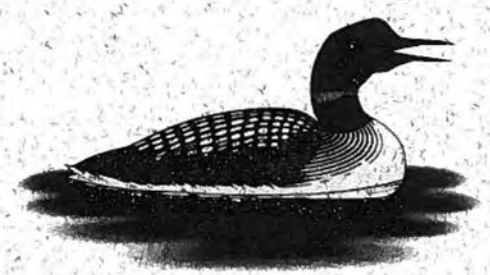
-THE BLACK MASTER

Health Physics Society

43rd Annual Meeting & Exhibition

July 12-16, 1998

Minneapolis, Minnesota



Final Program

Headquarters Hotel:
Minneapolis Hilton: (612) 376-1000
Guest FAX: (612) 397-4875

Session and Exhibit Location:
Minneapolis Convention Center

Sue schedule:

Fri - Copy guy - Lunch 11:30
Hotel precon 2:00
CC precon 3:30
Bag stuffing / pizza

Sat - AAHP courses Am
Calhoun Beach Club 10
Symp. Comm 2:00
Regis. 3-6

HPS Secretariat
1313 Dolley Madison Blvd.
Suite 402
McLean, VA 22101
(703) 790-1745
FAX: (703) 790-2672
Email: HPS@BurkInc.com
Web Site: http://www.hps.org

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Registration Hours

Saturday, July 11 ..... 3:00 - 6:00 pm (Minneapolis Hilton)
Sunday, July 12 ..... 7:00 am - 7:00 pm (Minneapolis Hilton)
Monday, July 13 ..... 8:00 am - 4:00 pm (Conv. Center)
Tuesday, July 14 ..... 8:00 am - 4:00 pm (Conv. Center)
Wednesday, July 15 ..... 8:00 am - 4:00 pm (Conv. Center)
Thursday, July 16 ..... 8:00 am - Noon (Conv. Center)

Affiliates Program

Monday, July 13 ..... Noon - 5:00 pm
Tuesday, July 14 ..... 9:30 am - 5:00 pm
Wednesday, July 15 ..... 9:30 am - 4:00 pm

1998 PROGRAM COMMITTEE

LYNNE A. FAIROBENT, CHAIR
CINDY BOGGS
MICHAEL G. COBIAN
KATHLEEN D. DINNEL
ROBERT J. EMERY
KEN L. GROVES
CRAIG A. LITTLE
BRUCE D. PICKETT
PAUL G. VOILLEQUÉ

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KEITH H. DINGER, President-Elect
RAYMOND H. JOHNSON, JR., Treasurer
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RICHARD J. BURK, JR., Executive Secretary

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Richard E. Toohey
Richard J. Vetter

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Frederick Entwistle, Local Arrangements Co-Chair
Frank Massé, Presidents Emeritus Chair
Roger Kloepping, Strategic Planning Chair
Kenneth L. Miller, Editor-in-Chief of *Health Physics*
Genevieve S. Roessler, Editor-in-Chief of *HPS Newsletter*

Past Presidents

1955-1957	K. Z. Morgan
1957-1958	F. P. Cowan
1958-1959	L. S. Taylor
1959-1960	E. E. Anderson
1960-1961	J. S. Laughlin
1961-1962	W. D. Claus
1962-1963	C. M. Patterson
1963-1964	W. T. Ham, Jr.
1964-1965	H. L. Andrews
1965-1966	M. Eisenbud
1966-1967	J. R. Horan
1967-1968	W. S. Snyder
1968-1969	W. H. Langham
1969-1970	J. N. Stannard
1970-1971	C. C. Palmiter
1971-1972	D. W. Moeller
1972-1973	R. D. Evans
1973-1974	N. Wald
1974-1975	J. C. Hart
1975-1976	P. L. Ziemer
1976-1977	J. C. Villforth
1977-1978	J. A. Auxier
1978-1979	C. M. Unruh
1979-1980	M. W. Carter
1980-1981	W. C. Reinig
1981-1982	C. B. Meinhold
1982-1983	R. J. Cloutier
1983-1984	B. L. Rich
1984-1985	W. J Bair
1985-1986	J. E. Watson, Jr.
1986-1987	J. W. Poston
1987-1988	D. A. Waite
1988-1989	R. E. Alexander
1989-1990	R. L. Kathren
1990-1991	G. S. Roessler
1991-1992	F. X. Massé
1992-1993	K. J. Schiager
1993-1994	K. L. Mossman
1994-1995	M. Goldman
1995-1996	W. A. Mills
1996-1997	R. J. Vetter

Local Arrangements Committee

Jan Braun, Co-chair
Fred Entwistle, Co-chair
Jan Braun - Web Site, Polo Shirts
John Bauhs - Tours
Travis Beard - PEP
Kelly Classic - HPS Newsletter, Daily Newsletter
Mike Cobian - Program Committee Liaison
Doug Gossen - A/V, Student Scheduling
Ralph Grunewald - Floor Manager
Duane Hall - Treasurer
Anne Harri - Tours
Mike Hinz - Awards Luncheon, LAC Room, ABHP Exam Liaison
Pete Johnson - Affiliates Liaison
Dee Kaiser - Floor Manager
Mike Lewandowski - A/V, Student Scheduling
Deb Loeser - Awards Luncheon, LAC Room
Anne McGrane - Hospitality Room, Local Information
Dan McGrane - Hospitality Room, Local Information
Jamie Miller - Logo
Bill Patrek - 5K Run and HealthWalk
Irene Patrek - HPS Newsletter, Daily Newsletter
Kermit Paulson - Summer School
Mike Pfeffer - Floor Manager
Jerome Rademacher - 5K Run and HealthWalk, T-shirts
Charles Roessler - Summer School
Greg Smith - Floor Manager
James Stauffer - Web Site
Brian Vetter - Night Out
Pete Wildenborg - PEP

Registration Fees

Class	Pre-Reg.	On-Site
♦Member	$225	$300
♦Non-Member**	$300	$375
♋Student	$ 40	$ 40
♓Companion	$ 45	$ 45
Exhibits only	$ 25	$ 25
Exhibitor (2/Booth)	No Fee	
●Member, 1 Day	n/a	$195
●Non-Member, 1 Day	n/a	$195
♋ Student, 1 Day	n/a	$ 25
Add'l. Awards Luncheon Tickets	$ 30	$ 30
Night Out Tickets		
Adults	$42	$ 47
Children	$18	$ 23

♦ Includes Sunday Reception, Monday Lunch and Thursday Awards Luncheon
♋Includes Sunday and Student Receptions, Monday Lunch and Thursday Awards Luncheon
♓ Includes Sunday Reception, Monday Hospitality Mixer Breakfast, Monday Lunch
● Includes Sessions and Exhibitions **ONLY**

** $75 of fee applicable towards NEW HPS Membership if **Completed Application is submitted by September 25, 1998**

Registration Hours

Saturday, 7/11 ..... 3–6 PM
Sunday, 7/12 ..... 7 AM–7 PM
Monday, 7/13..... 8 AM–4 PM
Tuesday, 7/14 ..... 8 AM–4 PM
Wednesday, 7/15 ..... 8 AM–4 PM
Thursday, 7/16 ..... 8 AM–Noon

Information

Speaker Instructions

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

The **Ready Room** (204 A/B) in the Convention Center will be open Monday from 7:00–11:00 am and 1:00–4:00 pm, Tuesday from 8:00–10:30 am and 1:00–4:00 pm and Wednesday from 8:00–10:30 am and 1:00–3:30 pm. Slides are to be brought to the designated ready room for loading and previewing no later than the time indicated below:

Present. Time	Delivery Deadline
Monday PM	7–11 am Monday
Tuesday AM	1–4 pm Monday
Tuesday PM	8–10:30 am Tues.
Wednesday AM	1–4 pm Tuesday
Wednesday PM	8–10:30 am Wed.
Thursday AM	1–3:30 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 Rooms 207 A/B (Convention Center), with hours from 8:00 am to 5:00 pm, Monday through Wednesday, and 8:00 am - noon on Thursday. Interviews may be conducted in the designated areas of the Placement Center.

Business Meeting

The **Annual Business Meeting** will be convened at 5:00 pm on Wednesday, July 15, in Room 101 A/B(Convention Center).

Awards Luncheon

The **Awards Luncheon** will be held from 12:30 - 2:30 pm on Thursday, July 6, in the Hilton Ballroom, Salons D/E/F/G. The following awards are to be presented:

Founders Awards
Frank Massé

Distinguished Scientific Achievement Award
Bruce Boecker

Elda E. Anderson Award
David Hintenlang

Fellow Class Awards
Lester Aldrich
Donald Barber
William Beck
James Berger
Reginald Gotchy
Roger Kloepping
Roger McClellan
Kenneth Miller
Harley Piltingsrud
Melvin Sikov
Robert Thomas
Paula Trinosky

Student Awards
To Be Announced

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

Mixed Field Greens
Entree to be Determined
Chef's Choice of Potato and Vegetable
Frango Mint Ice Cream Pie
Coffee, Tea, Decaf

Future Annual Meetings

44th 6/27-7/1,1999 Philadelphia
45th 6/25-29, 2000 Denver

Future Midyear Topical Meetings

32nd 1/24-27, '99 Albuquerque, NM
33rd 1/30-2/2, '00 Virginia Beach, VA

Companion Hospitality Suite

The Hospitality Suite in **Directors Row 2** at the Hilton will open Noon-4:30 pm on Saturday, July 11 and 8 am-4:30 pm on Sunday, July 12. Monday through Wednesday, July 13-15 from 7:30 am-4:30 pm and Thursday, July 16 from 7:30 am-Noon in **Lounge A** in the Convention Center. The suite will be a place to mingle, receive and leave messages and gather information on the many attractions to enjoy in Minneapolis and the surrounding area. There will be a complimentary Continental Breakfast Monday morning from 8:30-9:30 AM for all registered Companions, which will feature a safety and orientation to Minneapolis presentation.

ACTIVITIES AND TOURS

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

Sunday, July 12

Canoe Trip	8:30 AM-4:30 PM
City Tour	2-5 PM
Opening Reception	6-7:30 PM

Monday, July 13

Hospitality Ste. Mixer	8:30 AM
City Tour	Cancelled
Mall of America	1-5 PM
Minnesota Zoo	Cancelled
Microbrewery Tour	6-10 PM

Tuesday, July 14

5K Run/Health Walk	6:30 AM
Raptor Center	Cancelled
Valleyfair Park	Cancelled
Summit Ave. Tour	12:30-5:30 PM
Night Out	6:30-9:30 PM

Wednesday, July 15

Amish Tour	8 AM-5 PM
Bike Outing	8:30-11:30 AM
Child. Museum	Cancelled
Science Museum	Cancelled

Thursday, July 16

Prairie Island Tour	7 AM-Noon
Awards Luncheon	12:30-2:30 PM

Child Care

The following child care services are being listed as a convenience to HPS annual meeting attendees. Attendees should contact these providers directly to make arrangements. Plan ahead as summer is a very busy season for child care services.

Jack and Jill
612-429-2963

$8.00/hr base rate. Rate based on age, number, and health of children.

Parents also pay for meals, parking, and 25 cents/mile travel expenses. Cash only, no checks or credit cards.

YMCA
30 S 9th Street
Minneapolis 55402
612-371-8750

You can register in advance for YMCA on-site, full-day camps. Call them to request that registration materials be mailed or faxed to you, explain that you are coming for the meeting and cannot register in person. The program does fill up, so plan early. The YMCA is 5 blocks from the convention center, easy walking distance and is accessible through the skyways.

Program specifics:
Ages 5-12
Minimum sign-up period: 3 days/ week. You can sign up for any 3 days. If you need less than 3 days you still pay the 3 day rate.

Days of operation: Monday-Friday, no evenings or weekends

Drop off:	6:30 am-9:00 am
Pick up:	4:00 pm-6:30 pm
Prices:	3 days @ $57/child
	4 days @ $76/child
	5 days @ $95/child

If neither of these options will work for you, call the Early Childhood Resource Center (phone 612-721-0265). For a fee, they will assist you in finding a child care arrangement that fits your needs. HPS assumes no responsibility or liability for child care.

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 10CFR20. 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 HPS Welcome Reception will be held Sunday, July 12 from 6–7:30 pm at the Minneapolis Hilton, Ballroom Salons D/E/F/G.

Exhibits

Free Lunch! Free Lunch! – Noon, Monday, July 13. 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!

Sessions

Saturday – AAHP Courses will be held in the Minneapolis Hilton Hotel.

Sunday – PEP Sessions will be held in the Minneapolis Hilton Hotel.

Monday–Thursday – Sessions will be held at the Minneapolis Convention Center.

The **HPS Awards Luncheon** (Thursday, July 16, 12:30-2:30 pm) will be held at the Minneapolis Hilton, Ballroom Salons D/E/F/G.

NEW LAST YEAR–WE'RE DOING THESE AGAIN!

All posters (including student posters) up Monday–Wednesday in Exhibit Hall

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

AAHP Awards Luncheon - Tuesday, Noon-1:30 PM (see below for details)

PEP Refund Policy – See page 26

Walk or ride the Trolley to and from the Night Out

AAHP Awards Luncheon

The AAHP is sponsoring an Awards Luncheon on Tuesday, July 14, from Noon-1:30 pm in Room 211 A-D, Convention Center.

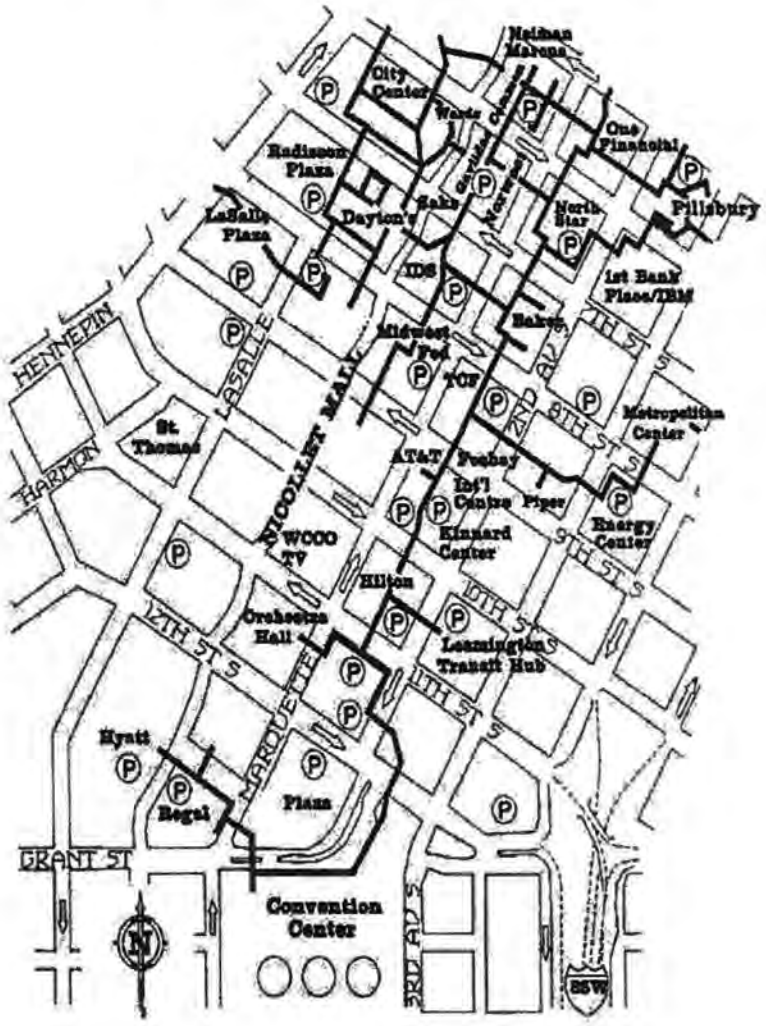
The following rate structure will apply:

1) Persons certified in 1997 ..... 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 Registration Desk.

