorough knowledge of PM will help you develop a plan that is a living document greatly increasing the probability that you deliver a quality product within budget and on time. The use of PM is helpful in any "project", not just D & D work. Knowledge of PM is also essential for those that monitor contractors using PM methodologies.

This course will provide practical information covering PMBOK's nine knowledge areas and five management processes. This is an interactive workshop with both lecture and hands-on exercises. *Participants MUST print out the 1996 PMBOK from the PMI website and bring it to the course. The book is about 200 pages and is available via a free Adobe Acrobat download from www.pmi.org. A new edition has just come out, however, only sections of it are available for free download, so we will use the 1996 version.*

Many thanks to Steve Rima of MACTEC for assisting in the course preparation.

AAHP COURSE 2
OSHA REFRESHER TRAINING, ***Janet A. Johnson, CHP, CIH, Shepherd Miller and Judson Kenoyer, CHP, CIH, Battelle Pacific Northwest National Laboratory***

The purpose of this course is to provide eight-hour refresher training in Hazardous Waste Operations and Emergency Response in accordance with the requirements of 29 CFR 1910.120(e). A general review and update will be provided on The following topics: regulatory requirements; health and safety plans; MSDS; PPE; site control; detection and measurement; and physical, biological, chemical and ergonomic hazards. Valuable information resources, including those available on the Internet, will be identified. Students will be asked to share their own health and safety experiences and knowledge. Certificates of completion will be provided.

Professional Enrichment Program

Sunday, June 10 Through Thursday, June 14, 2001

The Professional Enrichment Program (PEP) provides a continuing education opportunity for those attending the Health Physics Society Annual Meeting. The topics for the PEP are specifically chosen to cover a broad range of subjects. Some of the sessions are popular repeats from last year and the rest are completely new lectures in response to your suggestions. 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. The class size is limited to allow for interaction between the lecturer and the students.

The speakers, course titles, and the times for each presentation are listed on the following pages. On Saturday afternoon, continuing Sunday morning an 8 hour ABET PEP will be offered. On Sunday, June 10, the day before the Annual Meeting, a series of 31 courses will be offered. The Sunday sessions begin early to allow for 4 sections that day. The program begins at 8:00 am and finishes at 6:00 pm. The Welcome Reception begins at 6:00 pm.

In addition to the above-mentioned sessions for Sunday, six PEP lectures are scheduled on Monday, Wednesday, and Thursday afternoons. Routine PEP attendees should note that the times of the mid-week sessions are 12:15 - 2:15 p.m. again this year, to be consistent with the scheduling of the Annual Meeting.

Registration for each two-hour course is $40 and is limited to 60 attendees on a first-come, first-served basis. Those whose registrations are received before the pre-registration deadline will be sent confirmation of their PEP course registration.

In order to further the Society's commitment to the next generation of Health Physicists, 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.

Continuing Education Credits from the American Academy of Health Physics have been granted for the PEP. The PEP lecture registration fees should be included with registration fees for the Annual Meeting. The PEP registration is included on the Annual Meeting Pre-registration form.

Please Note!!

Please remember to 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. We understand that there are circumstances that will prevent you from being on time, but we do not want to turn people away and have empty seats due to no-shows.

Note: Each course is two (2) hours in length and will earn four (4) continuing education credits.

Refund Policy

Requests for PEP refunds will be honored if received in writing by May 18. All refunds will be issued AFTER the meeting. Exceptions will be handled on a case by case basis.

Special ABET PEP

Marriott Ballroom D
Saturday, June 9, 1:00-5:00 PM and
Sunday, June 10, 8:00 AM-Noon
Cost: $40

R. A. Herrick, PE, CIH;
ABET Related Accreditation Commission

This is a special PEP for those seeking Accreditation Board for Engineering an Technology (ABET) accreditation for academic programs. The PEP will be a total of eight hours and prepares the attendees for accreditation application and quantification techniques appropriate for outcomes assessment under ABET. Four Continuing Education Credits will be given for the course.

The preparation for ABET accreditation starts with an understanding of the ABET process and procedures. HPS, in combination with ABET, will present a faculty workshop in Cleveland on June 9 and 10. There will be an opening four-hour session on Saturday afternoon and a continuation four-hour session on Sunday morning. This is about half the contact hours that ABET has been using for faculty workshops but we believe that a lot can be accomplished through pre-read information that will be provided to the attendees. While the workshop will have some lectures, the majority of the time will be spent working with the case studies that will be provided. The goal of the workshop is to not only develop an understanding of the ABET process among attendees but also to enable these individuals to apply the process to their programs.

Sunday, June 10 - 8:00-10:00 AM

1-A Public and Scholarly Perceptions of Radiation Risks. ***O. G. Raabe; University of California, Davis***

International recommendations, radiation protection standards, national and international policy, and radiation safety practice are all affected by both public and scholarly perceptions of the potential risks associated with human exposure to ionizing radiation. These perceptions have far-reaching impact on societal advances or impediments. This PEP lecture is a collage of the elements that compose the fabric of these perceptions concerning ionizing radiation. Among the public perceptions overlay the images presented by the media, the antinuclear activists, environmental groups, the presumed experts, the nuclear industry, and political candidates, and elected officials. Among the scholarly perceptions are the contrasting views concerning the shape or lack of shape of the dose response curve, the meaning of the linear no-threshold theory (LNT), the reality or lack of meaningfulness of beneficial radiation effects or hormesis, the underlying models of radiation carcinogenesis and genetic alterations. All of these issues will be laid out and systematically discussed. Ultimately the direction of many important societal options such as the use of nuclear power, food irradiation, scientific research goals, and expenditures of portions of our wealth for environmental restoration, that may significantly affect human welfare in the 21st Century, will depend on the course taken by public and scholarly perceptions of radiation risks.

1-B Neutron-Sensitive Scintillating Glass Fiber Sensors for Plutonium Monitoring and Analysis. ***R. S. Seymour, C. D. Hull; Nuclear Safeguards and Security Systems, LLC***

Researchers at Pacific Northwest National Laboratory (PNNL) have developed a glass fiber technology for neutron detection. Cerium-activated, lithium-silicate glass fibers respond to thermal neutrons and gamma rays and signals produced by each can be differentiated and quantified. This glass fiber technology has been refined and applied for the detection and measurement of thermal neutron and gamma ray fluxes. These commercially available detectors and detector systems are referred to as PUMA, an acronym for plutonium (Pu) Monitoring and Analysis.

PUMA detectors generally have neutron detection efficiencies that are comparable or superior to ^3He and BF_3 gas tubes, but are more robust and safer. Since bundles of neutron glass fibers are flexible, detector geometries can be optimized for specific applications, thus increasing the intrinsic efficiencies of PUMA detectors. Neutron glass fiber sensors offer large active areas, significant improvements in sensitivity *versus* costs, a wide dynamic counting range, fast response time, and lower microphonic susceptibility than conventional neutron sensors.

This PEP course provides a background and review of the basic nuclear and optical principles of neutron glass fibers. PUMA detector panels and systems will be described in detail. First principles involved in MCNP models, detection and decision limits for neutron detection, and results of empirical testing will be discussed. Various applications for PUMA hand-held neutron and gamma ray detection systems and for portal, freight, and vehicle monitoring will be presented.

1-C Preparation for Part I ABHP Certification. ***C. French; University of Massachusetts***

This course is intended for individuals who are planning to take Part I of the ABHP certification examination. A brief review will be given of techniques/methods for preparing for the examination and strategies for taking the examination. Most of the session will be devoted to discussions of questions similar to those on the ABHP examination and to consideration and discussion of specific questions from course participants. A handout will include practice questions similar to those on the ABHP examination.

1-D MARSSIM Final Status Survey Design Examples for D&D Sites. ***E. Abelquist; Oak Ridge Institute for Science and Education***

Since its publication more than 3 years ago, the MultiAgency Radiation Survey and Site Investigation Manual (MARSSIM) approach has been used at a number of D&D sites for designing final status surveys in support of decommissioning. While many of these MARSSIM applications have been relatively straightfor-

ward, some have challenged the MARSSIM user to seek solutions beyond the simple examples illustrated in the MARSSIM manual. This course will describe the nature of these challenging final status survey examples and will offer possible solutions within the MARSSIM framework.

The final status survey design discussion in this course will include several examples of how multiple radionuclide contaminants are handled for both building surfaces and land areas. The strategies for designing surveys when multiple radionuclides are present employ the use of surrogates, determination of gross activity DCGLs, and application of the unity rule. One of the most challenging MARSSIM survey design strategies arises when multiple radionuclides are present in Class 1 survey units. In this situation, the MARSSIM user must assess both the instrument scan MDC and $DCGL_{EMC}$ for the multiple radionuclides present. Two final status survey strategies for determining the need for additional soil samples in Class 1 survey units when multiple radionuclides are present will be discussed.

Additional topics in this course will include 1) the survey design and data reduction for building surface final status surveys using the Sign test, 2) survey strategies when tritium is present on building surfaces, and 3) Scenario A versus Scenario B survey designs for Th-232 in soil. The COMPASS code (MARSSIM software) will be used to illustrate the survey designs for many of these examples.

1-E Criticality Accidents: A History and Health Physics Perspective. ***D. R. Simpson; University of Nebraska – Lincoln***

The 1999 criticality accident in Tokaimura, Japan demonstrated that criticality accidents can happen in unexpected circumstances; and can involve workers, emergency response personnel, hospital care providers and others who are unfamiliar with necessary safety precautions. Also health physicists from nearby facilities or agencies may find themselves called upon to assist in the response to such events, even if their routine assignments do not involve the potential for criticality accidents. This lecture is designed for health physicists who do not have an extensive background in criticality safety, but who have an interest in criticality accidents and/or who might become involved, directly or indirectly in the response to a criticality accident.