Downtown Minneapolis Skyways

— Skyways Ⓟ Parking Ramps



HEALTH PHYSICS SOCIETY COMMITTEE MEETINGS

(H) = MINNEAPOLIS HILTON; (CC) = MINNEAPOLIS CONVENTION CENTER

Saturday, July 11, 1998

FINANCE COMMITTEE *(H)*
8:30 am-12:30 pm Directors Row 4

RULES COMMITTEE *(H)*
9 am-3 pm Crystal Terrace Lounge

ABHP BOARD MEETING *(H)*
9 am-5 pm Boardroom 2

CONTINUING EDUCATION COMMITTEE *(H)*
Noon-6 pm Boardroom 3

EXECUTIVE COMMITTEE *(H)*
1-5 pm Presidential Suite

STRATEGIC PLANNING COMMITTEE *(H)*
1-5 pm Directors Row 4

SYMPOSIA COMMITTEE *(H)*
1-5 pm Boardroom 1

HP EDITORIAL BOARD *(H)*
3-5 pm Rochester

Sunday, July 12, 1998

VENUES COMMITTEE *(H)*
8 am-2:30 pm Boardroom 3

HPS BOARD OF DIRECTORS *(H)*
8 am-5 pm Rochester

ABHP BOARD MEETING *(H)*
9 am-Noon Directors Row 4

AAHP EXECUTIVE COMMITTEE *(H)*
1- ??? pm Directors Row 4

PROGRAM COMMITTEE *(CC)*
1 pm 204 A/B

ANSI N43.1 *(H)*
1-6 pm Boardroom 1

STUDENT BRANCH COUNCIL MEETING *(H)*
4-6 pm Directors Row 1

Monday, July 13, 1998

ACADEMIC EDUCATION COMMITTEE *(CC)*
Noon-2 pm 206 B

PUBLICATIONS COMMITTEE *(H)*
Noon-2 pm Boardroom 1

ANSI N13.12 *(H)*
1-5 pm Boardroom 2

SCIENCE & PUBLIC ISSUES *(H)*
2-4 pm Carver

SUMMER SCHOOL COMMITTEE *(CC)*
Noon-2 pm 206 A

ELECTRONIC MEDIA *(CC)*
3-6 pm 206 B

PUBLIC EDUCATION COMMITTEE *(H)*
4-6 pm Boardroom 3

Tuesday, July 14, 1998

LABORATORY ACCREDIATION - POLICY *(H)*
11 am-1 pm Boardroom 2

HISTORY COMMITTEE *(CC)*
Noon-2 pm 206 A

MEMBERSHIP COMMITTEE *(CC)*
Noon-2 pm 206 B

ANSI N13.43 *(H)*
2-5 pm Boardroom 3

Wednesday, July 15, 1998

AFFILIATES COMMITTEE *(CC)*
7:30-9:30 am 211 A/B

STANDARDS COMMITTEE *(CC)*
8-11 am 206 A

ANSI WORKING GROUP HEALTH & SAFETY TECHNICIANS *(H)*
8 am-Noon Directors Row 2

HPSSC WORKING GROUP N13.48 *(CC)*
8:30-11:30 am 206 B

ALL PROGRAM HP FACULTY MEETING *(CC)*
Noon-2 pm 101 F

LEGISLATION AND REGULATION COMMITTEE *(CC)*
Noon-2 pm 206 B

LIAISON COMMITTEE *(CC)*
Noon-2 pm 206 B

NOMINATING COMMITTEE *(H)*
Noon-3 pm Boardroom 2

CHAPTER COUNCIL MEETING *(CC)*
1-2:30 pm 101 G/H

ASTM E10.04 *(H)*
2-5 pm Directors Row 2

IRPA DELEGATES *(CC)*
3-4 pm 201 A/B

Thursday, July 16, 1998

AWARDS COMMITTEE *(H)*
7:30-9 am Boardroom 3

LOCAL ARRANGEMENTS COMMITTEE *(CC)*
7:30-9:30 am 101 F

HPS BOARD OF DIRECTORS *(H)*
8 am-Noon; 2:30 pm-?? Hennepin

ANSI/HPS NORM WORKING GROUP *(CC)*
8 am-1 pm 206 A

PROGRAM COMMITTEE
2:45-5 pm Boardroom 3

Health Physics Society 43rd Annual Meeting

Minneapolis, Minnesota – July 12-16, 1998

Final Scientific Program

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: 101 G/H

CEL-1 Recent Developments in Radiation Litigation. *Davis Wiedis; Jose & Wiedis*

7:15-8:15 AM Room: 101 A/B

CEL-2 Positioning for Public Acceptance of Radiation Safety. *Raymond Johnson; CSI - Radiation Safety Training*

8:30-11:30 AM Ballroom A

Plenary Session
Managing Radiation Protection Programs in Changing Times

Chair: Otto Raabe; HPS President

8:30 **Opening.** *O. Raabe*
Welcoming Remarks. *J. Dyrstad; Former Minnesota Lt. Governor*

8:45 Overview: Decision-Makers Forum on a New Paradigm for Nuclear Energy. *O. G. Raabe; University of California, Davis*

9:30 The 21st Century: A Global Renaissance for Nuclear Energy and Challenges in Radiation Protection. *R. Beedle; NEI*

10:15 **Break**

10:45 **G. William Morgan Lecturer:** The Implementation of ICRP 60 into the European Radiation Protection Legislation. *K. E. Duftschmid; International Atomic Energy Agency, Austria*

Noon-1:30 pm Exhibit Hall

Lunch in Exhibit Hall for all Registrants and Opening of Exhibits

12:15-2:15 PM PEP Program

1:30 -3:00 PM Exhibit Hall

P: Poster Session

Instrumentation

P.1 Evaluation of a Transfer Standard Instrument for Calibration Accuracy, Photon Energy and Exposure Rate Dependence. *R. S. Clement, D. T. Seagraves, R. H. Olsher, J. I. Brandon and L. E. Myers; Los Alamos National Laboratory and Pacific Northwest National Laboratory*

P.2 A Compact Gamma Spectrometer with Built-in GPS Capability. *E. T. H. Clifford, J. Gamero, B. Selkirk, J. Chen, H. R. Andrews, T. McLean, H.Ing, T. Cousins, T. A. Jones, J. R. Brisson and B. E. Hoffarth; Bubble Technology Industries, Canada and Defence Research Establishment Ottawa, Canada*

P.3 Detection Limits for a Large Area Plastic Scintillator Detector. *S. W. Duce; IT Corporation, Knoxville, TN*

P.4 A New Design for an Albedo and Anti-Albedo Neutron Dosimeter. *H. H. Hsu and R. J. McKeever; Los Alamos National Laboratory*

Monday

P.5 Calibration of Pulsed Neutron Survey Meters at Los Alamos. *R. H. Olsher, R. S. Clement and J. I. Brandon; Los Alamos National Laboratory*

P.6 Modifications to DOELAP Calibrations Facility. *M. K. Zaidi, J. Robinson and R. Kershisnik; US Department of Energy, Idaho Falls, ID*

P.7 Analysis of the Measurement Characteristics of a Personal Alpha Dosimeter Used in Canadian Uranium Mines. *B. Bjorndal, G. Cubbon and R. Moridi; Canadian Institute for Radiation Safety*

P.8 Detection of Radon Daughters in Rainwater. *S. I. Baker; Argonne National Laboratory*

P.9 Beta Contamination Monitor Energy Response. *C. W. Bjork and R. H. Olsher; Los Alamos National Laboratory*

P.10 A Portable Geiger-Mueller Floor Monitor. *R. Landsworth, M. Rupert and K. Classic; Mayo Foundation*

P.11 Next Generation Model 8800 Automatic TLD Reader. *K. J. Velbeck, K. L. Streetz and J. E. Rotunda; Bicron•NE*

P.12 Design and Testing of a New User-Friendly Extremity Dosimetry System. *J. Fellinger, M. Majewski, J. E. Rotunda and K. J. Velbeck; Bicron GmbH, Germany and Bicron•NE*

P.13 Environmental Gamma Radiation Monitoring with Portable Instrumentation; Evaluation and Performance. *J. G. Johnston, R. J. Dmytryk, K. J. Velbeck and J. G. Bellian; Bicron•NE*

Waste Management and Decommissioning

P.14 Characterization of Radioactive Hazardous Waste. *S. B. Jones and B. Hooda; Westinghouse, WIPP*

P.15 Nuclear D&D Waste: Minimizing the Waste Disposal Dilemma. *B. Poff and S. W. Duce; IT Corporation, Knoxville, TN*

P.16 Decommissioning a Commercial Facility Contaminated with NORM. *D. Williams and S. Duce; IT Corporation, Knoxville, TN*

P.17 Chemical Destruction/Oxidation Treatment of Mixed Low Level Waste at RAMP Industries Site. *K. D. Anderson and K. Niswonger; Environmental Chemical Corporation and Colorado Department of Public Health*

Operational Health Physics

P.18 The Tri-Laboratory Health Physics Measurements Working Group. *K. R. Alvar, K. D. Dinnel and R. A. Failor; Los Alamos National Laboratory, Lawrence Berkeley National Laboratory and Lawrence Livermore National Laboratory*

P.19 Implementing a Worldwide Non-Ionizing Radiation Safety Program. *T. W. LaVake, J. Van Houten; Johnson & Johnson*

P.20 Contractor Radiation Safety. *R. D. Ice, R. D. Ice, E. Jawdeh and J. Strydom; Georgia Institute of Technology and C. H. Guernsey and Company*

Monday

Environmental

P.21 The Effect of pH on Plutonium(V) Transport through a Sandy Atlantic Coastal Soil in a Low Carbonate Environment. *B.W. Gibbs, R. A. Fjeld and S. M. Serkiz; Clemson University and Westinghouse Savannah River Company*

P.22 Characterization of Thorium in Soil at the Interservice Nuclear Weapons School Sites. *R. A. August, M. E. Nelson and M. J. Harper; NRL and US Naval Academy*

P.23 Site Characterization using the Global Positioning Radiometric Scanner System. *K. C. Wright and F. L. Webber; Lockheed Martin Idaho Technologies Company*

P.24 Comparison of External Exposure Model in RESRAD Family of Codes with MCNP Computations. *S. Kamboj, D. LePoire and C. Yu; Argonne National Laboratory*

Medical Health Physics

P.25 Radiation Quality of ISO Standard X-Rays. *J. Chen; Bubble Technology Industries, Canada*

Computer Applications

P.26 A Methodology for Estimating Radiation Exposures to Tritium in Buildings. *J.-J. Cheng, D. LePoire, C. Yu and S. Kamboj; Argonne National Laboratory*

P.27 Electronically Tracking and Trending Radiation Occurrences. *J. L. Miller and K. L. Classic; Mayo Foundation*

P.28 Screening of Abnormal LiF:Mg,Cu,P Glow Curves. *N. Bautro, J. Cassata and J. E. Rotunda; John R. Marsh Cancer Center, National Naval Medical Center and Bicron•NE*

P.29 Automatic Identification and Quantification of Radioisotopes from Gamma-Ray Spectra Using Abductive Networks. *R. E. Abdel-Aal and M. N. Al-Haddad; King Fahd University of Petroleum and Minerals, Saudi Arabia*

Dosimetry: Internal/External

P.30 Dosimetric Characterization of Bicron•NE's New LiF:Mg,Cu,P Materials. *M. R. Ramlo, J. Fellinger, K. J. Velbeck and P. Tomlins; Bicron•NE*

P.31 Radiation Protection with Grape Seed Extract. *V. K. Lanka, M. S. Goddu, R. W. Howell and D. V. Rao; University of Medicine and Dentistry of New Jersey*

P.32 Bayesian Analysis of Dicentric Chromosome Aberrations after in vitro Exposure to X-rays. *P. G. Groer; University of Tennessee, Knoxville*

P.33 NMR Microimaging of Trabecular Bone: A New Tool for the Development of Bone Dosimetry Models. *W. E. Bolch, D. W. Jokisch, P. W. Patton, L. G. Bouchet, D. Rajon, B. A. Inglis, and S. L. Myers.; University of Florida*

P.34 New Three-Dimensional Dosimetric Model of Trabecular Bone. *L. G. Bouchet, W. E. Bolch, R. W. Howell and D. V. Rao; University of Florida and UMDNJ - New Jersey Medical School*

Monday

P.35 Design, Fabrication of a New Anthropometric Calibration Phantom for in vivo Measurement of Bone Seeking Radionuclides in the Knee. *H. B. Spitz and J. Lodwick; University of Cincinnati*

P.36 Dose from Organically Bound Tritium in a Population Residing Near a Heavy-Water Research Reactor Facility. *T. G. Kotzer and A. Trivedi; AECL, Canada*

P.37 In-vivo Bioassay Protocol for Internally Deposited I-125 Using High Resolution CdZnTe Detectors. *M. W. Ocasio and P. J. Papin; VA Medical Center, San Diego and San Diego State University*

P.38 Uncertainties in Doses from Ingestion of ^{137}Cs, ^{90}Sr, ^{60}Co, ^{106}Ru, and ^{131}I. *A. I. Apostoaei, C. J. Lewis, J. H. Hammonds and F. O. Hoffman; SENES Oak Ridge Inc. and University of Texas, Knoxville*

P.39 A Six-Stage Hybrid Biokinetic Model to Quantify ^{220}Rn Exhalation Following an Intake of Thorium Oxide. *R. J. Traub, J. R. Johnson and T. P. Lynch; Battelle, Pacific Northwest Division*

P.40 Determination of Plutonium-240/239 Ratios in United States Transuranium and Uranium Registries Cases Using High Resolution Alpha Spectrometry. *S. P. LaMont, S. E. Glover and R. H. Filby; Washington State University*

Accelerator

P.41 Cancelled

P.42 The Investigation of Environmental Radiological Vulnerabilities at Fermilab. *J. D. Cossairt and R. L. Walton; Fermilab*

Risk Analysis

P.43 Organ-specific Risk Coefficients for Estimating Excess Lifetime Risk of Cancer Incidence. *A. I. Apostoaei, F. O. Hoffman and J. S. Hammonds; SENES Oak Ridge Inc. and University of Tennessee, Knoxville*

P.44 Lessons Learned During Comparison of Two Contaminant Transport and Dose Modeling Codes. *P. S. Morris and A. E. Hechanova; Harry Reid Center for Environmental Studies*

Works-in-Progress

P.45 Methodologies for Evaluating Radiological Doses Associated with Disposal of NORM Wastes in a Non-hazardous Landfill. *J. J. Arnish, D. L. Blunt, K. P. Smith and G. P. Willliams; Argonne National Laboratory*

P.46 Data Collection Methodologies to Support a Risk Assessment of On-Site Treatment and Injection of Oilfield NORM. *J. J. Arnish, D. L. Blunt, K. P. Smith and G. P. Williams; Argonne National Laboratory*

P.47 Uranium Uptake by Commonly Grown Vegetables in Northern New Mexico and Assessment of Potential Doses and Risks to Human Consumers. *A. C. Hayes, P. R. Fresquez and F. W. Whicker; Los Alamos National Laboratory and Colorado State University*

Monday

P.48 Tritium and Plutonium in Waters from the Bering and Chukchi Seas. *E. R. Landa, D. M. Beals, J. E. Halverson, R. L. Michel and G. R. Cefus; US Geological Survey, Reston, VA and Menlo Park, CA and Westinghouse Savannah River Co.*

P.49 Calibrating a Sodium Iodide Gamma Ray Spectrometer for Dose Rate. *R. L. Grasty and B. Walters; Exploranium G.S. Ltd., Canada and National Research Council, Canada*

P.50 A New System to Expedite the Conduct of Alpha or Beta Contamination Surveys with 100% Coverage on Large Exterior and Interior Surfaces. *C. R. Flynn, M. S. Blair and B. D. Keele; Chemrad Tennessee Corporation*

P.51 Decommissioning of a Contaminated Sump at the University of Cincinnati. *V. Morris and M. Burba; University of Cincinnati*

P.52 Independent Assessment of the Hazards of Proposed Plutonium Processing Facilities at the Pantex Plant. *J. M. Thompson, E. A. Thompson and I. S. Hamilton; Texas A&M University*

P.53 Potential Agricultural Impacts of Accidents at a Proposed Plutonium Processing Facility at the Pantex Plant. *E. A. Thompson, J. M. Thompson and I. S. Hamilton; Texas A&M University*

P.54 The Compliance Inspection Process in Radiation Safety Operations. *R. Michel and J. A. Lopez; Iowa State University and University of Texas Southwestern Medical Center*

P.55 The Use of Potassium Iodide for Public Protection in the Event of a Severe Nuclear Accident in the United States. *F. J. Congel, T. J. McKenna, A. S. Mohseni and C. A. Willis; US Nuclear Regulatory Commission*

P.56 Medical NBC: Radiological Health Risk Planning and Projection. *A. L. Scott, S. J. Kaeppel, J. W. Collins, D. Collins, M. S. Terpilak, G. A. Falo and R. Reyes; United States Army Center for Health Promotion and Preventive Medicine, Henry M. Jackson Foundation for Medical Research and Oak Ridge Institute for Science and Education*

P.57 A Summary of Radiation Exposures for Patients Undergoing Phototimed Radiographic Examination. *W. K. Chu and R. L. Thacker; University of Nebraska Medical Center*

P.58 Radiation Worker Training for the General Laboratory Environment at San Jose State University. *J. J. Pickering; San Jose State University*

3:00-4:00 PM Room: 101 G/H

MPM-A: Waste Management and Decommissioning

(Oral Session)

Co-Chairs: Cindy Boggs and Jay Maisler

3:00 MPM-A.1
In-Situ Nondestructive Assay Measurements at the ORNL Molten Salt Reactor. *J. A. Chapman, I. G. Gross, E. S. Meyers, L. D. Weems and D. C. Hensley; Oak Ridge National Laboratory*

Monday

3:15 MPM-A.2
Validation of Composite Sampling by Nondestructive Assay Methods. *K. E. Meyer, J. A. Chapman and F. J. Schultz; East Tennessee Technology Park and Oak Ridge National Laboratory*

3:30 MPM-A.3
Records Versus Reality in Remediation of a Mixed Waste Disposal Site. *J.A. Padgett, W. L. Cox and R. M. Fry; NC Division of Radiation Protection*

3:45 MPM-A.4
Derivation and Application of Risk-Based Surface Contamination Release Criteria for a Radiologically Contaminated Building. *R. V. Graham, J. W. Lively and D. M. Smith; US Environmental Protection Agency, Denver, CO, MACTEC-ERS and TMSS, Inc.*

3:00-5:30 PM Room: 101 C/D/E

MPM-B: Special Session: Radiation Safety Program Management - Lessons Learned from Program Experiences

(Oral Session)

Chair: Keith Dinger and Chuck Roessler

3:00 MPM-B
Introduction: Managing a Routine Radiation Safety Program. A Summary Overview of the 1998 Summer School. *C. E. Roessler; Elysian, MN*

3:15 MPM-B.1
Lessons Learned from Managing an Occupational Radiation Safety Program with Allegations of Increased Radiation Worker Deaths - The Portsmouth Naval Shipyard Experience. *K. H. Dinger; Somersworth, NH*

3:30 MPM-B.2
Lessons Learned from Managing a Radiation Safety Program with a Highly Publicized Radioactive Material Intake by a Researcher - The MIT Experience. *F. X. Massé; Massachusetts Institute of Technology*

3:45 MPM-B.3
Lessons Learned from Managing an Environmental Radiation Safety Program Amidst Concerns of Off-Site Tritium Releases - The Brookhaven Experience. *R. Casey; Brookhaven Nationl Laboratory*

4:00 Break

4:30 MPM-B.4
Challenges of Managing an Effective Radiation Safety Program in the Face of Deregulation, Downsizing, and Decommissioning - The Nuclear Utility Experience. *D. W. Miller; Illinois Power Company*

4:45 MPM-B.5
Lessons Learned about Managing a Radiation Safety Program for the Mitigation of Litigation - The Radiation Litigation Experience. *D. Wiedis; Jose and Wiedis*

5:00 Panel Session – All Presenters

Monday

3:00-5:30 PM Room: 101 I/J

MPM-C: Radon Section Session: "Radon a Problem Solved"

(Oral Session)

Co-Chairs: David Hintenlang and Carl Gogolak

3:00 MPM-C.1
^{222}Rn, A Problem Solved - The Issue of Measurements. *N. H. Harley; New York University School of Medicine*

3:30 MPM-C.2
Adventures in Radon Politics: A City Considers a Radon Ordinance. *J. A. Johnson and L. Devocelle; Shephard Miller, Inc. and City of Fort Collins*

4:00 MPM-C.3
Radon Mitigation in Industrial Settings. *A. G. Scott; Radiation Protection Service, Ontario Ministry of Labor, Canada*

4:30 Panel Discussion on BIER VI

5:30-6:30 Radon Section Meeting

3:00 - 5:15 PM Room: 101 A/B

MPM-D: Power Reactor Section Session: Radiological Protection Management Experience at Nuclear Power Plants

(Oral Session)

Chair: Rick Doty

3:00 MPM-D.1
NARTC Expert Group Evaluation of a World Class Performer: TVO Nuclear Power Station, Finland. *D. DiCello and R. Farrell; Limerick Nuclear Power Station and Point Beach Nuclear Power Station*

3:15 MPM-D.2
Occupational Dose Trends for PWR's and BWR's 1978-1996 In-Service Inspection. *M. J. Hulin and D. W. Miller; North American Regional Technical Center, ISOE*

3:30 MPM-D.3
Update on the International System on Occupational Exposure (ISOE). *D. W. Miller and R. L. Doty; North American Regional Technical Center, ISOE*

3:45 MPM-D.4
Year 2000 Impacts on Radiation Protection Access Control and Dosimetry Recordkeeping Systems. *W. Green and D. W. Miller; Clinton Power Station*

4:00 Break

4:30 MPM-D.5
UNSCEAR Effluent Database Standardization Initiative for US PWR's and BWR's. *A. J. Smith and D. W. Miller; University of Illinois*

4:45 MPM-D.6
Secondary Education Teacher Workshop GM Survey Meter Distribution Initiative. *K. Meriweather and D. W. Miller; North American Regional Technical Center, ISOE*

5:00 MPM-D.7
Innovations in Emergency Environmental Monitoring at a Nuclear Power Station. *R. L. Doty and S. L. Ingram; PP&L, Inc.*

5:15-6:15 Power Reactor Section Meeting

Tuesday

7:15-8:15 AM Room: 101 G/H

CEL-3 BIER VI Report Update. *Ken Mossman; Arizona State University*

7:15-8:15 AM Room: 101 A/B

CEL-4 Radiotherapy with Internal Emitters - Current Trends and Challenges. *Michael Stabin; Oak Ridge Associated University*

8:30 AM -Noon Room: 101 G/H

TAM-A: Student I

(Oral/Poster Session)

Co-Chairs: Linnea Wahl and Tom Gesell

NOTE: All student presenters will give a 2 minute oral summary of their presentation before poster viewing begins.

TAM-A.1 One-Year Comparison of Three Methods for Measuring Environmental Radiation. *K. D. Moser, D. W. Walker and T. F. Gesell; Idaho State University and INEEL Oversight Program*

TAM-A.2 Preparation of Sequential Extracts for Plutonium Analysis by Alpha Spectrometry. *W. C. Nicosia and W. H. Johnson; University of Nevada - Las Vegas*

TAM-A.3 Mathematical Modeling of Radionuclide Transport in the Subsurface. *C. S. Sochor, T. A. DeVol, R. A. Fjeld and F. J. Molz; Clemson University*

TAM-A.4 Prediction of Uranium Fraction Sorbed for SRS Soils Based upon Fe and Al Concentrations. *M. J. Emley, S. Serkiz and R. A. Fjeld; Clemson University and Westinghouse Savannah River Company*

TAM-A.5 Scintillation Counting for Environmental Monitoring of Krypton-85. *S. A. Kirk, K. J. Hofstetter, T. A. DeVol and J. R. Cadieux; Dames & Moore, Westinghouse Savannah River Company and Clemson University*

TAM-A.6 A Comparison of Fission Product and Plutonium Activity in Desert Washes. *M. M. Davis, W. H. Johnson and M. J. Rudin; University of Nevada - Las Vegas*

TAM-A.7 Ratio of Cs-137 to Pu-239,240 in Reservoir Sediments. *S. J. Goldston, W. H. Johnson and M. J. Rudin; University of Nevada - Las Vegas*

TAM-A.8 Dating Reservoir Sediments using Pb-210 and Cs-137. *S. A. Smith, M. J. Rudin and W. H. Johnson; University of Nevada - Las Vegas*

TAM-A.9 A Non-Invasive Technique for Determining Contaminant Depth in Materials in situ. *E. Naessens and G. Xu; Rensselaer Polytechnic Institute*

TAM-A.10 A Correction Accounting for ^{222}Rn Loss in the Immediate Laboratory Gamma Spectroscopy of Collected Soil Samples. *R. R. Benke and K. J. Kearfott; University of Michigan*

TAM-A.11 Preparation of Soil Thin Sections for Contaminant Distribution Studies. *O. G. Povetko and K. A. Higley; Oregon State University*

Tuesday

TAM-A.12 A Direct Radon Detector. *G. A. Falo; University of Massachusetts-Lowell*

TAM-A.13 Developing a Methodology for Strontium-90 Analysis in Milk using 3M Empore Rad Discs. *K. T. Claver, R. R. Brey, T. F. Gesell and R. Rodriguez; Idaho State University*

TAM-A.14 The Idaho State University Environmental Assessment Laboratory. *P. A. Jenkins, R. R. Brey, L. R. Paulus and K. T. Claver; Idaho State University*

TAM-A.15 Utilization and Effectiveness of ^{222}Rn-Resistant Construction Techniques. *G. C. Cseko, J. E. Watson, Jr. and R. A. Cote; University of North Carolina at Chapel Hill*

TAM-A.16 Human Health Risk Assessment Related to the Consumption of Elk and Deer that Forage Around the Perimeter of a Low-Level Radioactive Waste Disposal Site at Los Alamos National Laboratory. *J. K. Ferenbaugh, P. R. Fresquez, M. H. Ebinger, G. J. Gonzales and P. A. Jordan; Los Alamos National Laboratory and University of Minnesota-Twin Cities*

TAM-A.17 Radon Concentrations Measurements in South-Central Texas Water Supplies. *D. W. Hearnesberger and I. S. Hamilton; Texas A&M University*

TAM-A.18 Development of an Irradiation Treatment Technique for Low-Level Mixed Waste. *O. Gandou, M. King and D. E. Hintenlang; University of Florida*

TAM-A.19 Characterization of Radiolytic Decomposition of Chloroform in Aqueous Solutions for the Treatment of Low-Level Mixed Waste. *M. King, O. Gandou and D. E. Hintenlang; University of Florida*

TAM-A.20 Dose Reconstruction of ^{60}Co Contaminated Window Frames in a Taiwanese School. *K. M. Brock, C. Neumann, K. A. Higley, A. Rossignol and W. P. Chang; Oregon State University*

TAM-A.21 Hormesis Effects in Pinto Beans from ^{60}Co Gamma Radiation. *D. M. Boone, J. F. Higginbotham and K. Higley; Oregon State University*

TAM-A.22 The Treatment of Incoherent Scattering in the EGS4 Photon/Electron Transport Computer Code. *C. M. Marianno; Oregon State University*

TAM-A.23 Polyvinyl Alcohol Film Dyed with Congo Red as a Simple Dose Indicator for Use in Industrial Irradiation Facilities. *L. G. Backstrom, R. R. Brey and F. J. Harmon; Idaho State University*

TAM-A.24 Investigation of Radiation Doses Lethal to Virus Populations. *K. R. Marlow, R. R. Brey, L. D. Farrell, J. F. Harmon and R. D. Spall; Idaho State University*

TAM-A.25 The Role of DNA Topology in Strand Breaks and Computer Modeling. *B. J. Morabito, R. D. Ice, W. E. Bolch and R. D. Schinazi; University of Florida, Georgia Institute of Technology and Emory University/VA Medical Center*

Tuesday

TAM-A.26 Landmine Identification Using Lateral Migration Radiography. *J. Howley, Z. Su, E. Dugan and A. Jacobs; University of Florida*

TAM-A.27 A Preliminary Assessment of Relative Societal Risk for Missions Proposed for the USDOE Pantex Plant. *K. R. Krieger, I. S. Hamilton, J. M. Thompson and E. A. Thompson; Texas A&M University*

8:30 AM-Noon Room: 101 C/D/E

TAM-B: AAHP Session: A Summary of the Wingspread Conference - Part 1

(Oral Session)

Creating a Strategy for Science-Based National Policy: Addressing Conflicting Views on the Health Risks of Low-Level Ionizing Radiation

Chair: Jerome B. Martin

8:30 **TAM-B.1**
Introduction: Objectives of the Summary. *R. O. McClellan; Chemical Industry Institute of Toxicology*

8:45 **TAM-B.2**
Summary of Session I: Integrating Science and Policy to Establish Risk Regulations That Protect Human Health. *R. O. McClellan; Chemical Industry Institute of Toxicology*

9:15 **TAM-B.3**
Summary of Session II: The Science Base. *G. S. Roessler and M. Goldman; Elysian, MN and University of California, Davis*

10:00 **Break**

10:15 **TAM-B.4**
Summary of Session III: Is the Linear, No Threshold Dose-Response Relationship Appropriate for Regulating Low-Dose Radiation? *K. L. Mossman and R. H. Clarke; Arizona State University and NRPB, UK*

11:15 **TAM-B.5**
Summary of Breakout Groups: Key Questions 1, 2, and 3. *R. J. Vetter; Mayo Foundation*

11:30 **Question & Answer Period with Panel of Morning Session Speakers**

Noon-1:30 PM
AAHP Awards Lunch - See page 8 for additional information.

8:30 - 11:00 AM Room: 101 I/J

TAM-C: Radon

(Oral Session)

Co-Chairs: Barry Berven and Phil Kearney

8:30 **TAM-C.1**
^{222}Rn Decay Products as Tracers of Indoor/Outdoor Aerosol Particles. *N. H. Harley, P. Chittaporn, P. Perry, I. M. Fisenne; New York University School of Medicine, and US Department of Energy EML, New York, NY*

8:45 **TAM-C.2**
Investigation of Radon Concentrations in Lithuanian Karst Region. *G. Morkunas and D. Michelevicius; Radiation Protection Centre, Lithuania and Lithuanian Geological Survey*

9:00 **TAM-C.3**
Assay of Radon-222 in Potable Water from Some Wells in Hail Region of Saudi Arabia. *A. M. Mamoon, W. H. Abulfaraj, A. R. Kinsara and M. A. Sohsah; King Abdulaziz University, Saudi Arabia*

Tuesday

9:15 **TAM-C.4**
^{222}Rn, Decay Product Dose During Showering. *P. Chittaporn and N. H. Harley; New York University School of Medicine*

9:30 **Break**

10:00 **TAM-C.5**
A Model for Relating Current Levels of ^{210}Pb in Bone of Former Uranium Miners to Occupational Exposures to Short-Lived Radon Progeny. *R. W. Leggett, G. D. Kerr, K. F. Eckerman and R. A. Guilmette; Oak Ridge National Laboratory, and Lovelace Respiratory Research Institute*

10:15 **TAM-C.6**
^{210}Pb as a Biomarker of Exposure of Uranium Miners to Radon Progeny - 30 Years Too Late? *R. A. Guilmette, M. B. Snipes, W. E. Lambert, G. R. Laurer, R. W. Leggett, T. A. Coons and F. D. Gilliland; Lovelace Respiratory Research Institute, University of New Mexico School of Medicine, New York University Institute of Environmental Medicine, and Oak Ridge National Laboratory*

10:30 **TAM-C.7**
Blind Testing of State Certified Alpha Track and Charcoal Laboratories by the Commonwealth of Pennsylvania. *R. K. Lewis; Pennsylvania Department of Environmental Protection*

10:45 **TAM-C.8**
Development of a Radon 222 Sealant in a Surrogate for Use at Fernald Silo Waste Site. *S. Boddeker, W. E. Bolch and B. Warren; University of Florida, and Perma-Fix*

8:30-10:30 AM Room: 101 A/B

TAM-D: Accelerator Section Session
(Oral Session)

Chairs: Steve Musolino

8:30 **TAM-D.1**
The Fermilab Neutrinos at the Main Injector (NUMI) Project. *J. D. Cossairt; Fermilab*

9:00 **TAM-D.2**
The Health Physics of the Accelerator Production of Tritium (APT) Accelerator. *L. S. Walker; Los Alamos National Laboratory*

9:30 **Break**

10:00 **TAM-D.3**
H. Wade Patterson 1924-1997 – The Man and His Contribution to Radiological Protection. *R. H. Thomas; Lawrence Livermore National Laboratory*

10:30-11:30 **Accelerator Section Meeting**

Tuesday

12:15-2:15 PM PEP Program

2:30 - 5:00 PM Room: 101 G/H

TPM-A: Student II
(Oral/Poster Session)

Co-Chairs: Kathy Higley and Toshihide Ushino

NOTE: All student presenters will give a 2 minute oral summary of their presentation before poster viewing begins.

TPM-A.1 Organ Doses for Children Undergoing Diagnostic X-Ray Procedures. *R. A. Reyes, W. E. Bolch, L. G. Bouchet and K. Hintenlang; University of Florida*

TPM-A.2 The Intercomparison and Standardization of the Anthropomorphic Phantoms for Monte-Carlo Simulations. *T. C. Chao and G. Xu; Rensselaer Polytechnic Institute*

TPM-A.3 Construction and Usage of a Phantom for Classroom Purposes. *S. Menn and K. Higley; Oregon State University*

TPM-A.4 Measurement of Organ Doses for Pediatric Patients Undergoing CT Examinations. *K. A. Johnson and D. Hintenlang; University of Florida*

TPM-A.5 Practical Use of MOSFET Dosimeters for Monitoring Radiation Dose Pediatric for Cardiac Catheterization Patients. *M. A. Tressler and D. E. Hintenlang; University of Florida*

TPM-A.6 A New Mathematical Model of the Kidney for Use in Suborgan Dosimetry. *P. Blanco, L. G. Bouchet, D. Rajon and W. E. Bolch; University of Florida*

TPM-A.7 Assessment of Potential Changes to the Microarchitecture of Trabecular Bone under Sample Freezing and Thawing. *P. W. Patton, D. W. Jokisch, L. G. Bouchet, D. A. Rajon and W. E. Bolch; University of Florida*

TPM-A.8 Methods for Characterizing the Geometry of Trabecular Regions of the Skeleton for Use in Internal Dosimetry. *D. W. Jokisch, P. Patton, L. Bouchet, D. A. Rajon and W. E. Bolch; University of Florida*

TPM-A.9 Effects of Atherosclerotic Plaque Composition on the 3D Dose Distribution from a P-32 Radioactive Stent. *V. Sehgal, D. Rajon, L. Bouchet and W. E. Bolch; University of Florida*

TPM-A.10 Comparison of Angular "Free-in-Air" and "Tissue-Equivalent Phantom" Response Measurements in p-MOSFET Dosimeters. *B. D. Pomije, M. A. Tressler, W. E. Bolch and D. E. Hintenlang; University of Florida*

TPM-A.11 Interleukin-1 Promoter Activation by Ionizing Radiation is Mediated by Nuclear Factor - κB. *R. D. Hunt, M. Natarajan, S. Mohan, M. Meltz and I. S. Hamilton; Texas A&M University and The University of Texas Health Science Center at San Antonio*

TPM-A.12 Cancelled

TPM-A.13 Optimization of Photon Response for a LiF TLD. *R. C. Carnell; US Naval Academy*

TPM-A.14 Average Beta Energy Estimation. *G. Gibbons, R. R. Brey, L. Paulus, K. Claver and P. Jenkins; Idaho State University*

Tuesday

TPM-A.15 Photon Activation Analysis of Iodine-129. *T. D. Henderson, F. J. Harmon and R. R. Brey; Idaho State University*