An overview of the basics of criticality will be provided, including the fundamentals of criticality safety, how a criticality accident can occur, what the likely health physics consequences are, and what actions may be needed to recover from a criticality accident and assist the accident victims. The majority of the time will be spent reviewing several previous criticality accidents, and examining the health physics issues that arose from them. Factors involved in these accidents, such as dosimetry methods, dose relationships with distance, visual and other physical indications of a criticality, immediate and long-term treatment of victims, and considerations for reentry and recovery from the accident will be discussed. The lessons that were learned from these events, as well as some lessons that were not initially learned, will also be reviewed.

1-F Back to Nature: The Geological Origins of NORM. ***P. A. Karam; University of Rochester***

We all know that NORM is Naturally Occuring Radioactive Materials. What is not as well-known is where in nature NORM originates. Some mineral deposits are rich in NORM isotopes while others are not, and processing NORM-enriched rocks and minerals can lead to subsequent regulatory concerns.

This PEP will review the sources of NORM in the environment, paying special attention to those sources that are commercially important or that have the potential to affect radiation dose to workers or nearby residents. We will also go over some case studies involving NORM-contaminated sites and will perform some basic calculations involving exposure to workers at facilities with NORM considerations.

1-G (Formerly 2-G) Basic Laser Safety. ***T. Johnson; USUHS/PMB***

This course will review the basics on hazards due to VIS and IR lasers for persons who have little or no prior laser experience. Laser operation and construction will be discussed without the use of complex equations. A non-technical discussion of the biology of the skin and eye and how they are affected by lasers is included.

Laser terminology and laser classifications will be explained. This presentation requires only a knowledge of simple algebra and an interest in lasers. No prior knowledge of lasers or their operation is assumed. Upon completion of the class the student should be able to successfully complete the laser calculation PEP also offered by this instructor.

Sunday, June 10 - 10:30 AM-12:30 PM

2-A Shielding for Radiation Therapy Facilities. ***K. R. Kase; Stanford Linear Accelerator Center***

This course is designed to remind health physicists of the principles of exponential attenuation of photon and neutron radiation and its application to radiation shielding. Beyond that it introduces some new information that is important to shielding design that has been developed over the past ten years. This includes information of photon and neutron scattering in entrance mazes, the effect of neutron capture gamma rays on shielding of doors, the use of laminated concrete and metal barriers, attenuation characteristics of prefabricated high density concrete and special considerations related to new therapy techniques such as intensity modulated radiation therapy.

Following an introduction that covers the essentials of exponential attenuation, shielding methods, materials and structures will be discussed. Special considerations needed for shielding neutrons will be detailed and the design of entry mazes, ventilation ducting and other shield wall penetrations will be thoroughly covered. Several example calculations of barrier thickness will be illustrated to emphasize considerations related to radiation beam energy, shielding materials and barrier design. Similarly, examples of entry maze designs will be analyzed to illustrate radiation transport and shielding door requirements. Uncertainties in the design of shielding are related to knowledge of source terms and attenuation of x-ray and neutron radiations covering a broad range of energies. These uncertainties will be discussed in conjunction with the calculations of transmission of radiation through barriers and entry mazes.

The student should expect to benefit from this course by gaining an understanding of the considerations needed for designing shielding for modern radiation therapy accelerators, approaches that can be used in the barrier and entry design, the uncertainties in the calculations of barrier thickness, and where to look for information to help with the design process.

2-B Calculating and Reporting Fetal Radiation Exposure from Diagnostic Medical Procedures. ***P. A. Karam; University of Rochester***

Pregnant women sometimes receive diagnostic medical procedures involving radiation or radioactivity. In such cases, medical health physicists should be called upon to calculate a fetal radiation dose and to report this to the woman's physicians. However, dose information alone is not sufficient because many physicians are unfamiliar with the fetal effects of ionizing radiation. It is essential to present supporting information to the woman's obstetrician so both doctor and patient can make a reasonable decision based on facts and not on fears.

This PEP will review factors affecting fetal radiation exposure, the current medical guidelines regarding the effects of varying levels of exposure, and reporting this information. Some sample calculations will also be provided for radiation exposure via x-ray, CT, fluoroscopy, and diagnostic nuclear medicine procedures.

2-C Nuclear Waste Management. ***C. F. Wu; DOE Carlsbad Field Office***

The United Stated, as well as other industrialized countries, had long realized that proper management of the back-end of the nuclear energy cycle is important and challenging. The U.S. federal government, states, and the industry have made significant efforts in identifying nuclear waste characterization, handling, storage, transportation and disposal options that are socially, economically and politically acceptable. Regulations governing waste management activities have been carefully established and are continuously being improved upon. The Nuclear Waste Policy Act of 1982 (and as amended in 1987) assigned the U.S. Department of Energy the responsibility of spent nuclear fuel, high-level, and transuranic (TRU) wastes disposal. Individual states are responsible for managing low-level radioactive wastes, while any state may join force with other states to establish a compact disposal fa-

cility. This course describes the regulatory framework of waste management. It also provides an overview of the licensing experience and the current status of the world's only operating deep geologic repository for TRU waste, the Waste Isolation Pilot Plant (WIPP). In addition, it discusses the progress at the candidate repository for spent fuel and high-level wastes, the Yucca Mountain Project; and low-level waste disposal sites.

2-D Useful Tricks and Applications with Microshield and MCNP. ***R. Hayes; Westinghouse TRU Solutions, WIPP Project***

In this presentation, some new uses and applications of shielding software are presented. The first topic will be the use of Microshield to correctly model exposure from layered materials of differing Z with some comparisons to traditional and more advanced methods (MCNP) provided. This will be followed by a discussion of the limitations and scope of various applications for Microshield. This will take place in the form of reviewing the various functional facets of Microshield and how these can be used and exploited to the advantage of the user. The software in general will be reviewed followed by some simple examples of its use where Microshield can clearly be considered a more advantageous application for use than MCNP. A brief review of some recent literature will also be presented to illustrate certain examples of these Microshield features. Also, simplifying models of the MicroShield results, with basic verification benchmark calculations using MCNP, are presented. An overview of the MCNP4C software package will be offered and a thorough discussion of its limitations, advantages and import will be discussed from a routine shielding application. Examples of how shielding software technology has been used and applied in some new and innovative ways at the WIPP is given in conclusion.

2-E Health Physics and Nuclear Technology Update. ***K. Kasper; SCIENTECH, Inc.***

Ken Kasper, Associate Editor of the Health Physics Journal and author of the Journal's "Technology Monitor" column, will present attendees with information about recent technological developments within the health physics and nuclear communities. Topics will include a brief review of technologies featured in the "Technology Monitor" column including new dosimetry; new portable instrumentation and measurement processes; new decontamination and dismantlement technologies, and more! The results of INEEL's decontamination process testing and the latest in nuclear power plant design will also be discussed. We will also discuss how technology affects the implementation of the MARSSIM process and will review the latest dose assessment computer codes. Come see what's new in your profession!

2-F Radioactive Materials Transportation Part I. ***S. M. Austin; CSI-Radiation Safety Academy*** **(Two Part Course)**

This session is Part I of a two-part series. This session will review Nuclear Regulatory Commission and Department of Transportation regulations concerning the transportation of radioactive materials. During this first part we will review DOT and NRC requirements for training of HAZMAT employees, classification of hazardous materials, DOT and NRC exemptions, normal form and special form radioactive materials, limited quantities of materials and articles and instruments, low-specific activity shipments (LSA-I, LSA-II, LSA-III), and surface contaminated objects (SCO-I and SCO-II). We will review requirements for radioactive material packagings, design requirements for Type A packages, and labeling of radioactive material packages.

2-G (Formerly 1-G) Laser Safety Calculations Using the New ANSI Z136.1. ***T. Johnson; USUHS/PMB***

This course will review the basics on calculating the hazards due to VIS and IR lasers for persons who have some prior laser calculation experience. The required equations and terms used are presented, but those with some knowledge of laser basics will benefit most. After presenting the terminology, an explanation on how to use the equations, as well as detailed examples of calculations of computing NOHD as well as OD for safety glasses will be presented. The class will use ANSI Z136.1 as a reference for all of the calculations. An ordinary calculator capable of performing square roots and exponentials (such as t^0.75) should be brought by each student so that they may follow along. The calcula-

tions in this presentation require only a knowledge of simple algebra and basic laser knowledge.

Sunday, June 10 - 1:30-3:30 PM

3-A Characterization of Radioactive Airborne Particles. ***O. G. Raabe; University of California, Davis***

Occupational and environmental exposure to radioactive airborne particles is often the most important route of exposure of people to ionizing radiation. The inhalation of airborne particles is a key route of entry of radionuclides into the human body. It also represents a relatively complicated process that depends on the particle size distribution of the airborne particles, their dynamical behavior in air, and the physical and chemical properties of the particles that control the radionuclide biokinetics after deposition in the respiratory tract. Inhalable airborne particles are primarily those consisting of particles smaller than 10 micrometers (μm) in aerodynamic equivalent diameter. If inhaled, radioactive particles may be deposited by contact upon the various surfaces of the respiratory tract. Because of the high permeability of the lung and the copious blood flow, relatively soluble materials depositing in the lung can readily enter the blood and be transported to other organs throughout the body, while other less soluble particles can directly irradiate the airway epithelium and lung parenchymal tissues for many years. In addition, a portion of the inhaled deposited particles is swallowed and passes through the gastrointestinal tract where additional systemic intake is possible. This PEP lecture reviews the physical properties of airborne particles that affect inhalation deposition, their dynamical properties in air, the properties that affect their solubility in the lung, and the principal methods used to sample and characterize airborne radioactive particles.