TPM-A.16 Electron Deposited Doses in New Mathematical Models for Internal Dosimetry. *D. Rajon, P. Blanco, L. Bouchet and W. E. Bolch; University of Florida*

TPM-A.17 Rocky Flats Neutron Dose Assessment. *S. Stanfield and T. Borak; Colorado State University*

TPM-A.18 Monte Carlo Calculation of the Energy Deposition of Correlated Electrons from 1 MEV Alpha Particles. *K. R. DePriest and L. A. Braby; Texas A&M University*

TPM-A.19 Using Historical Personnel Dosimetry Data as the Basis for Monitoring Determinations. *J. R. McCrary, I. S. Hamilton and R. J. Emery; Texas A&M University and University of Texas-Houston Health Science Center*

TPM-A.20 Use of Two Dosimeters for Better Estimation of Effective Dose Equivalent. *C. H. Kim, W. D. Reece and J. W. Poston, Sr; Texas A&M University*

1:30 -5:00 PM Room: 101 C/D/E

TPM-B: AAHP Session: A Summary of the Wingspread Conference - Part 2

(Oral Session)

Creating a Strategy for Science-Based National Policy: Addressing Conflicting Views on the Health Risks of Low-Level Ionizing Radiation

Chair: Jerome B. Martin

1:30 TPM-B.1
Summary of Session IV: Context for Development of Policy. *J. W. Baum; Brookhaven National Lab*

2:00 TPM-B.2
Summary of Breakout Groups: Questions 4 and 5. *P. L. Ziemer; Purdue University*

2:15 TPM-B.3
Summary of Session V: Needs of Legislators. *M. A. Apple; CSSP*

2:45 TPM-B.4
Summary of Session VI: Perspectives of the Regulators. *J. S. Puskin; US Environmental Protection Agency*

3:15 Break

3:30 TPM-B.5
Summary of Breakout Groups: Questions 6, 7, and 8. *L. M. Muntzing; Morgan, Lewis & Bockius*

3:45 TPM-B.6
Summary of Session VII: Synthesis - What Can We Generally Agree On. *R. O. McClellan; Chemical Industry Institute of Toxicology*

4:15 Panel Discussion: The Path Forward. *M. A. Apple, R. H. Clarke, M. Goldman, R. O. McClellan and L. M. Muntzing; CSSP, NRPB, University of California, Davis, Chemical Industry Institute of Toxicology and Morgan, Lewis and Bockius*

5:00 Open Meeting of the American Academy of Health Physics. ***R. L. Kathren; President***

Tuesday

2:30-3:30 PM Room: 101 I/J

TPM-C: RSO Section Session

(Oral Session)

Co-Chairs: Bob Zoon and Ray Johnson

2:30 TPM-C.1
Positioning for Public Acceptance of Radiation Safety. *R. Johnson, Jr.; CSI-Radiation Safety Training*

2:45 TPM-C.2
Criteria for the Assignment of Personnel Dosimetry at a Large Biomedical Research Facility. *M. A. Noska, D. A. Carter and S. W. Googins; National Institutes of Health*

3:00 TPM-C.3
Development of a Web Based Radioactive Material Approval and Purchasing Program. *J. A. Hanlon, J. P. Ring and K. M. Dilwali; Harvard University*

3:15 TPM-C.4
Implementation of an Intranet Based Refresher Training Program. *G. Sturchio and M. Bernstein; Merck Research Laboratories*

3:30 BREAK

4:00 RSO Section Meeting and Discussion on Regulatory Burden

2:30 - 4:30 PM Room: 101 A/B

TPM-D: Environmental

(Oral Session)

Co-Chairs: Fred Monette and Floyd Galpin

2:30 TPM-D.1
Influence of Air Pollutants in the Activity Size Distribution of Ambient Aerosols. *C. Papastefanou; Aristotle University of Thessaloniki, Greece*

2:45 TPM-D.2
Routine Release Atmospheric Dose Calculations for Accelerator Production of Tritium Environmental Impact Statement. *A. A. Simpkins; Westinghouse Savannah River Company*

3:00 TPM-D.3
Comparative Results of Four Sr-90 Groundwater Analytical Methods. *S. C. Scarpitta, J. Odin-McCabe, R. Gaschott, A. Meir and E. Klug; Brookhaven National Laboratory*

3:15 Break

3:45 TPM-D.4
Radioactive Material Disposal to Sewers: What Smells? *E. A. Stetar and M. L. Miller; Performance Technology Group, Inc. and Roy F. Weston, Inc.*

4:00 TPM-D.5
The Fate of Radionuclides in Plastic Lined Ponds and Potential Dose to Persons Consuming Waterfowl from those Ponds. *R. W. Warren; Environmental Science and Research Foundation, Inc.*

4:15 TPM-D.6
Components of Total Propagated Uncertainty in SR-89 and SR-90 Measurements used for Evaluating Interlaboratory Comparison Results for Environmental Monitoring Programs. *M. C. Nichols and B. Kahn; Georgia Power Company, and Georgia Institute of Technology*

Wednesday

7:15-8:15 AM Room: 101 G/H

CEL-5 Applying Radiation Safety's Approach to Create a Comprehensive Reproductive Health Program. *Robert Emery; University of Texas at Houston*

7:15-8:15 AM Room: 101 A/B

CEL-6 False Alarms, True Alarms, and Statistics: Correct Usage of Decision Level and Minimum Detactable Amount. *Daniel Strom; Pacific Northwest National Laboratory*

8:30 - 11:30 AM Room: 101 G/H

WAM-A: Risk Analysis

(Oral Session)

Co-Chairs: John Frazier and Janet Johnson

8:30 **WAM-A.1**
Quantitative Evaluation of Contamination Consequences (QECC). *D. J. Strom, C. R. Watson and P. S. Stansbury; Pacific Northwest National Laboratory*

8:45 **WAM-A.2**
Dose Assessment Methodology for Alternative Land Uses of Plutonium Contaminated Soil. *S. R. Adams; IT Corporation, Las Vegas, NV*

9:00 **WAM-A.3**
A Methodology for Dose and Risk Calculations that Addresses Stakeholders' Concerns. *S. Pensinger and A. E. Hechanova; University of Nevada - Las Vegas*

9:15 **WAM-A.4**
Systematic Assessment of Exemptions for Source and Byproduct Materials. *D. C. Kocher, G. D. Kerr, J. S. Bogard, P. A. Scofield, F. R. O'Donnell, S. J. Cotter and C. R. Mattsen; Oak Ridge National Laboratory and US Nuclear Regulatory Commission, Washington, DC*

9:30 **WAM-A.5**
Environmental Assessment for the Manufacture and Shipment of Mixed Oxide Reactor Fuel from the United States to Canada. *R. C. Rangel; Los Alamos National Laboratory*

WAM-A.6 Cancelled

9:45 **Break**

10:15 **WAM-A.7**
A Review of Biologically and Physically Related Dosimetric Data for Hiroshima. *G. D. Kerr; Oak Ridge National Laboratory*

10:30 **WAM-A.8**
Dose-Response Shapes: Linear Excess Relative Risk or Lognormal Absolute Risk. *A. Brodsky; SAIC*

10:45 **WAM-A.9**
Health Physics Implications of the Rocketdyne Worker Study. *O. G. Raabe; University of California, Davis*

11:00 **WAM-A.10**
Update on Test of the Linear-No Threshold Theory by Lung Cancer Rates vs Radon Levels in US Counties. *B. L. Cohen; University of Pittsburgh*

11:15 **WAM-A.11**
An Econmically Justifiable Approach to Cost-Benefit Analysis and Optimization. *B. K. Holland and C. A. Willis; Georgetown University*

Wednesday

8:30 -10:45 AM Room: 101 C/D/E

WAM-B: Special Session: Radioactive Materials in the Public Domain

(Oral Session)

Co-Chairs: James G. Yusko and W. P. Chang

8:30 **WAM-B.1**
Radioactive Sources in the Public Domain - The Future (?). *J. G. Yusko; Pennsylvania Department of Environmental Resources*

8:45 **WAM-B.2**
Radioactive Sources in the Public Domain - An Historical Perspective. *J. O. Lubenau; US Nuclear Regulatory Commission, Rockville, MD*

9:15 **Break**

9:45 **WAM-B.3**
The Fate of Radioactive Materials when Melted in a Metal Making Furnace. *A. LaMastra; Health Physics Associates, Inc.*

10:15 **WAM-B.4**
^{60}Co Contamination in Recycled Steel Resulting in Widespread Civilian Radiation Exposure in Taiwan. *W. P. Chang; National Yang Ming University Medical School, Taipei, Taiwan*

8:30 - 11:00 AM Room: 101 I/J

WAM-C: Decommissioning Section Session

(Oral Session)

Co-Chairs: Eric W. Abelquist and Pat LaFrate

8:30 **WAM-C.1**
NRC Regulatory Guide on Demonstrating Compliance with the Radiological Criteria for License Termination. *S. A. McGuire; US Nuclear Regulatory Commission, Washington, DC*

9:00 **WAM-C.2**
Optimization (ALARA) Analysis for the Environmental Remediation of a Hazardous Waste Management Facility. *B. J. Dionne, S. C. Morris III, J. W. Baum, P. D. Moskowitz, S. Masciulli and C. Yu; Brookhaven National Laboratory, ABB Combustion Engineering, Inc. and Argonne National Laboratory*

9:15 **WAM-C.3**
Implementing NUREG-1507 Guidance for Surface Activity Assessment at an Enriched Uranium Facility. *D. R. Quayle; Oak Ridge Institute for Science and Education*

9:30 **Break**

10:00 **WAM-C.4**
Surface Activity Assessment Using MARSSIM Guidance. *E. W. Abelquist; Oak Ridge Institute for Science and Education*

10:15 **WAM-C.5**
Development of ANSI N13.12 Standards on Release of Surface or Volume Sources. *W. E. Kennedy, Jr. and S. Y. Chen; Dade Moeller & Associates, Inc. and Argonne National Laboratory*

10:30 **WAM-C.6**
Decommissioning Experience at Los Alamos National Laboratory. *P. LaFrate; Vermont Yankee Nuclear Power Plant*

11:00-Noon **Decommissioning Section Meeting**

Wednesday

8:30 - 10:30 AM Room: 101 A/B

WAM-D: Medical Health Physics

(Oral Session)

Co-Chairs: Jean St. Germain and Ken Miller

8:30 **WAM-D.1**
Report of the American College of Cardiology on Doses for Angiography. *M. E. Moore; Moorerad, Inc.*

8:45 **WAM-D.2**
Thirty Years of Brachytherapy Experience at Memorial Sloan-Kettering. *J. St. Germain; Memorial Sloan-Kettering*

9:00 **WAM-D.3**
Utilization of the Capintec Beta C™ Dose Calibrator for Activity Measurements of Beta Emitting Isotopes. *A. D. Amundson and T. L. Mays; Mayo Foundation*

9:15 **WAM-D.4**
Radiation Safety Functions and Staffing Levels in Nuclear Medicine Departments. *J.-C. Dehmel; S. Cohen & Associates, Inc.*

9:30 **Break**

10:00 **WAM-D.5**
Patient Dose Monitoring in Interventional Radiology. *B. A. Schueler, J. P. Taubel and M. A. McKusick; Mayo Clinic*

10:15 **WAM-D.6**
Update on Patient Radiation Doses at a Large Tertiary Care Medical Center. *L. K. Ngutter, J. M. Kofler and R. J. Vetter; Mayo Foundation*

10:30-11:30 **Medical Section Meeting**

12:15-2:15 PM PEP Program

2:30 - 5:00 PM Room: 101 G/H

WPM-A: NCRP

(Oral Session)

Chair: Charles Meinhold

2:30 **WPM-A.1**
NCRP Report No. 127 Operational Radiation Safety Program and Activities of Scientific Committee 46. *K. R. Kase; Stanford Linear Accelerator Center*

3:00 **WPM-A.2**
Radiological Protection Guidelines for Particle Accelerator Facilities: The Work of Scientific Committee 46-8. *R. H. Thomas; Lawrence Livermore National Laboratory*

3:30 **Break**

4:00 **WPM-A.3**
Assessment of Occupational Dose from Internal Emitters. *D. R. Fisher; A. R. Benedetto, C. D. Berger, J. W. Poston, Sr. and K.W. Skrable; Pacific Northwest National Laboratory, Kentucky Chandler Medical Center, Integrated Environmental Management, Inc., Texas A&M University and Skrable Enterprises*

4:30 **WPM-A.4**
NCRP Scientific Committee 46-13 Design of Facilities for Medical Radiation Therapy. *E. Kearsley; NCRP Staff Liaison*

Wednesday

2:30 - 4:45 PM Room: 101 C/D/E

WPM-B: Operational Health Physics

(Oral Session)

Co-Chairs: Charlie Willis and Ed Scalsky

2:30 **WPM-B.1**
Ventilation and Concrete Protective-Coating Requirements to Control Tritium Sorption and Retention in the National Ignition Facility Structural Materials. *M. S. Singh, S. J. Brereton, T. C. Reitz and J. M. Yatabe; Lawrence Livermore National Laboratory*

2:45 **WPM-B.2**
Tritium Source Accountability Following the Flood of a Bomb Tunnel. *D. L. Koelker and W. H. Johnson; Defense Special Weapons Agency and University of Nevada - Las Vegas*

3:00 **WPM-B.3**
Radiological Experiences in the Rheological Studies of Silo Materials. *S. K. Dua, R. Burton, F. Mao, S. Vallidum, J. Boudreaux, M. A. Ebadian and D. Daniels; Florida International University and Fluor D. Fernald*

3:15 **WPM-B.4**
Problems with Collective Dose as a Performance Measure for Occupational Radiation Protection Programs. *R. Harty, E. E. Hickey, D. J. Strom, J. B. Martin and R. L. Kathren; Pacific Northwest National Laboratory and Washington State University-Tri Cities*

3:30 **Break**

4:00 **WPM-B.5**
Lessons Learned and Developments Made Implementing the Radnet Protocol. *B. Rees and K. Olson; Los Alamos National Laboratory*

4:15 **WPM-B.6**
Interaction of ELF Electromagnetic Fields with Living Bodies. *M. A. Abdallah, S. A. Mahmoud and H. I. Anis; Zagazig University, Egypt, Ministry of Electricity, Egypt and Cairo University, Egypt*

4:30 **WPM-B.7**
Exposures of Police Officers to Extremely Low Frequency Magnetic Fields (ELF MF). *F. Akbar-Khanzadeh and T. A. Graham; Medical College of Ohio*

2:30 - 4:30 PM Room: 101 I/J

WPM-C: Environmental Section Session

(Oral Session)

Co-Chairs: Ernest Antonio and Craig Little

2:30 **WPM-C.1**
Monitoring of Radioactive Contamination and Radiation Exposure in the Environment in Germany. *A. Bayer; Federal Office for Radiation Protection, Germany*

3:00 **WPM-C.2**
The Maralinga Rehabilitation Project. *B. W. Church and P J. Davoren; BC Enterprises, Inc. and Government of Australia*

3:30 **Break**

4:00 **WPM-C.3**
A Comparison of Radiological Dose-Rate Models for Ecological Risk Assessment. *D. G. Bowen, L Meyers-Schöne and S. N. Hoier; IT Corporation, Albuquerque, NM and Sandia National Laboratories*

4:30-5:30 **Environmental Section Meeting**

2:30 -5:00 PM Room: 101 A/B

WPM-D: Dosimetry: Internal and External

(Oral Session)

Co-Chairs: Paul M. DeLuca, Jr. and Mary J. Lewis

2:30 **WPM-D.1**
Evolution in DOE Personnel Dosimetry Practices. *J. J. Fix; Pacific Northwest National Laboratory*

2:45 **WPM-D.2**
The DOELAP Accreditation Program for Radiobioassay Laboratories. *R. M. Loesch, J. C. McDonald and F. M. Cummings; US Department of Energy, Germantown, MD and Idaho Falls, ID and Pacific Northwest National Laboratory*

3:00 **WPM-D.3**
Determination of Neutron Backscatter Factors for Several Calibration Phantoms. *R. J. Traub, J. C. McDonald and R. K. Piper; Pacific Northwest National Laboratory*

3:15 **WPM-D.4**
Dose Assessment for External Exposure from Inhomogeneous Plane Sources of Co-60 Contaminated Scraps. *S. Y. Tsai and W. P. Chang; National Yang Ming University Medical School*

3:30 **Break**

4:00 **WPM-D.5**
Calciphylactic Hypersensitivity to Alpha Particles? *J. H. Stebbings; Midwest Epidemiology Associates*

4:15 **WPM-D.6**
Practical Decision Levels for an Operational Bioassay Program. *C. A. Potter; Sandia National Laboratories*

4:30 **WPM-D.7**
New Implications for ^{137}Cs Whole Body Counting. *E. H. Carbaugh, J. A. MacLellan and D. E. Bihl; Pacific Northwest National Laboratory*

4:45 **WPM-D.8**
Distribution and Dynamics of Tritium after Inhalation of Tritiated Pump Oil. *A. Trivedi; AECL, Canada*

5:00-6:00 PM 101 A/B

HPS Annual Business Meeting

6:00 - 8:00 PM Room: Duluth, Hilton Hotel

WPM-E: Special Session: Aerosol Measurements

(Oral Session)

Chair: Morgan Cox

6:00 **WPM-E.1**
Flow Measurements with Rotameters and Appropriate Corrections. *G. J. Newton, M. Hoover and M. Cox; Lovelace Respiratory Research Institute*

6:15 **WPM-E.2**
Room Airflow Studies Using Sonic Anemometry. *J. J. Whicker, H. Gong, R. G. Morgan, J. C. Rodgers and P. T. Wasiolek; Los Alamos National Laboratory*

6:30 **WPM-E.3**
Novel Techniques for High-Volume Throughput Monitoring of Airborne Radionuclides. *S. Bittenson, K. Patch and F. Becker; TECOGEN*

6:45 **WPM-E.4**
Environmental Testing of the Canberra Alpha Sentry Cam. *M. Koskelo and M. Charland; Canberra*

7:00 **WPM-E.5**
ICARE: A Tool to Know the True Efficiency of Radioactive Aerosol Monitors. *L. Grivaud, S. Faufel and F. Pagliardini; Institut de Protection et de Sûreté Nucléaire, France*

7:15 **WPM-E.6**
Performance Testing of Continuous Air Monitors for Alpha-Emitting Radionuclides. *M. D. Hoover and G. J. Newton; Lovelace Respiratory Research Institute*

7:30 **WPM-E.7**
Currently Applicable Standards for Monitoring and Measuring Radioactive Aerosols. *M. Cox, M. Hoover and G. Newton; Lovelace Respiratory Research Institute*

7:45 **WPM-E.8**
Mixing in Stacks and Ducts to Achieve Compliance with the Proposed Revision to ANSI N13.1. *A. R. McFarland and N. K. Anand; Texas A & M University*

Open Discussion of Air Monitoring Issues.