3-B Origins and Distributions of NORM and TENORM. ***C. Hull, P. Egidi; University of Nevada – Las Vegas, Oak Ridge National Laboratory***

NORM (Naturally Occurring Radioactive Material) is disseminated throughout the planet and atmosphere. TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) is comprised of naturally occurring radionuclides, but specific activities of some radioelements are elevated in TENORM-bearing materials. This is because some industrial or chemical processing of bulk materials redistributes NORM and may concentrate ^{238}U and ^{232}Th decay chain nuclides in certain fractions of processing streams.

TENORM is prevalent in industrial societies and is becoming more common throughout the world as a variety of products such as chemical fertilizers; some petroleum products, mine tailings; rare earth and zircon sands; metals produced from certain types of ores, *etc.* are processed and re-distributed. TENORM is not only distributed in products, but is also contained in many by-products of manufacturing and chemical processing. TENORM may be significantly elevated in areas that are used to stockpile some manufacturing by-products.

3-C Developing and Applying Radionuclide Distribution Coefficients (K*d* values). ***W. H. Johnson; University of Nevada - Las Vegas***

In order to assess the public health risk associated with the behavior of radionuclides in the environment, knowledge of the partitioning of each radionuclide between different phases is required. This requires information on the basic physicochemical properties of the radionuclide, soil/mineral surfaces, colloids/particulates and dissolved complexes. A distribution coefficient (K*d* value) describes the partitioning of a radionuclide between the solid and aqueous phase of a system and ultimately provides an estimate of radionuclide's transport velocity via the groundwater pathway.

This seminar will address the applications of distribution coefficients in contaminant transport modeling, and detail the methods of determining site-specific values. The uncertainties associated with traditional distribution coefficients and the geochemical processes and parameters causing distribution coefficients to vary will be discussed. How, and from where, to choose an appropriate value for use in screening calculations or risk assessments of a site will be outlined. Case studies using recently developed or novel techniques for determining distribution coefficients in both a laboratory setting and by the in-situ batch method will be examined. Emphasis will be placed on isotopes of the ele-

ments cadmium, cesium, strontium, plutonium and uranium.

3-D Beta Dosimetry and Personnel Contamination Monitoring. *G. T. Mei; Oak Ridge National Laboratory*

Beta particles can sometimes contribute significantly to the skin dose in personnel contamination. However, personnel monitoring for beta contamination has played a minor role in radiation protection mainly due to the inherently more difficult measurement techniques it requires in comparison with photon monitoring. Field measurement of beta contamination is complicated by difficulties in instrument calibrations, the presence of low-energy photons and the lack of adequate training and procedures.

The lecturer will review the basic principles of beta dosimetry and consider the challenges facing health physicists who provide beta dosimetry and/or contamination monitoring in the radiological workplace. Regulations and guidelines on radioactive surface contamination limits will be discussed. The technical basis for the method of manual frisking will be presented. On the practical side, the estimation of beta skin dose with a portable instrument will be illustrated. The relationship of the portable instrument's output to an equivalent skin contamination level and the dose distribution will be discussed. Exercises with skin dose calculations will be presented in the class.

In addition, drawing upon her own experience in beta dosimetry, the lecturer will present an evaluation of selected portable instruments for low-energy beta contamination monitoring based on detector response, detection sensitivities, and general performance characteristics. The lecturer will also discuss Monte Carlo calculations for beta dosimetry.

3-E Application of In-Situ Gamma Spectroscopy in Operational Health Physics and Mathematical Calibration of Ge Detectors. *F. Bronson; Canberra Industries*

With today's modern equipment [portable Ge detectors, small digital MCAs, powerful PCs] laboratory-quality gamma spectroscopy is now very convenient for use in the field. And with the new and accurate mathematical calibration software that is available today, these gamma spectra are now fully quantitative analyses. The lecture will describe how these completely source-less calibrations are done, how they have been validated, and how accurate they are. A variety of applications that have been performed by InSitu gamma spectroscopy will be presented and discussed. These include waste assay of large containers [trucks], free-release surveys of large and complex objects, underwater spectroscopy, locating hidden or buried sources, activity-vs.-depth determinations, emergency response measurements, in-vivo bioassay, etc. The advantages of large-sample InSitu assay will be presented as compared to the traditional small-sample lab-assay technique.

This same source-less calibration technology has recently been expanded to the counting laboratory Ge detector. Examples of calibrations of laboratory detectors will be shown, along with the accuracy testing results. Uses of this calibration technology to save time/money in the counting laboratory by optimizing the detector and/or sample size, and infinite geometry laboratory counting will be presented.

Examples presented will be from users with the Canberra ISOCS system and the LabSOCS software, although these techniques are equally applicable with other calibration and measurement methods.

3-F Radioactive Materials Transportation Part 2. *S. M. Austin; CSI-Radiation Safety Academy*

This session is Part 2 of a two-part series. This session will continue the review Nuclear Regulatory Commission and Department of Transportation regulations concerning the transportation of radioactive materials begun in the previous PEP session. This session will review DOT requirements for marking packages, placarding vehicles, and shipping paper requirements. There will be a review of hazardous material descriptions applicable to radioactive material shipments, emergency response requirements, special requirements for different modes of conveyance. There will be a discussion of U.S. Postal Service requirements for shipment of radioactive materials via U.S. mail. NREC requirements for the receipt and inspection of radioactive materials will be reviewed.

3-G Environmental Health Physics, Final Status Survey. *R. Leuenberger; Earthline Technologies*

Final Status surveys are evolving to encompass changing regulatory requirements (i.e., NRC, EPA Superfund, and Agreement State). Dose to risk modeling (e.g., RESRAD) provides the bridge between risk (i.e., dose) and Derived Concentration Guideline Levels DCGLs) used for a Final Status survey. MARSSIM in turn provides acceptable statistical modeling necessary to design and evaluate the results of a Final Status survey.

The Final Status survey process begins with acceptable risk (e.g., 25 mr/yr for NRC Licensees). Then DCGLs are modeled from the radionuclides present and site specific parameters. If the clean-up involves Naturally Occurring Radioactive Material (NORM), then Agreement State requirements may apply. The final survey is performed and statistical modeling (i.e., measurements of central tendency) compare the median radionuclide concentrations to the DCCLs.

3-H An Introduction to Radiation Litigation. *K. Komer; Jose & Wiedis*

This course begins with a discussion of basic legal concepts which are fundamental to understanding radiation litigation. Among the topics covered are the Price Anderson Amendments Act, historic developments of radiation injury cases, how lawyers investigate a radiation case, how the case proceeds from the incident through the discovery process, preparation for trial, the trial itself, and Plaintiff and Defendant's strategies used during trial. Major issues currently being litigated are: what is the standard of care required of a utility, the role of the federal dose standards, the role of ALARA, the role of dosimetry, the impact of new part 20 on radiation litigation, what constitutes compensable injury, what is adequate proof of causation, and the role of the linear no threshold hypothesis. Practical examples from cases will include strategies developed for deposition and trial.

3-I Medical Consequences of the Chernobyl Accident: t+15y. *G. J. Vargo; Pacific Northwest National Laboratory*

The medical and public health effects of the April 1986 Chornobyl accident have been the subject of wild and sometimes absurd claims. This presentation reviews the accident, its radiological consequences, and known medical effects including acute effects, thyroid cancer, leukemia, and teratogenesis. The difference between projected and observed health effects may have significant implications for human health risk estimates. Results of the UNSCEAR-2000 report are included.

Note: Dr. Vargo is the editor of the recently published book "*The Chernobyl Accident – A Comprehensive Risk Assessment,*" Battelle Press, 2000.

Sunday, June 10 - 4:00-6:00 PM

4-A Air Scattering of Radiation and Skyshine. *N. E. Hertel; Georgia Institute of Technology*

A historical review of the importance of radiation scattering by air and, in particular, radiation skyshine problems and analyses will be presented. Methodologies, both present and past, for computing dose rates for such radiation transport problems will be discussed. The methodologies covered will extend from empirical approaches to the solution to the use of detailed radiation transport calculations. The impact of the air-ground interface will be addressed and ways to correct the results for simplified methods for this effect. Examples of air-scattering and skyshine problems will be presented with special attention given to current shielding problems in which the dose rates are driven by air-scattered radiation such as the location of the exclusion boundary for interim spent fuel storage installations.

4-B Regulatory Initiatives for Control, Release, and Disposal of TENORM. *P. V. Egidi, Colorado Department of Public Health & Environment*

Regulatory agencies are taking a variety of approaches to address protection of workers, members of the public, and the environment from practices generating technologically-enhanced naturally occurring radioactive material (TENORM) that can lead to increased exposures. Industry is concerned about increased costs and regulatory burden arising from regulating TENORM. Federal agencies (EPA and NRC) are now re-visiting their former positions with respect to TENORM, and are considering regulat-

ing some aspects of TENORM. States are the most experienced with addressing the myriad of situations in which TENORM can arise. This session will include:

- A brief overview of industries that have been identified with TENORM contamination and with estimated volumes and concentrations of TENORM generated by these industries.
- The recommendations of the International Commission on Radiation Protection (ICRP), International Atomic Energy Association (IAEA) Safety Series and European Commission (EC) proposals, Draft Canadian Guidelines For The Management of Naturally Occurring Radioactive Materials,
- A review of positions/efforts of the Environmental Protection Agency, Nuclear Regulatory Commission, National Council on Radiation Protection and Measurements, the National Research Council,
- The Conference of Radiation Control Program Directors' (CRCPD) suggested State regulations for control and release of TENORM (Part N),
- Current draft of the basis for proposed standards by the American National Standards Institute (ANSI)/Health Physics Society Working Group (N13.53) on TENORM,
- Release and disposal options for TENORM wastes in the United States.