Thursday

7:15-8:15 AM Room: 101 G/H

CEL-7 The Evidence For and Against the Linear-No-Threshold Theory. *Bernard Cohen; University of Pittsburgh*

7:15-8:15 AM Room: 101 A/B

CEL-8 Upgrading Your Knowledge of Health Physics Use of the Internet or "Spiders and Cookies and Bots - Oh My..." Tales and Tools From Cyberspace. *Bruce Busby; Washington State Department of Health*

8:30-11:30 AM Room: 101 G/H

THAM-A: Special Session: MARSSIM

(Oral Session)

Chair: Colleen Petullo

8:30 THAM-A.1
Final Status Surveys for Background Radionuclides when the DCGLs are Small. *C. V. Gogolak; US Department of Energy EML, New York, NY*

9:30 THAM-A.2
Results of Field Test at a Thorium-Contaminated Site Using MARSSIM Survey Design. *Eric Abelquist; ORISE*

10:30 Break

11:00 Question and Answer Session with Author Agency Representatives

11:30 Government Section Business Meeting

8:30 - 9:45 AM Room: 101 C/D/E

THAM-B: Training and Communication

(Oral Session)

Co-Chairs: Harrison Kerschner and Dick Boyer

8:30 THAM-B.1
Survey Equipment. *G. Harder; University of Florida*

8:45 THAM-B.2
First Line of Safety: Radiological Worker Practical Training. *E. Hochheiser and D. Martini; Fluor Daniel Hanford*

9:00 THAM-B.3
Innovations in Teaching Health Physics: Making It Fun. *K. A. Higley and C. M. Marianno; Oregon State University*

9:15 THAM-B.4
Personnel Training and Equipment Requirements for Safe Management of Locally Generated Radwastes. *I. I. Kutbi, A. M. Mamoom, W. H. Abulfaraj and K. H. Al-Sulaiman; King Abdulaziz University, Saudi Arabia*

9:30 THAM-B.5
Los Alamos Fatalities Report: An Opportunity to Communicate About Radiation. *L. E. Wahl and L. A. Andrews; Science Applications International Corporation and Los Alamos National Laboratory*

Thursday

8:30 - 10:00 AM Room: 101 I/J

THAM-C: Regulatory/Legal Issues

(Oral Session)

Co-Chairs: Kevin Nelson and James Tripodes

8:30 THAM-C.1
Status Report on Radiation Research Activities at the National Research Council. *S. L. Simon; National Academy of Sciences*

8:45 THAM-C.2
ANSI/HPS NORM Standard - Update of Development Activities. *J.-C. Dehmel and S. Y. Chen; S. Cohen & Associates, Inc. and Argonne National Laboratory*

9:00 THAM-C.3
The U.S. Department of Energy's Amendment to Title 10 Code of Federal Regulations Part 835. *J. L. Rabovsky, P. V. O'Connell and J. D. Foulke; US Department of Energy, Washington, DC*

9:15 THAM-C.4
Human Subject Protections in Clinical Research using Radioactive Materials. *M. W. Ocasio and P. J. Papin; VA Medical Center, San Diego and San Diego State University*

9:30 THAM-C.5
Lessons Learned from Occurences Under the Price-Anderson Amendment Act. *C. F. Wu; Waste Isolation Pilot Plant*

9:45 THAM-C.6
Comparison of Radio-Frequency Radiation Exposure Standards Worldwide. *L. S. Erdreich, W. H. Bailey, B. J. Klauenberg and M. Murphy; Bailey Research Associates, Inc. and Air Force Research Laboratory*

12:30-2:30 pm Hilton Hotel, Salons D/E/F/G

HPS Awards Luncheon

3:00-5:00 PM PEP Program

AAHP COURSES

Saturday, July 11, 1998, 8:00 am-5:00 pm

Each Course is worth 16 CEC's

AAHP Course 1

Human Radiobiology Update. *Kenneth L. Mossman; Arizona State University*

The health effects of primary concern following exposure to low levels of ionizing radiation include genetic effects, cancer induction and pre-natal developmental effects. This course will explore the nature of these health effects and some of the factors which determine risk. The common thread which links these effects is that non-lethal changes in cells, rather than cell killing, are responsible for observable changes. Emphasis will be placed on cancer as the chief somatic effect of radiation of principal concern at low doses. Material covered will be limited to cancer induction in human populations following exposure to ionizing radiation. Discussions will include the kinds of populations studied and the evidence for radiation-induced cancer in man, what we know about radiation carcinogenesis and what we do not know, and estimates of carcinogenic risks especially at low doses.

AAHP Course 2

Health Physics Applications of Uranium Toxicity. *Allen Brodsky, Patricia Durbin, McDonald Wrenn and Ronald Kathren; Berlin, MD, University of California, Berkeley, Moab, UT and Washington State University*

This course will begin with a discussion of the chemistry of uranium compounds and routes of entry and distribution in the body. The course will address uranium toxicology and methods to enhance elimination; modeling of uranium metabolism for purposes of estimating intakes; and calculation of tissue burdens and internal radiation doses from intakes. A comparison of intake estimates from bioassay with those from autopsy, and some case data on intakes and dosimetry from human cases will be presented. The application of uranium toxicity and metabolic data to determining limits on intake and limits on contamination will be discussed. The course will conclude with a session on the development and application of standards for protecting workers and the public.

AAHP Course 3

Health Physics Aspects of Decontamination and Decommissioning Activities. *Edward Walker, Kenneth Fleming and Larry Katonak; Bechtel Environmental, Inc. and RMI Environmental Services.*

This course will present an overview of the decommissioning and/or remediation process based on the various application phases of that process. Within each phase, discussion will focus on those aspects that are driven by health and safety considerations; or may be of significant interest to the health and safety professional. [Today's HP must be cognizant of a wide spectrum of health and safety issues.] Major course topics will include hazard characterization; hazard evaluation and work planning; worker training, qualification, surveillance, and record requirements; work control preparation and execution; contamination control and decontamination technology applications; disassembly and demolition technology applications; waste management; and final verification and regulatory issues. The presentation will focus more on the "how-to" rather than on a description of requirements.

PROFESSIONAL ENRICHMENT PROGRAM

Sunday, July 12, 1998 through Thursday, July 16, 1998

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 Sunday, July 12, the day before the Annual Meeting, a series of 30 courses will be offered. The Sunday sessions begin early to allow for 3 sections that day. The program begins at 8:00 am and finishes at 4:00 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, Tuesday, 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 revised scheduling of the Annual Meeting. There will be six Thursday afternoon PEP sessions from 3:00-5:00 pm.

Registration for each two-hour course is $40 and is limited to 60 attendees on a first-come, first-served basis. Note that Course 3A is limited to 35 participants and 3C to 30 participants. 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 June 19. All refunds will be issued AFTER the meeting. Exceptions will be handled on a case by case basis.

Sunday, July 12 – 8:00-10.00 AM

1-A

Preparation for Part I of the ABHP Certification Examination. *Clayton French; University of Massachusetts Lowell*

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-B

Examples of Risk Assessment and Optimization (ALARA) Analysis. *Bruce Dionne; Brookhaven National Laboratory*

Objective: To provide the radiological engineers with knowledge and data so that they can perform risk assessments and optimization analyses. This information will be needed to comply with Federal Regulations and to support decisions relating to cleanup levels for nuclear sites and facilities. Included will be: NRC Regulations and Guidance; DOE Regulations and Guidance; Risk Assessments for Decommissioning; Optimization Analysis for Decommissioning; Risk Assessments for Environmental Restoration; Optimization Analysis for Environmental Restoration; Risk Assessments for Recycling; and Optimization Analysis for Recycling.

1-C

Capitol Associates' Legislative Workshop for the Health Physics Society. *Liz Gemski; Capitol Associates, Inc.*

This course will address three specific issues: 1) the legislative process, 2) advocacy and participation in the legislative process, and 3) a legislative update. The legislative process portion of the course will include information about the budget, appropriations, and regulatory processes. The advocacy portion of the workshop will include a guide to help prepare you for Capitol Hill meetings, tips to make a congressional visit successful, how to maintain a relationship with Members and their staff, and how to write effective letters to Members of Congress. This portion of the course will stress the importance of contact with Congress and legislative staff, both as a member of the Society and as a constituent and voter. We will explain the process of how to become a public advocate in Congress. The legislative update will include a brief overview of pending legislation that is important to the Health Physics Society.

1-D

Direct Measurements of Surface Activity Using the MARSSIM Guidance. *Eric Abelquist; ORISE*

This course will provide a comprehensive overview and discussion of the guidance contained in the Multiagency Radiation Survey and Site Investigation Manual (MARSSIM), which is derived from ISO-7503 and NUREG-1507 documents— pertaining to assessment of surface activity levels during decommissioning. Special emphasis will be placed on the

selection and proper use of portable survey instruments for making direct measurements of surface activity. Topics will include calibration source selection, and how alpha and beta radiation energy, backscatter effects, source geometry, self-absorption, etc. affect detection efficiency under field conditions.

The ISO approach allows the surveyor greater ability to consider the actual characteristics of the surface contamination, and therefore, to more accurately assess the level of surface activity. The determination of instrument efficiency (S_i) using the proposed approach is very similar to the current practice, with the exception being that the detector response, in cpm, is divided by the 2p surface emission rate of the calibration source. This value of S_i is then multiplied by the appropriate surface efficiency, S_s, to determine the appropriate 4p efficiency for a particular surface and condition. Therefore, the significant difference between the current practice and proposed technique of surface activity assessments is in the determination of the surface efficiency, S_s. An example of how this proposed surface activity assessment technique can be used will be provided. Finally, the minimum detectable concentration (MDC) for surface activity assessments will be considered.

1-E

Simplified Problem Solving for Health Physicists. *Tom Johnson; Communication Sciences Institute, Inc.*

Do some of the problems have you stumped? This class, similar to the one given last year, will provide you with practical techniques for estimating and solving numerical health physics problems. The class will cover basic simple principles that have been used to solve seemingly complex problems based on a few assumptions.

1-F

Introduction to Physical Agents: Recommendations of the ACGIH. *John Leonowich; Battelle Pacific Northwest Laboratory*

New for 1998 - This course will introduce the current exposure criteria recommended by the American Conference of Governmental Industrial Hygienists (ACGIH) for the following physical agents:

Noise (including Infrasound and Low Frequency Sound)

Heat and Cold Stress

Static and Sub-Radiofrequency Electric and Magnetic Fields

Radiofrequency Electromagnetic Radiation

Lasers and Non-coherent Optical Radiation

Ergonomics

Those physical agents not covered in depth by other PEP classes, such as noise and heat and cold stress, will be emphasized. OSHA and other U.S. government regulations on physical agents, and how they relate to the ACGIH recommendations, will also be discussed.

1-G

Radiation Litigation - A Comprehensive Overview-Part 1. *David Wiedis; Jose & Wiedis*

The 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, how lawyers investigate a radiation case, how the case proceeds from the incident through the discovery process, preparation for trial, and the role of the health physicist in the pre-trial and trial phase of a case. The course then addresses the major issues currently being litigated in this field. These include: What is the standard of care required of a utility, the role of the federal dose standards, the role of ALARA, radiation protection and the fetus, the impact of new Part 20 on radiation litigation, "junk science," what constitutes compensable injury, and what is adequate proof of causation. Practical examples from cases will include strategy developed for depositions and trial. A major focus of the course is how to avoid litigation. We will examine common mistakes that have resulted in litigation, how to avoid them in the future, record keeping strategies, and what to do in the event you are sued.

NOTE: This is a 3-part course.

1-H

Interactions Between Ionizing Radiation Track Structure and DNA. *Noelle Metting; Pacific Northwest National Laboratory*

Radicals produced by radiation in biological systems are commonly assumed to be the same as those produced in water. However the chemical evolution following the radical production will depend on the presence of complex molecules in cells. In addition, the molecular damage to DNA will depend on geometrical relationships between energy deposition (track structure), radical migration and DNA structure. Following the damage, the cell will repair DNA or it will die. If the repair results in the DNA returning to its original form, no lasting effects will occur. If not, the result is called miss repair. Miss repaired cell may have lost some of the coding information that governs reproduction and these cells could result in cancer. The double helix structure of DNA has been know for more than four decades, and the radical formation and migration can (at least in theory) be calculated. The detailed genetic structures that control repair and miss repair are still being mapped, and this new knowledge makes possible improved calculations of the probability that ionizing radiation will result in cancer in individuals. This PEP lecture is in three parts. John Johnson (Scientist Emeritus, PNNL) will describe the interaction of radiation with tissue (track structure and DNA structure) and the early chemical reactions between radiation produced radicals and cellular components. Paul Unrau (Senior Research Officer, CRL) will describe the molecular biology of DNA repair and miss-repair. The potential use of this information in radiation protection will be introduced and time allowed for questions from the audience.

1-I

Putting Health Physics Information on the Internet. *Melissa Woo; University of Illinois at Urbana-Champaign*

This session is intended for health physics professionals interested in using the Internet to distribute health physics information to peers, users and/or the general public. The various methods of providing information on the Internet will be addressed. An introduction to concepts needed for those wishing to utilize the Internet to deliver information will be covered, with emphasis on World Wide Web site design philosophy. Additionally, a general overview of technical aspects and hardware/ software issues will be presented. Some knowledge of computers and the Internet is desirable.

1-J

Dosimeter and Instrumentation Calibrations Using ISO Reference Radiations. *Paul Stansbury; Pacific Northwest National Laboratory*

International Organization for Standardization (ISO) reference radiation fields are presently used in the U.S. dosimetry accreditation programs NVLAP (National Voluntary Accreditation Program) and DOELAP (Department of Energy Laboratory Accreditation Program). It is expected that additional ISO reference radiations will be incorporated into the proficiency tests required by the accreditation programs. The ISO standards covered in this presentation describe the reference radiations to be used for radiation protection purposes as well as the methods used for evaluating the dose responses of personnel dosimeters and area survey meters. The ISO has developed a series of standards that describe reference radiations to be used for the calibration of personnel dosimeters and area survey meters. The standards also provide guidance for evaluation of dose equivalent at the point of test. When the reference point of the dosimeter or survey meter is placed at the point of test in the reference field, the response, or calibration factor can then be determined. There are nine ISO standards that cover the three most commonly encountered types of radiation: photons, beta particles and neutrons. The standards for each radiation type are comprised of three parts dealing with the production and characterization of the reference radiation fields, the evaluation of the ICRU (International Commission on Radiation Units and Measurements) operational quantities at the point of test, and the methods recommended for evaluating the response, or calibration factor, of dosimeters or instruments.

This course will present and discuss the methods used to produce and characterize the reference radiation fields. The methods for calculating the ICRU operational quantities will be given along with the conversion coefficients used to compute the operational quantities from the physical quantities air kerma, absorbed dose, and fluence. Methods for the evaluation of uncertainties will be discussed along with the procedures for establishing tractability of calibration measurements to national standards.

Sunday, July 12 – 10:30 AM-12:30 PM

2-A

Preparation for Part 2 of the ABHP Certification Exam. *George E. Chabot; University of Massachusetts Lowell*

This course is intended for individuals who are considering or planning to take Part 2 of the ABHP certification examination. Some time will be spent in a quick review of techniques for preparing for and taking the examination and considerations of weaknesses in past examinations, but most of the time will be devoted to a review of the concepts and technical approaches involved in the solutions of typical examination questions. A handout will include a summary of selected equations and concepts that have appeared in the solutions of specific categories of questions. Representative questions from recent examinations will be reviewed and solutions demonstrated. Solutions to the 1997 Part 2 Examination will be made available to participants.