4-C Health Physics Applications of Mathcad. ***T. LaBone; Westinghouse Savannah River Company***

Mathcad is a popular software package that works like a word processor/equation editor that actually solves the equations you enter. This class will begin with a brief introduction to the Mathcad interface, its syntax, and basic capabilities. We will then move on to more complex problems including:

- Solutions to systems of differential equations.
- Numerical integration of functions.
- Linear and non-linear least squares fits to data.
- Simulations using random numbers.
- Calculations with normal, log-normal, and Poisson distributions.
- Linear and logarithmic interpolations.
- Calculations with calendar dates.

The sample problems used in the class will have a definite internal dosimetry/bioassay slant, but the techniques are applicable to a wide variety of health physics calculations. Although some of the mathematical concepts discussed may be somewhat advanced, the class is appropriate for health physicists who have a need to perform computations and may have outgrown the capabilities of their favorite spreadsheet.

4-D Workplace Air Monitoring. ***J. L. Alvarez; Auxier & Associates, Inc.***

Air monitoring is real-time, alarmed air sampling. The air sample is analyzed as the air is sampled. The delay between the time of collection and analysis or the time needed to collect sufficient sample and analysis should be small compared to the time a worker would be exposed. The exposure time is small if the dose received is at or below a targeted CEDE for an intake.

The course will discuss the role of air monitoring in a protection program and the problems encountered. Solutions to those problems will be presented along with an alarm strategy and alarm response methodology. The solutions will include air sampler placement and room airflow patterns.

The course will provide sufficient information to analyze an air monitoring program, to define and document the level of protection it provides, to design an appropriate airborne protection program, and to develop an alarm response methodolgy.

4-E Introduction to Monte Carlo & the MCNP Code. ***R. H. Olsher; Los Alamos National Laboratory***

Monte Carlo type calculations are ideally suited to solving a variety of problems in radiation protection and dosimetry. The Los Alamos MCNP™ code is a general and powerful Monte Carlo transport code for photons, neutrons, and electrons, and can be safely described as the "industry standard" with more than 600 person-years of development effort behind it. The code is supported on a variety of platforms including desktop and laptop personal computers. This lecture is aimed at introducing the basic concepts of the Monte Carlo Method and providing an overview of the MCNP code. Topics include code capabilities, source term definition, and fluence and dose calculations.

A discussion of health physics applications in the areas of radiation shielding and dosimetry will also be provided, to include skyshine and detector simulations.

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4-F Neutron Dosimetry. *K. W. Crase; Westinghouse Savannah River Company*

This course will review the basic methods by which neutrons contribute to radiation dose, and the techniques available to both detect neutrons and estimate the resultant dose to humans. A brief history of neutron dosimetric techniques will be provided, and considerable attention paid to the current materials and methods used to assess neutron dose. Particular emphasis will be placed on the strengths and weaknesses of specific types of neutron dosimeters, and the importance of matching the neutron fields available with the most appropriate selection of dosimeter type(s). Knowledge of the neutron energy spectrum and the energy response function of various neutron dosimeters will also be discussed.

4-G We Are Not Cops, the Science and Art of Performing Audits. *E. Hochheiser; University of Arizona*

Auditing laboratories is one of the best methods for developing and maintaining an effective working relationship with the researchers. Audits are conducted to insure regulatory compliance, but focusing on regulatory compliance is missing an important opportunity. The audit program increases your knowledge of what is going on in all of the laboratories, not just the ones that may have problems. At a university, audits are an important mechanism for observing the safe uses of radioactive material, radiation producing machines and lasers. It is also an opportunity to train and educate our varied population to demonstrate support and especially to enhance and improve our mutual communication with them. At the same time it is important that we work with our researchers, each with their own unique methods of using radioactive material.

This PEP will discuss when, how and what needs to be included in an effective audit program at large research university.

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4-H The Problem of "Junk Science" in Radiation Litigation. *K. Komer; Jose & Wiedis*

The problem of "junk science," the United States Supreme Court's recent *Daubert* decision, and a case study using the latest decisions on expert testimony will be examined. This session includes examination of radiation experts retained by Plaintiffs in several of our most recent radiation cases.

Monday, June 11 - 12:15-2:15 PM

M-1 Effective Use of the MIRD System for Medical Internal Dose Calculations. *D. R. Fisher; Pacific Northwest National Laboratory*

Medical internal radiation dosimetry (MIRD) is not difficult with simple computer programs or dose conversion factors. However, the real key to effective use of the MIRD system is to understand how it works. This means that we need to know the fundamental assumptions and the essential data input requirements. The fundamental input data are acquired from medical imaging. Image interpretation involves 1) collecting data to determine the source-organ activities, 2) plotting the source-organ time-activity curves, 3) integrating the time activity curves for an estimate of the MIRD residence time, and 4) applying the residence time values for each important source organ within the MIRD system to

calculate the tissue absorbed dose to target organs and tumors of interest. This course will also describe sampling times, area-under-curve integrating techniques, and customizing a dose assessment for a patient who doesn't resemble the MIRD phantom. Sample dose assessments will be presented, together with common mistakes to avoid. With the increased use of radiopharmaceuticals for cancer therapy, this course is essential for persons who desire better understanding of medical internal dose for treatment planning and follow-up evaluations.

M-2 Safety and Health Management for Decontamination and Demolition Operations. *J. Tarpinian; Bechtel Hanford, Inc.*

This PEP lecture explores pragmatic aspects of implementing safety, health, and radiological controls programs for decontamination and demolition (D&D) operations. Safety and health management of D&D operations is fundamentally complex: (1) the worksite hazards may be partly or wholly uncharacterized before work begins, (2) the work site is dynamic with rapidly changing conditions, (3) there are multiple hazards that exist simultaneously, and (4) the inherent nature of D&D operations serves to reveal or exacerbate the hazards as a consequence of progress. Meeting these unique challenges requires workers and managers to be creative and flexible and to work together to optimize protection and production. This class explores the challenges presented by D&D operations, defines and discusses concepts and applications of an integrated safety management system, and introduces the "Safety Leadership Leverage Model" for use by safety and health professionals and managers. The lecture draws from actual experience and is appropriate for anyone involved or interested in D&D operations or those who want to learn more about safety and health management. Time permitting, and if the spirit moves him, The Reverend Jim will give his "Born Again Safety Leader" sermon.

M-3 The History of Release Criteria: From *de minimis* to BRC, to Clearance. *W. E. Kennedy, Jr.; D. Moeller & Associates, Inc.*

Over the past forty years, attempts have been made by several organizations to develop and define a lower level for radiation protection dealing with trace amounts of either surface or bulk radioactive contamination. Release criteria are important both in terms of metal recycle from nuclear facilities, and for establishing general criteria for the release of materials from radiological control. Early attempts included those of the Atomic Energy Commission (AEC) to develop Regulatory Guide 1.86 and the early efforts of the Health Physics Society, with the American National Standards Institute (ANSI) to develop early drafts of ANSI Standard N13.12. On the international front, early efforts included those of the International Atomic Energy Agency (IAEA) to develop *de minimis* concentrations, first for ocean disposal, then later for disposal of material to municipal landfills. More recent efforts include the U.S. Nuclear Regulatory Commission's attempts to develop a "Below Regulatory Concern" policy, the IAEA's program on Clearance, and the final ANSI Standard N13.12 on "Surface and Volume Radioactivity Standards for Clearance." The purpose of this course is to provide an historical overview of the evolution of release criteria, both in the United States and abroad, as applied to surface and volume radioactive contamination.

M-4 Radon Measurement and Mitigation – A Satisfying and Lucrative Ancillary Service for Health Physicists. *P. Kotrappa; Rad Elec Inc.*

Radon is a radioactive gas. It comes from the natural decay of uranium that is found in nearly all soils. Radon typically moves through the ground to the air above and into your home through cracks and other holes in the foundation. Home traps radon inside, where it can build up to elevated levels far exceeding what is found in the ambient environment. This is mainly because of airtight nature of modern homes. Such elevated levels of radon are termed as "technologically enhanced radon" and the levels exceeding ambient levels are considered man made. It is hard to believe that there are large numbers of homes with radon levels in excess of the levels permitted in uranium mines! Radon is known to cause lung cancer in humans and is termed as class A carcinogen. Scientific Advisory Committee of USEPA has estimated that nearly 20,000 lung cancer deaths per year, are attributable to indoor radon exposure and it is next only to smok-

ing as a causative agent of lung cancer. Health Physicists have a mission to minimize exposure to ionizing radiation and it is most rewarding if the mission is expanded to detecting and mitigating elevated levels and avert preventable lung cancer deaths due to ionizing radiation from inhaled radon. The presentation includes: Occurrences of elevated levels, Biological effects, Significance as indoor air pollutant, Detection methods and protocols, Mitigation methods, Review of EPA publications, Certification processes for radon measurement and mitigation service providers, and Viewing of associated video tapes.

M-5 Key Health Physics Principles Applied in the Design of a Major Radon Control System. ***K. J. Eger, J. B. Martin, K. D. Rickett, R. D. Daniels; Foster Wheeler Environmental Corporation, Battelle Pacific Northwest National Laboratory, Fluor Fernald***

The removal of radium bearing waste from two large concrete silos to more secure storage is complicated by the presence of high concentrations of radon, i.e., 15,000,000 pCi/L, in the headspaces above the waste. Dose rates on the surfaces of the silos range from 50 to 100 mrem/hr due mostly to the short lived daughters associated with the radon in the headspace. To work effectively on the project it is necessary to reduce this dose rate by removing the radon – while still protecting the neighboring workers and the public.

The radon control system (RCS) designed to do this works by pulling air from the silos, cooling and drying it, and passing it through large carbon beds. The beds serve to delay the passage of radon for up to two months. By that time most of it has decayed. The air exiting the beds contains only a few percent of the original radon and is either recycled, or discharged through a 150-foot stack.