2-B

Basis for Risk Estimates 1947-1998. *Charles Meinhold; Brookhaven National Laboratory*

From the middle of the 1920's to 1947, the radiation protection standards were driven largely by deterministic considerations. This was followed by a period in which the major radiation protection recommendations followed the concerns of the geneticists, with a little concern for leukemia. Then we went on to concern over solid cancers. Our standards today are based on risk of cancer and severe genetic effects. Strangely, though, many of the ALIs are constrained by concern over deterministic effects. As we move forward we will expect to see some changes in our estimates of the genetic effects. In fact, it may well be that for the first time genetics will have a fairly small role to play in our development of radiation protection standards. The important message in this course is that the absolute value of the risk estimates that are the basis for recommendations have to be single point values. This is because of the need for international standardization. This is not meant to imply great precision and, in fact, uncertainty in all of these risk estimates will be an inherent part of this course.

2-C

Capitol Associates' Legislative Workshop for the Health Physics Society. *Liz Gemski; Capitol Associates, Inc.*

See 1-C for description – Repeat of that course.

2-D

NRC Regulatory Guide on Demonstrating Compliance With the Radiological Criteria For License Termination. *Steve McGuire; U.S. NRC*

On July 21, 1997, the U. S. Nuclear Regulatory Commission published a final regulation on radiological criteria for license termination (62 Federal Register 39058). That regulation permits the release of sites if the annual dose to the average member of the critical group would not exceed 0.25 mSv (25 mrem) and the residual radioactivity has been reduced to a level that is as low as is reasonably achievable (ALARA). Under certain conditions, restrictions on future site use may be used to achieve compliance with the 0.25 mSv (25 mrem) dose limit. The NRC is developing a draft Regulatory Guide on how to comply with the new regulation. The subjects in the guide are: (1) dose modeling, (2) methods to conduct a final status survey, (3)methods to perform an ALARA analysis, and (4) release of a site under restricted conditions. This PEP session summarizes the important points in the guide.

2-E

NORM and TENORM - Producers, Users, and Proposed Regulations. *C. D. Hull; Oxford Instruments Nuclear Measurements Group*

NORM (Naturally Occurring Radioactive Material) is disseminated throughout the planet and TENORM (Technologically Enhanced Naturally Occurring Radioactive Material) is prevalent in industrial societies. This course provides definitions and examples of materials that contain NORM and a review of major producers and users of the products that contain naturally occurring

radionuclides. TENORM contains these same naturally occurring radionuclides, but activities in these materials are usually elevated. This is because ^{238}U and ^{232}Th decay chain nuclides are redistributed and often concentrated during industrial or chemical processing of bulk materials that contain NORM. A variety of products such as chemical fertilizers, some petroleum products and mine tailings, rare earths and zircon sands, metals produced from certain types of ores, etc., contain TENORM. The industrial processes that concentrate these nuclides shall be reviewed and discussed in this course.

NORM and TENORM are not directly regulated at this time. However, the Conference of Radiation Control Program Directors (CRCPD) Commission on NORM recently completed the public review portion of "Part N" - the suggested State regulations for NORM and TENORM. One outcome of the work of the Commission on NORM is the recommendation that only TENORM be regulated. The Commission on NORM also emphasized that "Part N" contains only suggested regulations. A review "Part N" and its implications on the distribution and uses of TENORM shall also be presented and discussed in this course.

2-F

Introduction to Non-Ionizing Radiation and Fields. *John Leonowich; Battelle Pacific Northwest Laboratory*

Newly Revised for 1998 - The biological effects of non-ionizing radiation and fields continue to be of concern to both the public and the health physics community. These fields have been linked to a number of health effects, including cancer. This introductory course will cover the following topics: low frequency (0 - 3 kHz) electric and magnetic fields, radiofrequency/microwave radiation (3kHz - 300 GHz), ultraviolet non-coherent (100 - 400 nm) optical radiation, and coherent (i.e. laser), optical radiation (100 nm - 1mm). Exposure criteria of the Institute of Electrical and Electronic Engineers (IEEE), the American Conference of Governmental Industrial Hygienists (ACGIH), as well as the International Commission for Non-ionizing Radiation Protection (ICNIRP) will be reviewed. Finally, how to establish appropriate control measures will be discussed. It is recommended that the PEP course be attended as a prerequisite for all other PEP courses discussing non-ionizing radiation and fields. At the end of the course, the student will understand the proven health risks associated with this portion of the electromagnetic spectrum, as well as be able to explain these risks to the concerned layman.

2-G

Radiation Litigation - A Comprehensive Overview-Part 2. *David Wiedis; Jose & Wiedis*

See 1-G for description of all 3 parts.

2-H

Biological Safety for the Health Physicist. *Robert Emery; University of Texas at Houston*

Radiation safety professionals encounter biological hazards in a variety of workplace settings, including health care institutions, biomedical research facilities, bioassay programs, waste programs, and emergency response. This course is designed to provide health physicists with the practical information necessary to anticipate, recognize, evaluate, and control the various biological hazards present in these environments. An overview of the regulations and guidance documents associated with the discipline of biological safety is also provided, along with an extensive listing of useful references.

2-I

Computer-Based Radiation Safety Training. *Carolyn Owen; Lawrence Livermore National Laboratory*

The traditional approach to radiation safety training has been to provide a stand-up lecture and/or video on the topic and a repeat performance periodically of the same material. New approaches to meeting training requirements are needed to address the advent of flexible work hours, telecommuting, and the employee that would like a different approach to learning than the traditional lecture. Computer-based training will be reviewed and demonstrations of several different computer-based radiation safety training classes will be provided. The different types of software used and options for creating your own radiation safety training classes on computer shall be discussed. At the end of the course, a participant shall be well acquainted with alternative radiation safety training options on the computer and have the necessary information for implementing similar approaches at their own facilities.

2-J

Demystifying Internal Dose Calculations. *Michael Stabin; Oak Ridge Institute for Science and Education*

Internal dose calculations have intimidated many would-be students, as the material often seems to involve hundreds of mystifying equations and symbols. In truth, internal dose calculations are not very difficult, and any system of internal dosimetry can be understood from a few basic first principles relationships. After that, the various systems (e.g., ICRP 2, MIRD, ICRP 30) are different only in the symbols used to represent certain grouped quantities. In this talk, these basic relationships will be explained, and most of the major internal dose systems that have been developed will be explained within this context. The use of the internal dose kinetic systems to interpret bioassay data will also be explained. Example calculations from several of the most-used systems will be given as well. With this material, any health physicist should be able to understand most internal dose problems that may be encountered, and the handling of more complex problems becomes simply a matter of adding details.

Sunday, July 12 – 2:00-4:00 PM

3-A

Domestic Transportation of Radioactive Material - An Overview. *Dan Tallman; Environmental Management and Controls*

NOTE: Class limited to 35 participants.

In a condensed version of the normal three day seminar presented on the subject of radioactive transportation regulations, this class will cover the basic organization and authority of the DOT and NRC over radioactive transportation. Also covered will be their recent revision to provide a higher degree of consistency with the regulations of the IAEA. In, addition, the requirements and basic philosophy associated with characterization, packaging, marking,

labeling, shipping paper and certification development, placarding and surveys will be covered. The means to except a majority of the routine shipments made from many of these requirements will also be discussed. A brief overview on mixed waste and consignment compatibility will be provided. In order to get the most from this review, some previous knowledge of the regulations, a recent copy of 49CFR100-185, and a calculator will be helpful.

3-B

Classification and Disposal of Radioactive Wastes - History and Legal and Regulatory Requirements. *David Kocher; ORNL*

Under current law, several classes of radioactive waste arising from operations of the nuclear fuel cycle are defined. These waste classes include spent fuel when it is declared to be waste, high-level waste, transuranic waste, low-level waste, and uranium and thorium mill tailings. The primary purpose of this course is to review (1) the historical development of the definitions of the different classes of radioactive waste and their current definitions in law and (2) the legal and regulatory requirements for disposal of the different classes of radioactive waste. Requirements for management and disposal of naturally occurring or accelerator-produced radioactive material (NARM) not arising from operations of the nuclear fuel cycle also are considered. The current classification system for radioactive waste is based primarily on the source of the waste, rather than its radiological properties, and it is largely qualitative and, thus, somewhat ambiguous. Furthermore, even though permanent disposal is the desired endpoint of radioactive waste management, the waste classification system does not associate waste classes with requirements for particular disposal systems. Thus, wastes in different classes can have similar properties and require similar precautions for safe management and disposal. Alternative waste classification systems based on risks from disposal are considered.

3-C

Effective Strategies for Communicating Risk. *Jerrold Bushberg; Sacramento Medical Center*

NOTE: Class limited to 30 participants.

This presentation will focus on risk communication strategies in order to enable professionals to more effectively communicate radiation risks in public settings. The seminar will discuss the fundamentals of effective communications, common perceptions and misconceptions regarding radiation health risks, understanding the factors that engender public "outrage," and managing those issues. The first part of the seminar will begin by reviewing the fundamentals of effective communication and understanding public perceptions as described above. The second part will be interactive, utilizing a mock public hearing to practice and sharpen your communication skills. Participants will have the opportunity to work in teams during mock public hearings both as proponents and opponents of a proposed controversial project. At the conclusion of this seminar, participants should have a better understanding of effective communication strategies and the nature of public controversy and its management.

3-D

Environmental Remediation. *Mark Miller; Roy F. Weston*

This course will introduce the basic components of successful remediation programs at radioactive and hazardous waste sites. Topics will cover regulatory compliance, site characterization, removal techniques, waste management, decontamination and release of materials for unrestricted use, health and safety, and quality assurance/quality control programs. Several case studies will be presented and discussions will focus on problems routinely encountered in the field and how these might be mitigated. Use of the newly released Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) will be briefly discussed within the overall context of this program.

3-E

Contemporary Issues in Radiological Health. *Ken Mossman; Arizona State University*

This PEP course will explore two controversial issues as driving forces in contemporary health physics: (A) health effects of domestic radon exposure and (B) the linear no-threshold theory (LNT) in regulatory decision-making. Discussions of radon will include the recent BEIR VI report findings, radon induced lung cancer as a public health problem, and radon-tobacco smoke interactions. Discussion of the LNT debate will focus on three questions: (1) Is there a dose threshold-can a single ionizing event in a critical cell result in cancer? (2) Is radiation damage repairable? (3) Is dose-response linear in the low dose range or are there non-linear effects such as hormesis?

3-F

Practical Laser Safety. *Joe Greco; Kodak and Tom Lavake; Johnson and Johnson*

Have you been tasked with laser safety responsibilities at your facility? Do you want to enhance your current laser safety program? In this PEP, two laser safety officers with experience in industrial and R&D laser environments will discuss successful approaches to situations that may be commonly encountered. Topics of discussions will include: current standards and regulations, training for LSOs and laser users, medical surveillance requirements, approaches to laser inspections, eyewear selection, laser pointers, web sites of interest, and others. Attendees are encouraged to bring their questions to class for group discussion.

3-G

Radiation Litigation - A Comprehensive Overview-Part 3. *David Wiedis; Jose & Wiedis*

See 1-G for description of all 3 parts

3-H

MQSA Procedures and Impact on Mammography Practice. *Theodore Villafana; Allegheny University of Health*

The performance of mammographic procedures has been formalized into federal law. The MQSA has set requirements as to physicians interpreting mammograms, radiological technicians performing examinations, and physicists evaluating the mammographic equipment. These will be reviewed as well as a comprehensive description of mammographic equipment and tests that need to be performed. Personnel exposure experience and

radiation exposure patterns around mammographic equipment will be discussed. NCRP patient dose formalism and personnel dose factors will be discussed as well as the rationale and impact of MQSA tests on them.

3-I

Advanced Internet Topics for Health Physicists. *Bruce Busby; Ann Arbor, MI*

The Health Physics community has an active on-line presence, with HPS, HP Journal, AAHP, NRRPT, and NCRP having exceptional web sites. And of course, mailing lists and E-mail are popular. But, are you getting the most out of the net? Is there more to it than the WWW and E-mail? Should you worried about Internet security or viruses? Want to know how to find on-line nuclear data? This session will answer these question and more. Topics to be covered in this lecture include: file compression and transfer, newsgroups, security issues, viruses and hoaxes. Moreover, advanced HTML topics such as using forms, tables, graphics and programming will be discussed. Much of the session will focus on how health physicists can better utilize the Internet with many real-life examples demonstrated on-line. Basic knowledge of Internet fundamentals is desirable but not required. Handouts will be available.

3-J

Radiation Dose to the Embryo/Fetus from Internal Emitters. *Michael Stabin; Oak Ridge Institute for Science and Education*

Radiation dose calculations for the embryo/fetus from internal emitters have been greatly facilitated recently through the publication of several new models and documents. In this talk, current methods for calculation of the embryo/fetal dose will be discussed, and several example calculations, including some case studies, will be presented. The talk will cover applications in nuclear medicine as well as in the nuclear fuel cycle. The recently developed phantoms representing the adult female throughout pregnancy will be discussed, and available tools for the calculation of embryo/fetal dose (e.g., MIRDOSE 3.1, NUREG/CR-5631) will be described and demonstrated. With this material, the student should be able to handle most situations involving the calculation of radiation doses in pregnancy.

Monday, July 13 – 12:15-2:15 pm

M-1

Radiation Dose to the Embryo/Fetus from Internal Emitters. *Michael Stabin; Oak Ridge Institute for Science and Education*

See 3-J for description – Repeat of that course.

M-2

Laser Safety Calculations for the Health Physicist. *John Leonowich; Battelle Pacific Northwest Laboratory*

New for 1998 - This course assumes that the student has a basic understanding of laser physics. Attendance at the PEP course Introduction to Non-ionizing Radiation, as well as an introductory laser safety class, is recommended. The following laser safety calculations, as required by ANSI Standard Z136.1 "For the Safe Use of Lasers" will be covered:

Determination of Appropriate Maximum Permissible Exposure (MPE's) Limits

Accessible Exposure Limits (AEL's) and Laser Classification

Nominal Hazard Zone (NHZ) Calculations

Optical Density (OD) Calculations

Extended vs. Point Source Exposures

Illustrative examples of all the above will be presented. Participants are asked to bring a scientific calculator with them to the class.

M-3

Statistics and Radioactivity Measurements: Getting Past the Semantics to the Meaning. *Daniel Strom; Pacific Northwest National Laboratory*

We frequently detect activity that is less than the minimum detectable activity! This occurs because the "minimum detectable activity" is misnamed, not because we are doing something impossible or nonsensical. The random nature of radioactive decay leads to erratic count rates when the total number of radioactive transitions detected is not very large (<100), a situation complicated by the need to subtract some value of "background" from the observation of the sample. Both classical and Bayesian statistical methods address this problem. Pioneering scientists grappled with the terminology for characterizing counting system performance and interpretation of data. Unfortunately, the choices made for terms in the 1960s and later have caused decades of confusion. Had Currie's 1968 term "critical level" (a.k.a. "decision level") been named the "false alarm level" and expressed only in terms of directly observed quantities (e.g., counts or count rates), it may have avoided the confusion so prevalent today. Had Currie's "detection level" (a.k.a. "lower limit of detection," "minimum detectable activity") been named "advertizing level" and expressed only in terms of the ultimate quantity of interest (e.g., Bq, uCi, Bq/kg, or pCi/g) we might not be in a situation in which the quantity it represents is so widely misused. This course covers basic concepts (precision and accuracy), the nature of the radioactive decay measurement process, the statistical basis for interpreting measurements, how measurement precision is affected by counting time, and sample calculations. Participants are urged to bring their favorite calculator and join in some hands-on statistics. "Never compare a measurement result with an advertizing level (MDA); compare measurement results with a false alarm level (DL)."

M-4

Be Prepared! Implementation of the Final Mammography Quality Final Regulations. *Trisha Edgerton; State of California*

All mammography facilities in the United States must be certified to perform mammography by the FDA. Since the adoption of the Act, facilities have been following the "Interim Rules," a quick-and-dirty five page set of regulations. Through regular meetings of the NMQAAC, along with comments from facilities, physicians, technologists and consumer groups, the final regulations were published in the Federal Register on October 28, 1997. Because of the extensive changes represented by these new regs, the implementation date is 18 months after their published date, or April 28, 1999. This PEP course will explain the mysteries surrounding mammography operations including: 1) the difference between Accreditation and Certification; 2) State requirements versus Federal requirements; and 3) detailed explanations of the Final Regulations.

Topics covered with respect to the new regulations will include: 1) a brief explanation of the changes to Accrediting Body rules; 2) technologist, physician and physicist qualifications (initial experience, initial education, continuing education, continuing experience, and re-qualifications for personnel who do not meet the continuing experience/ education requirements); 3) machine requirements; 4) annual physicist evaluations; 5) quality assurance; 6) required patient notification; 7) consumer complaint mechanisms; and 8) medical outcomes audit. These new regulations reflect major changes in the way facilities will need to operate their programs effective April 28, 1999. Adequate prior planning is a must in order to maintain compliance. This PEP course will assist consulting physicists and others to understand new regulations and implement them before the deadline of April 28, 1999.

M-5

University and Medical Radioactive Waste Management. *Joseph Ring; Harvard University*

This presentation discusses the aspects of a radioactive waste management program designed for a large university and medical research complex to contain costs and to reduce the impact of waste regulations. The presentation includes discussion of decay-in-storage, incineration, packaging, mixed wastes and training for the waste programs. Emphasis is placed on a cooperative effort with investigators to pre-plan operations as well as simple techniques to implement and contain costs. The presentation discusses how to review research applications with an eye to waste in the program, how the laboratory group packages and how the safety office manages the generated waste. To ensure oversight for cost containment and generation rates, a series of metrics, or numerical ratios, are presented which one can use to evaluate the effectiveness of a radioactive waste management program.

M-6

How to Design and Run a Bioassay Program. *Eugene Carbaugh; Pacific Northwest National Laboratory*

This practical applications class walks through the elements of designing and operating a bioassay monitoring program. We look at the "drivers" for bioassay, how to identify when a program is needed, selection of methods, determination of sensitivity, application to work force, operational logistics, data interpretation, quality assurance aspects, and provide some useful references. The principles and specifics covered are appropriate for both large and small scale programs.

6:30-8:30 PM

M-7 (Monday Evening) NEW ADDITION

New Technologies in Project Planning and Execution - Geographic Information System. *Dixie Wells; Las Vegas NV*

This course will present an informational overview of the GIS and it's capabilities today. It is a computer system that records, stores, and analyzes information about the features that make up the earth's surface. A GIS can generate two- or three-dimensional images of an area, showing natural features such as hills and rivers with artificial features such as roads and power lines. Scientists use GIS images as models, making measurements, gathering data, and testing ideas. GIS is a strong tool which can make project planning much easier for all professionals. Cost preparations can be pinpointed by eliminating unknowns from the project makeup. Presentation of materials in both proposal and final drafts of reports can be enhanced by GIS. GIS technology can be used for scientific investigations, resource management, and development planning. For example, a GIS might be used to find wetlands that need protection from pollution, or calculate the probable contamination flowpath based on actual geographic representation.The future of a GIS in characterization, remediation, and decommissioning is offered for group discussion.

Many GIS databases consist of sets of information called layers. Each layer represents a particular type of geographic data. The GIS combines these layers into one image, showing how various types of data relate to one another. A GIS accepts geographic data from a variety of sources, including maps, satellite photographs, and printed text and statistics. Operators program the GIS to process the information and to produce the images or information they need.

Tuesday, July 14 – 12:15-2:15 pm

T-1

Interlock Design and Testing for Radiation Generating Devices. *Norman Rohrig; Lockheed Martin Idaho Technologies Company*

Interlocks are used to prevent radiation related injuries resulting from accelerators and other radiation generating devices. Good practices recommended in NCRP 88, relevant ANSI standards, and regulations will be discussed including fail safe design and redundance. Some interlock failures will be identified. Testing protocols and the impact on failure reduction will be discussed.

T-2

Performance-Based Assessment of Radiological Protection Programs. *Larry McKay; U.S. Dept. of Energy*

The objectives of this course are to discuss methods of effectively planning, conducting, reporting and performing follow-up actions for performance-based assessments of radiological protection programs. This course is intentionally designed to be generic in nature (to apply to programs in all nuclear environments). However, to illustrate critical points, specific examples will be included form NRC licensees, DOE facilities, and industrial installations. In addition, the instructor will include personal suggestions on making this process work more smoothly, guidance derived from over 20 years of assessment experience.

To derive maximum benefit from the course, the participant should have a working knowledge of applied health physics, a general understanding of assessment methodology, and occupy a position responsible for either the management or assessment of an operational radiological protection program.

T-3

Final Status Decommissioning Surveys: Design Using MARSSIM-Part 1. *Carl Gogolak; U.S. DOE, Environmental Measurements Lab*

An overview of statistical methods for final status survey design using the Data Quality Objectives (DQO) process as presented in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) will be provided. The participants will break into groups to work through an

example case, specifying objectives, choosing appropriate instrumentation/ analysis, and calculating the numbers of samples/measurements. The results will be discussed and compared to illustrate some of the flexibility that is built into the process. Participants are encouraged to obtain a copy the MARSSIM prior to the course. A pocket calculator or laptop computer would be useful for the class exercise.

T-4

Current Approaches to Regulating Public Exposures to Radionuclides and Hazardous Chemicals. *David Kocher; ORNL*

Under current law and regulations, two different approaches are used to control exposures of the public to hazardous substances in the environment. The different approaches to risk management apply to (1) radionuclides only as regulated under the Atomic Energy Act and (2) hazardous chemicals or radionuclides as regulated under any other laws (e.g., Safe Drinking Water Act, Clean Air Act and CERCLA). This course discusses the two different approaches to risk management, the resulting inconsistencies in lifetime cancer risks that are regarded as "acceptable" or "unacceptable," and the potentially adverse impacts of the current regulatory approach for chemical carcinogens on the traditional approach to regulating radiation exposures of the public. The course then discusses how the apparent inconsistencies between the two regulatory approaches can be reconciled based on recognition of (1) the fundamental difference between the use of exposure limits for radionuclides but risk goals for hazardous chemicals, (2) the different meanings of "acceptable" and "unacceptable" risks in the two approaches, and (3) the primary importance of the ALARA principle in risk management decisions using either approach. Based on these concepts, a unified regulatory framework which is consistent with all current regulations and guidances for limiting risks to the public from routine and accidental exposures to radionuclides and hazardous chemicals is developed.

T-5

Methodology for Compliance with a Revised ANSI N13.1 Stack Sampling. *Andrew McFarland; Texas A&M University*

ANSI N13.1, which covers air sampling from stacks and ducts of the nuclear industry, is being revised to emphasize acquisition of representative samples from a single point in a flow field. Numerical criteria are applied to the mixing of both fluid momentum and contaminant concentration to demonstrate the acceptability of a sampling location. Results of laboratory and field testing will be presented for several variations of stack and duct geometries to show the approaches that have been used for selection of a sampling location or for achievement of suitable sampling conditions at a prescribed location. The revised standard will require testing to be performed on either the actual stack, a scale model of the stack or on a geometrically similar stack to demonstrate compliance with the mixing criteria. The mixing criteria are given in terms of the uniformity of the profiles of velocity, tracer gas and 10 micrometer aerosol particles. Methodology for characterizing the quality of mixing will be presented.

T-6

New MIRD Techniques for Medical Internal Dosimetry. *Wesley Bolch; University of Florida*

The following course is offered to those individuals with specific interest in medical internal dosimetry. The latest advances in medical dosimetry developed through the Medical Internal Radiation Dosimetry (MIRD) Committee of the Society of Nuclear Medicine are presented in a form available for direct use in clinical applications. Following a brief review of the MIRD schema, four specific areas of interest to the nuclear medicine dosimetrist are given. The first topic will cover the MIRD Committee's newly adopted dosimetric model of the head and brain. This model allows for consideration of SPECT/PET localization within specific brain subregions such as the cauduate and lentiform nuclei. The second topic will introduce methods of explicitly considering electron transport in internal dose calculations, not formerly considered under the MIRD or ICRP methodologies. Examples will be shown for its influence on current dose estimates to various organs as a function of age. The third topic will cover beta particle dosimetry of both trabecular and cortical bone. Techniques are shown for estimating both site specific and skeletal average doses based on the updates to the skeleton of Reference Man given in ICRP Publication 70. The fourth and final topic will present new techniques for rapidly assessing isodose contours and dose volume histograms in both normal and tumor-bearing organs imaged through quantitative SPECT or PET.

Wednesday, July 15 – 12:15-2:15 pm

W-1

Communicating Health Physics. *Ellen Hochheiser; Fluor Daniel Hanford, Inc.*

Health Physicists are frequently required to explain radiation safety to many different individuals, each with his or her own background. These individuals can include non-technical managers, researchers, health physicists, health physics technicians, maintenance technicians, operators, general public, physicians, etc. Each individual comes complete with his or her own knowledge, concerns and prejudices. This PEP will address general techniques for discussing radiation risks and benefits to varied groups. Much of this session will be discussions on successful techniques for handling specific situations.

W-2

Statistical Considerations for Aerosol Sampling. *Mark Hoover; Lovelace Respiratory Research Institute*

A set of commonly encountered problems will be presented and solved for the appropriate use of statistics in a technically defensible air monitoring program. Topics will include properties of the lognormal distribution; calculating the likelihood of aerosol releases and the need for air sampling; using air sampling results to determine the need for respiratory protection; determining the limit of detection and minimum detectable activity for fixed air sampling systems; determining the minimum detectable activity and false alarm rate for continuous air monitors; determining an appropriate number of samples to characterize exposures for a similar (homogeneous) exposure group; use of upper and lower

confidence intervals to determine if exposure limits have been exceeded; and determining the adequacy of safety programs though probabilistic (Monte Carlo) simulations of potential exposures from multi-step accident processes.

W-3

Final Status Decommissioning Surveys: Data Analysis Using MARSSIM - Part 2. *Carl Gogolak; U.S. DOE, Environmental Measurements Lab*

An overview of statistical methods for final status survey data analysis using non-parametric statistics as presented in the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) will be provided. Simulated survey results will be used to illustrate the statistical procedures used to evaluate final status survey data. The participants will break into groups to work through an example case, summarizing the data, performing the calculations for the statistical tests, and drawing conclusions. The results will be discussed and compared to illustrate some of the flexibility that is built into the process. Participants are encouraged to obtain a copy of the MARSSIM prior to the course. A pocket calculator or laptop computer would be useful for the class exercise.

W-4

Cellular Defense Mechanisms Against the Biological Effects of Ionizing Radiation. *Doug Boreham; AECL, Chalk River Laboratories*

Radiation protection practices are in place because ionizing radiation can cause harm to living organisms. Radiation can alter the genetic program contained within the DNA of living cells and if the genetic information is damaged or altered the cell may become cancerous. Fortunately, cells have evolved mechanisms that protect and repair normal DNA or eliminate misrepaired DNA. Our work focuses on two of these mechanisms: the adaptive response and apoptosis. The adaptive response has been well characterized in many organisms including humans. When cells are exposed to sublethal low level doses of radiation, they can subsequently undergo an adaptive response and develop resistance to further radiation exposure. This transient cellular state of resistance is believed by some scientists to alter the health risks (cancer) associated with radiation exposure. The research presented during this seminar will introduce the audience to the health effects of ionizing radiation and describe the biological risks associated with radiation. The purpose of the presentation will be to identify the factors that affect risk, and show how risk may be modified by the adaptive response.

Apoptosis is another a cellular mechanism that is responsive to radiation exposure and can alter the biological outcome of further radiation exposure. It is a genetically programmed form of cell death or cell suicide. Cells damaged by radiation can be selectively removed from the population by apoptosis and therefore eliminated as a potential cancer risk to the organism. We have previously shown that apoptosis is a sensitive indicator of radiation damage in human cells. We will present new evidence that shows how this process is influenced by chronic radiation exposures and relate this to cancer risk from chronic radiation exposures.

Overall, this seminar will educate the audience on current trends in radiobiological research and introduce concepts that may affect new approaches to radiation risk assessment.

W-5

Uses and Abuses of Models in Radiation Risk Management. *Daniel Strom; Pacific Northwest National Laboratory*

"All models are wrong, and some are useful" (George E.P. Box, 1979). A variety of scientific models are used to relate biological insult (such as exposure to microbes, chemicals, and energy fields) to various health endpoints. Such models (as distinct from theories and hypotheses) play an important role in the risk assessments that are used in risk management. This course provides an overview of the kinds of health effects that can be quantified and modeled, and then describes models commonly used in relating effects of ionizing radiation to various measurable or "model-able" quantities. Because there are no human data to use as input to models in many important cases, the bases for extrapolation are discussed. The "weight of evidence" for various molecular, cellular, tissue, and organism studies must be determined. In this context recent publications on the Japanese survivors of nuclear bombings, eleven cohorts of underground miners, and meta-analyses of indoor-radon case-control studies are presented, along with a review of BEIR VI. Stephen L. Brown defines three distinct uses of risk assessment models as prevention (or protection), prediction, and priority-setting. The best choice of model depends on its intended use and also on non-scientific considerations in risk management. Appropriate and inappropriate uses of the linear, no-threshold model are illustrated.

W-6

Radiochemistry Practices and Requirements Related to Environmental Characterization and Monitoring. *Gary Troyer; Westinghouse Hanford, Co.*

In addition to survey instruments and dose meters, radiation protection in both the workplace and environment relies on radiochemistry techniques to sort out and quantify source term nuclides of interest. These techniques may be applied to low level environmental and bioassay samples as well as high activity nuclear process materials. Traditional bioassay sample analyses are well developed due to reasonable uniformity of matrix. However, environmental samples may have a large range of chemical challenges which must be considered in the selection of an appropriate analytical method. In some situations, high radiation level samples are also encountered such as those found in site or facility characterization in preparation for decontamination and decommissioning. In addition, regulatory agencies are establishing criteria and guidance on laboratory performance and reporting protocols.

This PEP course will survey the generally accepted techniques, correlate practice with target needs, identify limitations and discuss current issues. The topics of sample chain of custody, data verification and validation, data reporting standards, and new guidance documents will be presented. The student will obtain general information on a broad range of radiochemistry methods, challenges and trends.

Thursday, July 16 – 3:00-5:00 pm

TH-1

Air Sampling Environmental Radioactivity. *E. F. Maher; Duke Engineering and Services Environmental Lab*

Collecting, analyzing, and interpreting environmental air samples around nuclear facilities are linchpins of regulatory compliance, public confidence, and data defensibility. This overview course will provide useful and practical information on environmental air sampling such as: developing a sampling strategy, selecting the appropriate collection media and equipment, minimizing sampling line losses, and obtaining representative air samples. The course, designed for the health physicist and environmental scientist, will provide specific and directly applicable guidance for the selection of air sampling methods for the more common radionuclides, calibration of air sampling equipment, isokinetic sampling, minimum detectable activity considerations, selection of filter media, and measurement of the aerosol activity size distribution.

TH-2

Mitigating Radiation Dose to Patient and Staff During Extended Time Fluoroscopic X-Ray Procedures. *Theodore Villafana; Allegheny University of Health*

A number of serious radiation-induced skin burns have been reported for patients subsequent to extended medical fluoroscopic procedures usually associated with cardiac catheterization examinations, angioplasty, or electrophysiology ablation therapies. Personnel exposures exceeding 5000 mr/year as registered on film badges worn outside protective lead aprons are now not uncommon. This PEP course will first describe commonly used fluoroscopic configurations and fluoroscopic instrumentation. Then factors affecting radiation exposure and their control for both patient and personnel will be described. Radiation monitoring strategies will be outlined for both patient and personnel.

TH-3

Environmental Radioactivity & Public Health. *C. F. Wu; Waste Isolation Pilot Plant and S. C. Lee; Carlsbad Environmental Monitoring & Research Center*

Humankind is surrounded by radiation at all times. It is important for a health physicist to be knowledgeable about the sources and levels of radioactivity in the environment. It is also crucial for a health physicist to keep up-to-date on the health effects, analytical technologies, and regulatory issues related to environmental radioactivity. This course is designed to assist health physicists in achieving these objectives. The course is instructed by a Certified Health Physicist and a Senior Radiochemist. Both instructors have extensive educational background and hands-on experiences in environmental radiochemistry. Major topics to be addressed include the following:

1. Sources of Radiation in the Environment,
2. Health Effects of Environmental Radioactivity,
3. Regulations Related to Environmental Radioactivity, and
4. Measurement & Analysis of Radioactivity in Environmental Media.

TH-4

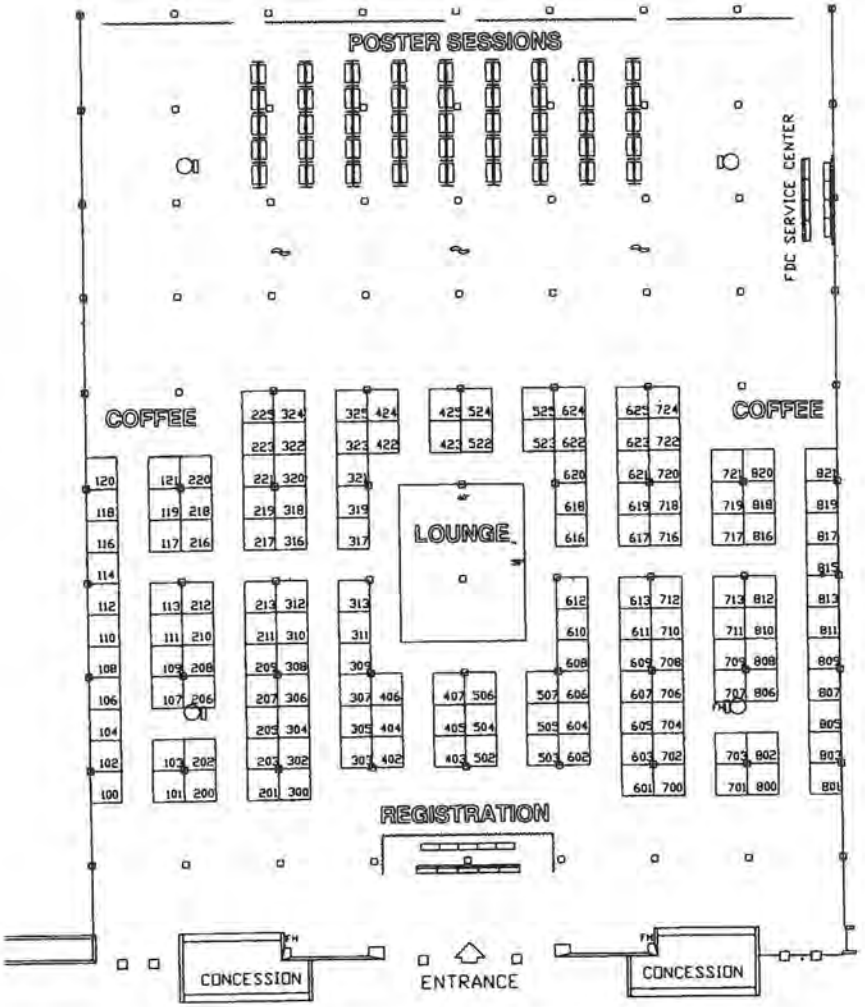
A Field Perspective for Incorporating 10 CFR 835 Requirements into the Integrated Safety Management of Work. *Gene E. Runkle; U.S. Department of Energy*

Title 10 CFR 835 was established by the Department of Energy (DOE) in December 1993 to codify the radiation protection requirements for the DOE contractor sites. Full compliance was required by January 1, 1995, and continuing adherence to the rule is ensured by Price-Anderson Amendment Enforcement processes. The Department is embarking on full implementation of the principles of Integrated Safety Management in all DOE operations. This Secretarial initiative focuses on performing work and mitigating hazards in an integrated manner, prior to initiation of the work. Radiological protection is a key consideration in many DOE work activities along with other hazards such as potential chemical exposures and operational safety considerations. Full integration of the regulatory requirements of 10 CFR 835 with other work hazards is a continuing challenge, particularly with limitations in project budgets. Line management led project teams composed of expertise in engineering, budget, rad protection, industrial hygiene, safety and security; along with operational experience are key to the success of integrating safety into the management and performance of DOE work.