This session addresses the key health physics principles applied during the design of the RCS, equilibrium relationships, ingrowth, carbon absorption, overall system performance, distribution of radon in the carbon beds, shielding, discharge, and stack monitoring.

The RCS has been designed, and construction is underway. The operation of the system, scheduled to begin near the end of this year, will provide a wealth of experience - allowing us to make a pointed comparison between the principles used and the real-life system performance.

M-6 Radiation Dosimetry Management: Dosimeter Characteristics, Quality Assurance, and Investigations. ***S. Perle; ICN Dosimetry Division***

In a litigation-prone society, it is prudent for any business to evaluate its potential exposure to legal action, initiated by either an employee or a member of the general public. This potential is exacerbated when the phobia of radiation exposure and radioactive materials is interjected into the equation. This phobia is fuelled by the perceived risks of radiation exposure, be they fact or fantasy. With the current cancer incidence rate being approximately 1 in every 2.5 individuals (for all types of cancer), it is imperative that all facilities take a proactive look at their business vulnerability.

When radiation exposure is the issue, records documentation is a critical factor, and a significant amount of effort should be expended to implement a comprehensive records management system. A comprehensive Radiation Dosimetry Management Program is essential if a business is going to mitigate any regulatory or legal intervention.

This PEP session will focus on the basic configuration of various types of dosimeters, i.e., TLD, film ,CR39, high dose dosimetry and criticality accident dosimetry, and the appropriate applications for which each should be selected for personnel use. Also addressed will be the appropriate Quality Assurance activities focused for each type of dosimeter, and, the appropriate requirements for investigations of dosimetry results.

Wednesday, June 13 12:15-2:15 PM

W-1 The Role of the Health Physicist in Accident Management. ***R. E. Toohey; REAC/TS***

As an emergency response asset of the Department of Energy, the Radiation Emergency Assistance Center/Training Site (REAC/TS) is charged with providing support, advice, and training on the medical management of radiation accident victims. When a radiation accident occurs, close coordination is required between medical and health physics personnel;

however, unless extraction of a victim from a very high radiation field is required, medical care always takes priority over radiological considerations. Health physicists must be familiar not only with the application of radiation protection principles to accident management, but also with medical terminology and procedures, and both on-scene and in-hospital emergency medical care. Challenges include interaction with medical personnel, dose assessment, public information, and post-accident interactions with managers and investigators, and possibly attorneys. Medical personnel must be taught basic radiological terminology, the difference between irradiation and contamination, radiological triage, contamination control procedures during evacuation and treatment, methods for patient decontamination, possible therapies (e.g., administration of DTPA), waste management, and preservation of evidence. Dose estimation includes radionuclide identification; intake estimation; deep, shallow and lens dose measurement or estimation; accident reconstruction; and use of opportunistic dosimeters and/or biological dosimetry. Public information concerns include patient privacy, release of facts vs. assumptions, determinations of the effectiveness of plans and procedures, and transmitting technical information to a lay audience. Post-accident interactions include refinements or revisions of dose estimates, stochastic risk estimates, review of operations, review of emergency plans and procedures, and development of lessons learned, as well as potential involvement in litigation. Some actual experiences in radiation accident management will be used to illustrate these points.

W-2 Accelerator Radiation Safety. ***V. Vylet; OESO/DUMC***

The purpose of this course is to examine general aspects of a radiation safety program at an accelerator facility. The topics described include: characterization of radiation hazards and implications for facility design, principles of safety system design and implementation, radiation monitoring and instrumentation, operational and administrative aspects. Since the scope of a particular program will greatly depend on the type and size of a facility, we will illustrate the above aspects with examples from several existing accelerator installations. The course will include a brief overview of available guidance documents and recommended literature.

W-3 Mutations and Time. ***P. A. Karam; University of Rochester***

Our environment contains a great number of agents that can damage our DNA. Levels of free oxygen, UV, ionizing radiation, even the style of metabolism have changed considerably over the history of life on earth, and many of these changes can be evaluated in a reasonably accurate manner. In turn, the manner in which the "style" of damage has changed may have an effect on the way modern organisms respond to DNA damage today.

The PEP will draw on (and extend) presentations from previous HPS meetings to discuss not just radiogenic rates of DNA damage over time, but rates of DNA damage from all major sources over the last four billion years.

W-4 Risk Perception in General and the Debate over Nuclear Power. ***N. Robbins, B. Stephany; Case Western Reserve University***

The public's fear of nuclear power and the frustration of honest nuclear power proponents are based both on factual issues and also on different perceptions of risk. In order to illustrate the more general issues of risk perception, we chose the following format:

1. A 20-minute unrehearsed debate between two sincere, honest individuals who take radically different positions on nuclear issues (Bill Stephany, and another person, TBA);
2. A 40-minute interactive discussion of the field of Risk Perception by Dr. Norman Robbins, using elements of the preceeding debate as illustrative of the clash of different perceptions; and
3. A 60-minute discussion, facilitated by Dr. Robbins, focusing on the issue of risk perception, with the debaters and the audience sharing their ideas and reflections.

W-5 Quantities and Units for Radiation Protection. ***D. J. Strom; Risk Analysis & Health Protection, Pacific Northwest National Laboratory***

Abstract. This course presents a comprehensive review of SI quantities, units, and prefixes, and correct style and presentation as agreed to in international standards. Difficulties caused by conversions from one unit system to another are pre-

sented, including double-valued standards. The imprecise notion of *error* is disaggregated into the concepts of quantity variability, measurement uncertainty, model uncertainty, and blunders (true "errors"). The notion of significant figures as a *required* method of expressing one's degree of knowledge about a quantity is debunked. Building on this foundation, the presentation turns to a comprehensive and critical review of radiation quantities and units, including those from various regulatory agencies, ICRU Publications 40 (1986), 51 (1993), and 60 (1998); ICRP Publication 60 (1991), 65 (1993) and 74 (1996), as well as BIPM, ISO and NIST references. Use of jargon is flagged throughout. Web links are provided, along with a handout, a dose of humor, and some speculation about what radiation quantities and units would be like in a more perfect world.

W-6 Health Effects and Effective Radiation Protection. ***C. L. Greenstock; AECL***

Exposure to ionizing radiation can result in a variety of biological effects including cancer and cell death. These effects are dependent upon the nature of the radiation and the overall biological response, particularly DNA repair, apoptosis and antioxidant defence processes. The results of acute vs chronic exposure, effects of dose, dose-fractionation, dose-rate and radiation quality, will be described. Data from such experiments and A-bomb survivors provide the foundation for new regulations and dose limits based on ICRP 60.

The lecture will give an historical perspective, and provide the audience with basic principles and concepts. The talk will describe the interaction of radiation with biological targets, mechanistic insight into radiation damage, and details of those factors that influence the biological consequences. These include the radio- biological oxygen effect, split-dose recovery and DNA damage control, triggered low-dose stimulation and the adaptive response, cell signalling and bystander effects, genetic instability and gene induction.

In bio-monitoring of unplanned events or emergencies, it is important to distinguish between radiation dose and biological risk. This task is compounded by the stochastic nature, long latency and high, variable non-radiological background of generic health effects. Also, there is an on-going debate over a linear versus threshold response at low doses. The importance of dietary chemoprotectors and other biological response modifiers and other environmental and genetic determinants of individual radiosensitivity in the fields of radiation protection, regulatory limits and epidemiological risk estimation, will be discussed.

Thursday, June 14 - 12:15-2:15 PM

TH-1 Fundamentals of Air Effluent Monitoring. ***W. T. Bartlett; CBFO Technical Assistance Contractor***

The lessons of accidents, environmental regulations, improved monitoring technology and consensus standards have contributed to significant improvements in air effluent monitoring over the last two decades. Health physicists must considered a host of factors, such as potential radiological source term, facility design, safety basis, air dispersion potential, and emergency response objectives, when developing and reviewing air monitoring programs.

This course will briefly review events that changed air monitoring technology, the conceptual design basis of monitoring equipment and systems, the ANSI N 13.1-1999 standard and unusual challenges in designing air-monitoring programs. Examples and unique challenges of measuring airborne transuranic radionuclides in the dusty environment of the Waste Isolation Pilot Plant salt mine will be discussed. There will be opportunity for discussion and participation by attendees.

TH-2 Final Status Surveys Using the MARSSIM Process. ***J. Berger; Safety and Ecology Corporation***

The process described in the Multi-Agency Radiation Survey and Site Assessment Manual (MARSSIM) for designing a final status radiological survey need not be intimidating. This is particularly true when it is not necessary to establish site-specific dose-based guidance levels-a situation commonly encountered when dealing with radioactive contaminants classified as mill tailings and state-regulated NORM and for cases where "default" values or other predetermined criteria have been identified by the cognizant organization. Following the guidance and direction

for MARSSIM, the average physicist, equipped with basic fundamentals of radiation measurement and statistics, and using logic and common sense, should have little difficulty in designing an effective final status survey. Likewise, evaluation and interpretation of MARSSIM-approach survey data need not be a difficult task.

This course will "walk" the participants through the design and data evaluation processes. Examples will progress from a single radioactive contaminant that is not present in the background to multiple, naturally-occurring contaminants. Design and evaluation of surveys for hard-to-detect contaminants, using composite samples to limit analytical costs, will be described.

TH-3 Highlights of the New HPS Standard, American National Standard for Design of Internal Dosimetry Programs. ***D. Bihl; Pacific Northwest National Laboratory***

At the time of this course, the new HPS standard N13.39, *American National Standard for Design of Internal Dosimetry Programs*, will have been recently released or will soon be released. Unlike its predecessor ANSI or HPS internal dosimetry or bioassay standards, N13.39 has applicability to anyone responsible for an internal dosimetry program and is not linked to a specific radionuclide or grouping of radionuclides. Indeed, one purpose of the standard is to provide the fundamentals for designing or operating an internal dosimetry program so that radionuclide-specific standards can focus on their unique aspects and not reinvent the wheel, i.e., restate the basics of a program. The course will cover key requirements and recommendations of the standard. For instance, when should I place workers on bioassay? How good does my program have to be? What should I do when something of concern is detected in a bioassay sample? When is an intake confirmed? What should be my recording and reporting practices? How much documentation do I need? What about large, accidental intakes? In addition, two helpful appendices will also be discussed briefly, one providing guidance on when to place workers on a bioassay program based on workplace conditions, and the other discussing the nebulous topic of uncertainties in internal doses.

TH-4 Radiological Assessment Techniques. ***E. Messer Wright; Dade Moeller & Associates, Inc.***

This Professional Enrichment Program (PEP) course originated from a 16-hour course developed by William H. Barley, Rosebar Enterprises and Ellen Messer Wright, Dade Moeller & Associates. The original course was designed to give personnel the knowledge and skills they need to formally evaluate aspects of a radiological control program.

The PEP course provides a brief overview of radiological assessment techniques that an assessor can use to:

- Plan assessments
- Develop assessment criteria
- Perform assessments
- Interview personnel and
- Document findings.

Students improve their assessment skills by participating in an observation techniques exercise and identifying the "do's" and "don't's" of the interview process.

Target Audience: Department of Energy federal and contractor personnel, including facility representatives, independent oversight regulators, and health physics professionals who will be performing audits, self-assessments, surveillances, and team assessments.

Radiation Dosimetry Management: Dosimeter Characteristics, Quality

TH-5 Depleted Uranium in the Environment. ***H. M. Prichard, L. W. Cole; Auxier & Associates, Inc.***

Depleted uranium (DU) is used in a number of industrial products and military applications. Accidents or acts of war can result in the release of DU to the general environment. This course is directed towards the health physicist who may be called upon to respond to such a release, or to provide informed commentary on the implications of such a release. The radiological and chemical effects of DU in various chemical forms are reviewed, and options for short-term and long-term bioassay are discussed. Current literature regarding environmental transport and persistence in the environment will be summarized. The course will conclude with a discussion of remediation criteria, detection techniques, and recent news media reports.

TH-6 Development of Megavoltage Absorbed Dose Standards. ***D. V. Webb, R. B. Huntley, J. F. Boas, K. N. Wise; Australian Radiation Protection & Nuclear Safety Agency, Australia***

In Australia, the calibration of radiotherapy beams from linear accelerators has been referenced to an air kerma calibration at ^{60}Co and the extension to higher energies is made by means of the Australian/New Zealand protocol based on that of the International Atomic Energy Agency (IAEA 1987). More recently, an absorbed dose to water calibration at ^{60}Co has been adopted following a revised IAEA protocol. For nominal beam energies above 4-6 MV, another approach is to establish standards of absorbed dose directly and compare instruments with a standard at the relevant quality. This approach is becoming more widespread as higher energy therapy beams are increasingly being used.

The Australian Radiation Protection & Nuclear Safety Agency (ARPANSA) has a 21 MeV electron linear accelerator that is being used to set up a high energy absorbed dose to water calibration service, similar to that offered by the National Physical Laboratory (NPL) in the UK. While the two laboratories employ similar linear accelerators, they differ in several significant ways, so that the beams produced have slightly different characteristics. Both laboratories base the primary standard on graphite calorimetry, and use the photon fluence scaling theorem to convert from graphite to water absorbed dose.

The graphite calorimeter was purchased from the Austrian Research Centre Seibersdorf (ARCS) in 1991. This is a fully operational primary standard similar to those supplied by ARCS to the Austrian, Hungarian and Italian National Standards laboratories, and is based on the NIST Domen design.

For calibrations against transfer standard ionisation chambers, a water phantom is used with a 3-dimensional probe movement system that has been developed at ARPANSA. The PC controller also coordinates data acquisition and a code has been written in 'C' to automate beam profile, depth dose and quality index measurements. Using the PC motion control system, the calorimeter and its equivalent graphite phantom can be coordinated with the water phantom to provide a consistent sequence of measurements in a particular beam.

An intercomparison of absorbed dose responses was performed in 1995/96 between ARL and NPL at several X-ray beam qualities between 16 and 19 MV. Reference air cavity chambers from ARL were exchanged with similar NPL chambers and calibrated in each laboratory to establish the equivalence of the beam qualities being used. Since then, the responses of further cavity chambers, nominally of the same type, have been obtained at the same beam qualities. Differences are seen that could lead to significant errors if common dosimetry protocols are used without a careful consideration of the nature of the beams produced by hospital and standards laboratory linacs.

2001 Exhibit Hall Floorplan

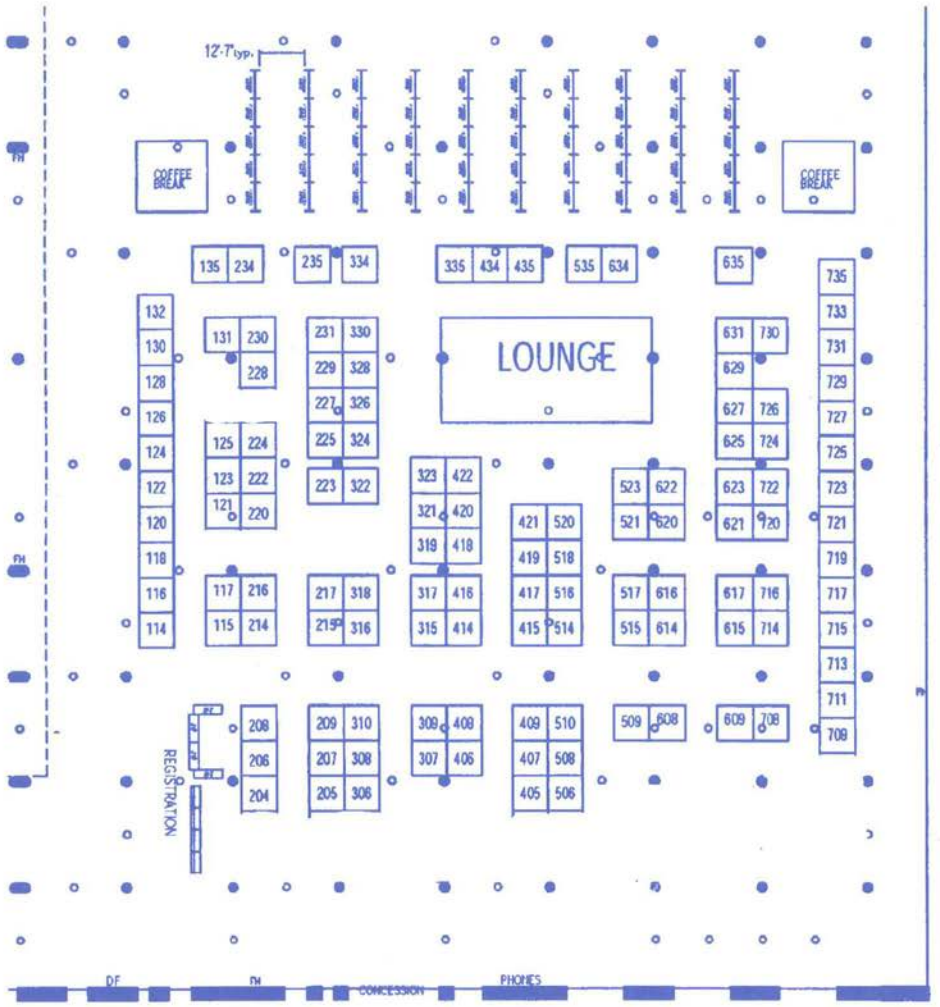

Exhibit Hall Hours

Cleveland Convention Center

Monday ..... *Noon - 5:00 pm*

Tuesday ..... *9:30 am - Noon and 2:30 - 5:00 pm*

Exhibit Hall Closed Tuesday (Noon-2:30 PM) for the Awards Luncheon

Wednesday ..... *9:30 am - Noon*

2001 Exhibitors

2002 ANNUAL MEETING-TAMPA *Booth 207*

AAHP *Booth 711*

ADCO SERVICES, INC. *Booth 414*
Disposal of Radioactive, hazardous, and non-hazardous wastes.

AEA TECHNOLOGY QSA, INC. *Booths 228, 230*
Formerly trading as Amersham Corporation, AEA Technology QSA, Inc. offers a complete range of Isotrak reference sources and solutions for instrument calibration and environmental monitoring. Isotrak introduces the new DoseGUARD Plus personal electronimeter which responds to beta radiation, gammas from as low as 15keV.

ALPHA SPECTRA, INC. *Booth 730*
Alpha Spectra, Inc. manufactures gamma-ray detectors for health physics, academic, industrial, medical and exploration applications. Scintillation materials used include most of the common phosphors e.g. NaI(Tl), BGO, plastics, etc.

AMERICAN NUCLEAR SOCIETY *Booths 714, 716*
The American Nuclear Society publishes Nuclear News, Radwaste Solutions, technical journals, standards and position statements. Its 11,000 members represent to the government and the public a unified voice in support of nuclear science and technology.

ANALYTICS, INC. *Booth 225*
Analytics manufactures/sells the world's highest quality radionuclide calibration standards (NIST traceable). We also specialize in custom calibration standards, radiochemistry and environmental cross check programs.

APTEC-NRC INC. *Booths 405, 407, 409, 506, 508, 510*
Equipment to be featured will be the complete line of Aptec-NRC and Eurisys Mesures health physics and analytical instrumentation for the identification, monitoring, quantifying and detection of all forms of nuclear radiation.

BARTLETT NUCLEAR, INC. *Booth 117*
Bartlett has over 20 years of experience providing health physics, decontamination, mechanical maintenance, janitorial, and other staff augmentation services to the nuclear industry and Department of Energy facilities.

BERKELEY NUCLEONICS CORP. *Booth 434*
SAM 935 Sodium Iodide Gamma Spectroscopy System.

BIONOMICS, INC. *Booth 132*
Radioactive and Mixed Waste Management and Disposal Services.

BIOSCAN, INC. *Booth 731*
Radiation Monitoring Solutions.

CANADIAN RADIATION PROTECTION ASSOCIATION *Booth 723*

CANBERRA INDUSTRIES ***Booths 121, 123, 125, 220, 222, 224***

Equipment for high resolution in situ gamma spectroscopy laboratory alpha and gamma spectroscopy, low background alpha beta systems, air monitors, and HP management software.

CHASE ENVIRONMENTAL GROUP INC ***Booth 229***

Radioactive waste management: waste characterization; sealed sources disposal/recycle; contaminated scrap, soil, trash disposal; mixed waste treatment/disposal; radioactive remediation and services.

COMTRONICS INDUSTRIAL COMMUNICATIONS ***Booth 322***

Manufacturer, distributor and consultant for head sets, wireless intercoms, two-way radios, inbuilding cellular systems, specializing in nuclear outages, plastic suit work, refuel floor coordination, e.p. drills. Brands include Telex, Earmark, Motorola, Ascom.

CSI-RADIATION SAFETY ACADEMY ***Booth 523***

A leader in radiation safety training since 1983. Monthly classes for RSOs, health physicists, researchers, sealed source and gauge users, radiation workers, DOT, and HAZMAT responders. Quarterly classes on D & D, radwaste, advanced RSO, radiation risk communication, train-the-trainer, and risk assessment. Training provided by CHPs, including Ray Johnson, Dr. Alan Fellman, Sean Austin, Steve Keller, and others. Consultation, license applications, and program audits by CHPs and NRRPTs. On-site training to meet your needs.

DUKE ENGINEERING & SERVICES ***Booth 408***

Decontamination and Decommissioning Services, dosimetry and radioanalytical Laboratory Services, health physics services, health and safety Consulting, nuclear engineering, environmental monitoring, and emergency planning. General plant engineering services.

DURATEK ***Booth 328***

Decontamination and decommissioning; radioactive waste processing; radioactive materials transportation; radiological instrumentation calibration, leasing and repair; health physics training and consulting.

EARTH TECH ***Booth 719***

Earth Tech can provide a wide range of health physics and radiation services including RESRAD, MARSSIMS and microshield modeling. As well as radiation investigations, surveys, training, management place, oversight, and characterizations.

EBERLINE SERVICES ***Booth 122***

With 50+ years of experience providing radiological services, Eberline Services offers broad capabilities in radiological characterization and analysis; hazardous, radioactive, and mixed waste management; and facility environmental, safety, and health management. For more information, contact us at: marketing@eberlineservices.com or visit our web site at: www.eberlineservices.com.

ENVIRONMENTAL DIMENSIONS INC. ***Booth 206***
Automated radiation detection instrumentation calibration technologies. Automated Response Calibration Station (ARCS) and other environmental services.

EUCLID GARMENT MFG. CO. ***Booth 635***
Euclid Garment Mfg. will display a full line of incinerable, nuclear related protective clothing and accessories. Coveralls, hoods, boots, bags, in a variety of fabrics and styles will be highlighted. Euclid is regarded as the industry leader in quality and garment design.

EXPLORANIUM ***Booth 223***
Exploranium is an international leader in the design, manufacture and sales of low level radiation detection and measurement systems for health physics applications.

F&J SPECIALTY PRODUCTS, INC. ***Booth 621***
F & J provides portable, fixed and environmental air monitoring systems, airflow calibrators, filter holders, filter paper, radioiodine collection cartridges (including TEDA impregnated charcoal and silver zeolite) and radon detection devices. Services include calibration of air monitors and repairs to calibrators and air samplers. F & J welcomes requests for custom projects.

FEMTO-TECH INC. ***Booth 713***
Manufacturer of Continuous Radiation in Air and Process Instrumentation.

FRHAM SAFETY PRODUCTS INC. ***Booth 114***
Founded on customer service, Frham Safety Products Inc. is a leading supplier of Nuclear and Industrial safety equipment throughout North America. Serving both commercial and governmental facilities, Frham offers innovative radiation and contamination protection, HP supplies, rad-waste reduction items and custom manufacturing.

FUJI ELECTRIC CO LTD ***Booth 509***
Electric and personal dosimeters and chargers.

GAMMA PRODUCTS INC. ***Booth 623***
G520 Desktop or Traveler a/b counting system.

GE REUTER STOKES ***Booth 727***
GE Reuter-Stokes is a leading provider of harsh environment sensor solutions for the most demanding applications. The exhibit will feature the RSS 131 Environmental Monitor, a self-contained "Smart Sensor" for Environmental Gamma Monitoring and He_3 detectors that operate with extreme sensitivity.

GENERAL ENGINEERING LABORATORIES, INC ***Booth 722***
Chemical, Radio-chemical, Bioassay and Geotechnical Environmental laboratory testing

GEORGIA INSTITUTE OF TECHNOLOGY ***Booth 208***
Co-60 irradiations, radiation instrumentation development, dosimetry research, health physics degree programs and distance learning program.

GUTIERREZ-PALMENBERG, INC *Booth 721*
Radiation Protection Automation System Software

HEALTH PHYSICS INSTRUMENTS *Booth 415*
HPI manufactures high quality portable and fixed radiation measuring instruments, including alpha, beta, gamma and neutron survey meters, area monitors, personnel dosimeters, REM meters, environmental monitors and multichannel analyzers.

HISTORY COMMITTEE *Booth 205*

HI-Q ENVIRONMENTAL PRODUCTS CO. *Booth 520*
Hi-Q is a leading manufacturer of Air Sampling Equipment, Systems and Accessories. Hi-Q's product line includes: High & low volume air samplers, air flow calibrators and calibration services, radioiodine sampling cartridges, filter paper, filter holders and complete stack sampling systems.

HPS *Booth 709*

HPS PUBLICATIONS *Reg Area*

HPS STANDARDS *Booth 717*

ICN DOSIMETRY SERVICE *Booths 627, 629, 631*
ICN Dosimetry Service offers a full range of services for radiation monitoring, primarily through film, thermoluminescent, and track etch badges.

INDUSTRIAL VIDEO SYSTEMS, INC. *Booth 235*
Leading manufacturer of closed circuit television systems for ALARA and HP job coverage. Systems include matrix switching, two way audio, and dosimetry capability.

INOVISION RADIATION MEASUREMENTS *Booths 316, 318*
Inovation Radiation Measurements (IRM) is the successful alliance of two of the leading suppliers of radiation measurement instrumentation in the world today. Victoreen, Inc. and Keithley Radiation Measurements Division have combined operations to design, manufacture and supply electronic instrumentation for the detection and measurement of ionizing radiation. We will have all of the survey meters and probes along with the electrometers on display. Our new Calibration and repair service brochure will also be available to introduce you to the "World Class" Calibration Lab that has been built in our new facility and ready to serve all of your calibration needs.

ISOTOPE PRODUCTS LABORATORIES *Booths 514, 516*
Isotope Products Laboratories is a NIST traceable laboratory supplying radioactive standards, sources and nuclides for counting room use, instrument calibration and environmental monitoring, specializing in custom requirements.

J. L. SHEPHERD & ASSOCIATES *Booth 330*
Gamma, beta and neutron instrument calibration and dosimeter irradiation facilities, gamma research irradiators, process irradiators, and blood component irradiators. Source/device decommissioning.

K & S ASSOCIATES ***Booth 615***
Calibration services-accredited survey meter-HPS, kVp meter calibration, diagnostic calibrations, TLD measurements, equipment evaluation and repair, AAPM accredited services.

LABORATORY ***Booths 609, 708***
IMPEX SYSTEMS LTD.
Design and manufacture of health physics instrumentation for various applications, including stack monitoring, area monitoring, lung dose assessment and emergency response.

LANDAUER INC. ***Booths 319, 321, 323, 418, 420, 422***
Landauer is the nation's leading provider of personnel radiation dosimetry services. New OSL technology, Luxel® dosimeter, measures x-ray, beta and gamma radiation along with neutron detection capabilities. NVLAP accredited. Landauer offers a full range of reports, ALARA aids, interactive computer systems, dosimetry management PC software and other related services.

LASER INSTITUTE ***Booth 118***
OF AMERICA
Laser Institute of America is the professional society dedicated to fostering lasers, laser applications and laser safety worldwide. The LIA provides ABIH-accredited laser safety training courses. offers safety standards and guides; including the LIA Guide to Non-Beam Hazards Associated with Laser Use.

LND, INC. ***Booth 521***
Designers and manufacturers of Nuclear Radiation Detectors including: GM tubes, X-Ray proportional counters, BF_3 & He_3 Neutron Detectors Ionization chambers, and flow proportional counters.

LUDLUM ***Booths 214, 216***
MEASUREMENTS, INC.
Ludlum Measurements, Inc. will be demonstrating some of its new designs in health physics instrumentation.

MGP INSTRUMENTS ***Booth 625***
MGP Instruments designs, develops, markets and supports operational survey equipment and measurement systems in order to protect people, facilities and the environment against technological hazards and threats.

MJW CORPORATION ***Booth 334***
INC.
MJW Corporation provides a variety of radiological consulting services to private industry and government agencies as well as innovative software solutions for health physics and other technical industries.

NRRPT ***Booth 308***

NSSI ***Booth 310***
Radioactive, hazardous, and mixed waste treatment. Tritium recovery. Treatment of high hazard chemicals and gases.

OAK RIDGE ***Booth 128***
ASSOCIATED UNIVERSITIES
ORAU provides a variety of services in the radiological sciences: Training, environmental surveys, decommissioning, epidemiology, emergency response.

ON SITE SYSTEMS, INC. ***Booth 309***
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XRF Corporation manufactures lab quality analytical instrumentation to detect gamma radiation and x-rays in the field. These compact, high resolution instruments can be used for gamma ray spectroscopy, isotope identification, and dosimetry. Custom detectors and probes can be developed for specific applications.

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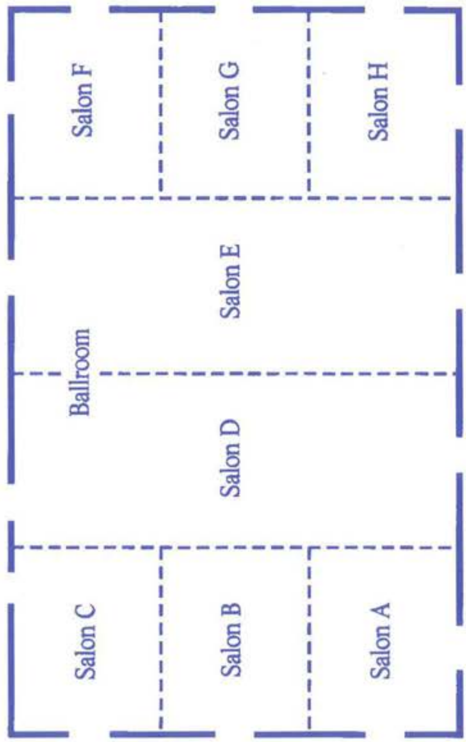
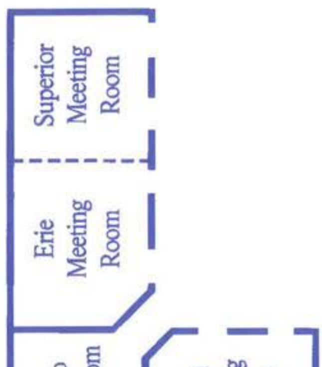
Cleveland Marriott





Saturday, June 9

AAHP 1 Project Management for Health Physicists
8:00 am - 5:00 pm Marriott Ballroom A/B

AAHP 2 OSHA Refresher Training
8:00 am - 5:00 pm Marriott Ballroom H

ABET PEP **Part 1**
1:00 - 5:00 pm Marriott Ballroom F

Sunday, June 10

ABET PEP **Part 2**
8:00 am - Noon Marriott Ballroom F

All PEPs will be held at the Cleveland Convention Center

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

PEP 2-A thru 2-G
10:30 am - 12:30 pm

PEP 3-A thru 3-I
1:30 - 3:30 pm

PEP 4-A thru 4-H
4:00 - 6:00 pm

Welcome Reception
6:00 - 7:30 pm Marriott Ballroom E/F/G/H and Foyer

Sunday - Thursday

All Technical Sessions, CEL's PEP's and Awards Luncheon are at the Cleveland Convention Center

Monday, June 11

CEL-1 Military Uses and Implications of Depleted Uranium.
7:15 - 8:15 am 230A

CEL-2 The Very High Background Radiation Area in Ramsar Iran: Geology, Epidemiology, and Policy.
7:15 - 8:15 am 205B

ABHP Exam - Part I
8:00 -11:00 am Marriott Ballroom E/F/G/H

Plenary Session
8:30 -11:30 am Music Hall

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

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

M-1 Effective Use of the MIRD System for Medical Internal...(201)

M-2 Safety and Health Mgmt. for Decontamination and ...(203)

M-3 The History of Release Criteria: From *de minimis* to BRC, to Clearance (205A)

M-4 Radon Measurement and Mitigation – A Satisfying and Lucrative Ancillary Service...(202)

M-5 CANCELLED

M-6 Radiation Dosimetry Mgmt: Dosimeter Characteristics,... (212A)

ABHP Exam - Part II
12:30 - 6:30 pm Marriott Ballroom E/F/G/H

HPS Chapter Council
1:00 - 2:30 pm 230A

Poster/WIP Session
1:30 - 3:00 pm Exhibit Hall B

MPM-A Regulatory/Legal
3:00 - 4:00 pm 230A

MPM-A Risk Analysis
4:00 - 5:00 pm 230A

MPM-B Waste Management
3:00 - 4:30 pm 230B

MPM-C Gov't Section Session Pt. I - The International Atom
3:00 - 5:00 pm 205B

MPM-D External Dosimetry
3:00 - 4:45 pm 212B

MPM-E Current Issues in Health Physics Instrumentation
6:00 - 7:30 pm Marriott Ballroom D

Student Reception
5:00-6:00 pm Marriott Ballroom C

STC Workshop on Hosting Science Teacher Workshops
7:00-10:00 pm Marriott Ballroom A/B

Tuesday, June 12

CEL-3 New Regulations and Guidance for Dealing with Radioactivity in Solid Waste in Pennsylvania
7:15 - 8:15 am 230A

CEL-4 Intravascular Brachytherapy: An RSO's Perspective
7:15 - 8:15 am 205B

TAM-A Medical
8:30 - 10:30 am 230A

TAM-B Internal Dosimetry
8:15 - 11:45 am 230B

TAM-C Government Section Session Part II- Non-Ionizing
8:30 - 11:00 am 205B

TAM-D Accelerator Section Section
8:15 - 10:45 am 212B

Medical Section Business Meeting
10:30 am 230A

Government Section Business Meeting
11:00 am 205B

Accelerator Section Business Meeting
10:45 am 212B

HPS Awards Luncheon
Noon - 2:00 pm Public Auditorium

TPM-A ABHP
2:15 - 5:15 pm 230A

TPM-B Release of NCRP Report on Linearity
2:30 - 5:30 pm 230B

TPM-C RSO Section Session
2:15 - 4:45 pm 205B

TPM-D Special Session: Plutonium Exposure at LANL
2:15 - 5:15 pm 212B

RSO Section Business Meeting
4:45 pm 205B

Wednesday, June 13

CEL-5 Issues in Intravascular Radiation Therapy
7:15 - 8:15 am 230A

CEL-6 NCRP Report on the Management of Terrorist Events...
7:15 - 8:15 am 205B

WAM-A Decommissioning
8:15 - 10:00 am 230A

WAM-A Decommissioning Section Session
10:30 - 11:30 am 230A

WAM-B Special Session: Reassessment of A Bomb Radiation Dosimetry
8:15 am - Noon 230B

WAM-C Environmental
8:15 - 11:00 am 205B

WAM-D Special Session: New and Changing Paradigms in .... Part I
8:30 - 11:30 am 212B

Environmental Section Business Meeting
11:00 am 205B

Decommissioning Section Business Meeting
11:30 am 230A

AAHP Awards Luncheon
Noon - 2:30 pm Marriott Ballroom E/F/G/H

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

W-1 The Role of the Health Physicist in Accident ...(201)

W-2 Accelerator Radiation Safety (203)

W-3 Mutations and Time (205A)

W-4 Risk Perception in General and the Debate over ...(202)

W-5 Quantities and Units for Radiation Protection (210)

W-6 Health Effects and Effective Radiation Protection (212A)

WPM-A Public Education Committee: Science Teacher ...
2:30 - 5:30 pm 230A

WPM-B Radiation Worker Safety
2:30 - 5:30 pm 230B

WPM-C Environmental Section-Protecting the Environment from ...
2:30 - 5:30 pm 205B

WPM-D Special Session: New and Changing Paradigms in ...Part II
2:30 - 4:30 pm 212B

AAHP Open Meeting
4:30 pm 212 B

HPS Business Meeting
5:30 - 6:30 pm 230A

WPM-E Aerosol Measurements
6:00 - 8:15 pm Marriott Ballroom D

Thursday, June 14

CEL-7 Ten Principles and Ten Commandments of Radiation Protection.
7:15 - 8:15 am 230A

CEL-8 Current Issues in Offsite Nuclear Power Plant Emergency Planning in Ohio.
7:15 - 8:15 am 205B

THAM-A Operational Health Physics
8:30 - 11:30 am 230A

THAM-B Special Session: Stable Tritiated Compounds
8:30 - Noon 230B

THAM-C Radionuclide NESHAPs
8:15 - 10:30 am 205B

THAM-D Radon
8:15 - 9:15 am 212B

THAM-D Radon Section Session
9:15 - 11:15 am 212B

Radionuclide NESHAPs Annual Meeting
10:30 am 205B

Radon Section Business Meeting
11:15 am 212B

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

TH-1 Fundamentals of Air Effluent Monitoring. (201)

TH-2 Final Status Surveys Using the MARSSIM Process. (203)

TH-3 Highlights of the New HPS Standard, American National Standard for Design of Internal Dosimetry Programs. (205A)

TH-4 Radiological Assessment Techniques. (202)

TH-5 Depleted Uranium in the Environment. (210)

TH-6 CANCELLED

Registration Hours

Registration will take place at the Cleveland Convention Center

Sunday	*7:00 am - 7:00 pm*
Monday	*8:00 am - 4:00 pm*
Tuesday	*8:00 am - Noon; 2:30 - 4:00 pm*
Wednesday	*8:00 am - 4:00 pm*
Thursday	*8:00 am - Noon*

Exhibit Hall Hours

Convention Center

Monday	*Noon - 5:00 pm*
Tuesday	*9:30 am - Noon; 2:30 - 5:00 pm*
Wednesday	*9:30 am - Noon*

Exhibit Hall Closed Tuesday, Noon-2 PM for the Awards Luncheon

Breaks Monday PM-Wednesday AM

Featuring morning continental breakfasts and afternoon refreshments. Be sure to stop by and visit with the exhibitors while enjoying your refreshments!