This session will discuss the 10 CFR 835 requirements and the principle of Integrated Safety Management as they relate to performing work that involves radioactive materials, penetrating radiation, chemicals and physical hazards that must be addressed to provide a safe work environment. Some early lessons learned in this integration process will be shared and participants will be encouraged to discuss their own experiences and barriers from their respective work sites.

EXHIBIT HALL FLOORPLAN

Exhibition Schedule	Minneapolis, MN	
Sunday, 7/12	Noon-5:00 PM	Set Up
Monday, 7/13	7:00-10:30 AM	Set Up
	Noon-5:00 PM	Exhibits Open
Tuesday, 7/14	9:30 AM-5:00 PM	Exhibits Open
Wednesday, 7/15	9:30 AM-4:00 PM	Exhibits Open
	4:00 PM-Midnight	Tear Down



Minneapolis Convention Center

1998 EXHIBITORS

'99 ANNUAL MTG. PHILADELPHIA, PA ***Booth 114***

'99 MIDYEAR MEETING ALBUQUERQUE, NM ***Booth 112***

3M ***Booth 704***
3M Empore™ Rad Disks for the selective separation and counting of strontium, radium, cesium and technetium isotopes.

AAHP/ABHP ***Booth 110***

ADCO SERVICES, INC. ***Booth 422***
Adco Services, Inc. provides cost effective volume reduction, destruction and disposal alternatives for radioactive, mixed and hazardous waste streams. Additionally, we provide turn-key packaging, labeling, manifesting and transportation services.

ALPHA SPECTRA, INC. ***Booth 207***
Alpha Spectra manufactures scintillation detectors for health physics, academic, industrial, medical and exploration applications. Materials used include most of the scintillation phosphors e.g. NaI(Tl), BGO, plastics, etc.

AMERICAN NUCLEAR SOCIETY ***Booths 708, 710***
ANS assists nuclear science and technology professionals through individual and organizational membership benefits, public information and outreach, Nuclear News and Radwaste Magazine (advertising available), meetings and exhibits, scientific publications and journals, ANS standards, and more.

AEA TECHNOLOGY (formerly Amersham Corp.) ***Booths 618, 620***
A complete range of reference sources and solutions for instrument calibration and environmental monitoring.

ANALYTICS, INC. ***Booth 716***

AON RISK SERVICES OF ILLINOIS, INC. ***Booth 607***
Property and liability insurance products and services, including professional liability insurance.

APTEC INSTRUMENTS INC. ***Booths 317,319***
Aptec will display surface contamination instrumentation plus PC based and portable MCAs will be available for demonstration.

BECKMAN INSTRUMENTS, INC. ***Booth 220***

BERKELEY NUCLEONICS CORP. ***Booth 423***
BNC will be exhibiting our new Area Monitor for detecting the presence of radio nuclides. Also on display will be the SmartARB, our new 20 MHz Function Generator, which includes the Arbitrary Waveform Generation mode.

BICRON•NE ***Booths 503, 505, 507***
Bicron•NE offers an extensive range of Health Physics instrumentation covering: installed surface

contamination monitors, portable radiation survey meters and probes, automated vehicle monitoring systems, and the Harshaw TLD line of materials and readers including the Autoscan Track Etch reader.

BIONOMICS ***Booth 216***
Offers comprehensive radioactive and mixed waste management and disposal services.

BNFL INSTRUMENTS ***Booth 702***
BNFL Instruments provides instrumentation and services for the measurement and characterization of radioactive materials in the fields of waste management, decontamination, decommissioning and safeguards.

BUBBLE TECHNOLOGY INDUSTRIES, INC. ***Booth 713***
Latest advances in microspec portable spectroscopic survey systems featuring spectral dosimetry for x-ray, gamma, beta. Neutron bubble detector dosimetry systems.

CANBERRA INDUSTRIES ***Booths 201, 203, 205, 300, 302, 304***
Canberra will exhibit various products for lab/field radiation measurements and record keeping, including DSA-2000, ISOCS, EasySpec hand held MCA, Alpha Analyst Spectroscopy System and the Genie family of spec software platforms. We will also exhibit our HIS-20 HP record keeping software and Open CDM Chemistry Data Management products.

CAPITOL ASSOCIATES ***Booth 108***

DOSIMETER ***Booth 604***
Radiation Monitoring Instruments, State of the Art ion chambers.

DOSITEC INC. ***Booth 718***
Electronic Dosimetry Equipment, Dosimeters and Readers for computer interface.

DUKE ENGINEERING & SERVICES ***Booth 219***
Decontamination and Decommissioning, general Health Physics, Radioanalytical Laboratory services, Personnel and Environmental Dosimetry, In-Situ gamma spectroscopy, Health and Safety Consulting, and ISO 14000 Training.

EBERLINE INSTRUMENTS ***Booths 722, 724***
Radiation detection instrumentation.

EG&G ORTEC ***Booths 717, 719, 721, 816, 818, 820***
EG&G ORTEC provides a complete array of "Solutions" for spectroscopy systems users: Year-2000 compliance, 32-bit software, digital hardware, and custom radiation monitoring systems. Stop by and describe the spectroscopy problem/ opportunity you most want solved. Remember to ask about matchMaker.

EG&G WALLAC ***Booth 817***
Triathler - Personal Portable beta/ gamma counter and Luminometer.

ENVIRONMENTAL PHYSICS, INC. ***Booth 802***
Environmental radiochemistry and Bioassay analysis in support of the Department of Energy, U.S. Army Corps of Engineers, and the nuclear power industry among others.

ESM-EBERLINE ***Booth 811***
One of the leading suppliers of radiation protection instruments worldwide. Formerly known as F.A.G. GmbH and Eberline GmbH- represented in the US by Synchrotech Systems, Inc.

EURISYS MEASURES, INC. ***Booth 218***
Health Physics Instruments, HPGe detectors, silicon detectors, Geiger-Mueller detectors, He-3 neutron detectors, alpha and gamma spectroscopy systems, low background systems.

EXPLORANIUM ***Booth 217***
Exploranium designs and manufactures quality gamma radiation detection equipment including vehicle monitoring systems, conveyor monitors and hand held devices. Exploranium is the world leader in vehicle monitoring.

F&J SPECIALTY PRODUCTS, INC. ***Booth 619***
Air monitoring equipment and supplies featuring air sampling systems, air flow calibrators, filter holders, charcoal and zeolite cartridges, filter paper and radon detection devices.

FEMTO-TECH INC. ***Booth 801***

FRAMATOME TECHNOLOGIES, INC. ***Booth 800***
Radiation Protection Integrated Monitoring System (RPIMS)

FRHAM SAFETY PRODUCTS INC. ***Booth 522***

G/O CORPORATION ***Booth 307***
Presenting a complete line of Anti-C clothing and RadCon supplies including sheeting, smears, signs, tags, labels, containments and other contamination control items. Also featured is G/O's unique On-Line Ordering System for Inventory Control.

GAMMA LABORATORIES, LTD ***Booth 425***
We manufacture off the shelf and custom GM tubes (pancakes, end window, thinwall, minatures) He-3 tubes, and proportional counters.

GAMMA PRODUCTS INC. ***Booth 310***

GE REUTER-STOKES ***Booth 101***
High pressure ionization chamber for environmental monitoring.

HEALTH PHYSICS INSTRUMENTS ***Booth 712***
HPI manufactures high quality radiation measuring instruments. This includes survey meters, dosimeters, area monitors, REM meters, MCA's and other specialized measuring equipment.

HEALTH PHYSICS PUBLICATIONS ***Booth 803***

HELGESON SCIENTIFIC SERVICES *Booth 100*

HSS provides a complete range of state-of-the-art personnel and waste monitoring equipment and complimentary health physics services, including mobile whole body counting units and surface survey instruments.

HI-Q ENVIRONMENTAL PRODUCTS CO. *Booth 617*

Hi-Q Environmental Products Company is a leading manufacturer of air sampling equipment and systems. Product line includes: high and low volume air samplers, air flow calibrators and calibration services, radioiodine sampling cartridges, filter paper, filter and filter paper holders, and complete stack sampling systems.

HOLADAY INDUSTRIES, INC. *Booth 621*

Holaday Industries, Inc. offers Electromagnetic Field measuring instruments ranging from ELF Electric and Magnetic field monitoring instruments to RF and Microwave survey meters.

ICN DOSIMETRY SERVICE *Booths 601, 603, 605*

ICN Dosimetry Service-providing personnel radiation monitoring world wide.

ISOTOPE PRODUCTS LABORATORIES *Booth 608*

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 & ASSOC. *Booth 406*

Gamma, beta and neutron sources in calibrators and irradiators, in self-contained, beam and panoramic configurations. Source reloading and decommissioning services. CHAMMP for windows demonstration.

KEITHLEY INSTRUMENTS, INC. *Booth 711*

Celebrating over 50 years of quality, service, innovation, and integrity, Keithley is a leader in radiation measurements, including laser heated thermoluminescence dosimetry, precision electrometer dosimeters, x-ray field service equipment and quality assurance products.

LABORATORY IMPEX SYSTEMS LTD. *Booth 121*

A UK based company, Laboratory Impex Systems Ltd. (LIS) is a leader in the design, development and manufacture of advanced radiation detection and Health Physics Instrumentation. Catering for numerous applications, over the years LIS have compiled a comprehensive and enviable range of nucleonic products and systems; from scaler timers, through radioiodine stack monitors to site wide monitoring systems.

LANDAUER INC. *Booths 403, 405, 407, 502, 504, 506*

Leading provider of complete radiation dosimetry services to hospitals, medical/dental offices, university and national laboratories in which radiation poses a potential threat to employees.

LASER INSTITUTE OF AMERICA *Booth 309*

LND, INC. *Booth 424*

Nuclear radiation detectors-GM tubes, BF_3 He_3, ion chambers, proportional counters, gas sampling, flow and fission chambers-standard and manufactured to your specifications.

LOVELACE RESPIRATORY RES. INST. *Booth 320*

The LRRI offers internationally recognized expertise in aerosol science, exposure assessment, inhalation exposure technology, respiratory tract dosimetry and risk assessment to solve problems related to airborne particles in home, workplace and the environment.

LUDLUM MEASUREMENTS, INC. *Booths 323, 325*

Ludlum Measurements, Inc., manufacturer and designer of instrumentation used to detect and measure nuclear radiation, will be displaying some of the newer products.

MACTEC, INC. *Booth 624*

MACTEC, Inc. provides risk management, engineering, and environmental remediation services as well as remediation technologies, health physics and decontamination/ decommissioning.

MGP INSTRUMENTS, INC. *Booth 211*

MGP Instruments provides a full range of instrumentation and engineering services for health physics applications and radiation monitoring systems for all nuclear facilities.

NATIONAL NUCLEAR CORP. *Booth 223*

NNC manufactures contamination monitors, scrap monitors, and waste monitors. XETEX, a division of NNC, manufactures dosimeters, ratemeters, area monitors, and sample counters. Reactor Experiments, a division of NNC, offers radiation shielding and neutron activation foils and flux wires.

NFS RADIATION PROTECTION SYSTEMS *Booth 611*

Software and systems for radiological record keeping, instrument management and sample management for the nuclear industry.

NILFISK OF AMERICA *Booth 700*

NORTH AMERICAN SCIENTIFIC, INC. *Booths 303, 305*

North American Scientific, Inc. is a manufacturer of radioactive calibration standards and sources for medical, industrial and R&D.

NRRPT *Booth 810*

NSSI *Booth 208*
Radioactive, hazardous, and mixed waste treatment. Tritium recovery. Treatment of high hazard chemicals, gases, and radioactives.

NUCLEAR PLANT JOURNAL *Booth 524*
Nuclear Plant Journal magazine featuring the following topics: health physics and waste fuel management, plant maintenance, outage management, plant services and NDT, decontamination decommissioning and information technology advances.

NUCLEAR RESEARCH CORPORATION *Booths 701, 703*
ADM-300 Emergency Monitoring Equipment, surveying instruments, portal portable monitor, ADM-300X, Global Area Radiation Positioning System (GAROS), systems and custom systems.

OAK RIDGE INSTITUTE FOR SCIENCE AND TECHNOLOGY (ORISE) *Booth 324*
Health Physics Training and Radiological Surveys in Support of Decommissioning.

ORDELA INC. *Booth 720*
Ordela, Inc. offers rapid alpha assay instrumentation for air filters, water, soil, swipe and smear samples. If you look for alphas, count on Ordela.

OUTREACH LABORATORY *Booth 606*

OVERHOFF TECHNOLOGY CORPORATION *Booth 117*
Tritium Monitors for all applications, air, surface, water, process; general line of gamma, beta and neutron detection systems.

OXFORD INSTRUMENTS, INC. *Booths 610, 612*
Oxford Instruments, Inc., Nuclear Measurements Group is a manufacturer of nuclear counting systems. Product lines include gamma and alpha spectroscopy systems, low level alpha and beta counting systems, NIM, and educational counters.

PACIFIC NORTHWEST NATIONAL LAB. *Booth 225*
Health Physics research and development, services and integrated programs. Internal and external dosimetry, instrument calibration and evaluation, radiological records, dosimetry irradiations and accreditations.

PANASONIC INDUSTRIAL COMPANY *Booth 212*
TLD readers and pocket dosimeters.

PERMA-FIX ENVIRONMENTAL SERVICES *Booth 812*

PRINCETON GAMMA-TECH, INC. *Booth 322*
Gamma Spectroscopy Systems.

PRO-TEM, INC. *Booth 200*
Cost effective, client-server information solutions for the Energy Industry. Health Physics products include the ARACS access control system, PRORAD for complete health physics records management, and our Survey Map Utility. Hands-on demonstrations.

PROTEAN INSTRUMENT CORPORATION (PIC) *Booth 308*
Protean Instrument Corporation specializes in a complete line of alpha/beta counting instruments featuring thin window and windowless gas-flow proportional detectors. Products include low-background models with automatic planchet sample changers, manual single-drawer/single detector models and multiple-drawer/multiple-detector models. TRAC air sample system available.

PROXTRONICS, INC. *Booth 113*
Proxtronics, Inc. is a technology services company providing Dosimetry, radiation management and remediation service.

PULCIR, INC. *Booth 221*
Training Simulators

QUANTRAD SENSOR *Booth 316*
Instrumentation and detectors for the detection and analysis of alpha, gamma, x-ray and neutron radiation. New products include the Ranger; for automated isotope identification and the 512 channel Scout.

RADCAL CORPORATION *Booth 625*
Radcal manufactures test equipment to measure dose and other characteristics of diagnostic x-ray machines. See the brand new, non-invasive, kV detector with Accu-kV™ technology at a price breakthrough. See also the inexpensive Skin Dose Monitor.

RADIATION DETECTION CO. *Booth 709*
RDC is managed by the following principles: 1)Integrity, honesty and financial stewardship. 2) Provision of quality Personnel Dosimetry at fair and competitive prices. 3) Establishment of a safe and affirming employment environment offering equal employment opportunity.

RADIATION SAFETY ASSOCIATES *Booth 209*
Radiation consulting services, radiochemical analysis, decontamination and decommissioning, publications (journals and texts) for health physicists.

RADIOLOGICAL TRAINING SERVICES *Booth 120*
Radiation Safety Training Videotapes.

RADOS TECHNOLOGY, INC. *Booth 312*
Rados Technology is one of the leading suppliers of radiation detection and contamination monitoring systems. Our product line includes area monitors, access control systems, telemetry systems, waste measurement systems, and laundry, portal and body monitors.

RESEARCH PRODUCTS INT'L CORP. *Booth 523*
Radiation shields, radiation detectors and monitors, radiation safety supplies.

S. E. INTERNATIONAL, INC. ***Booth 623***
Manufacturers of radiation detection meters, monitors. Handheld, portable instrumentation capable of detecting alpha, beta, gamma and x-rays. Dosimeters, ratemeters, SCA, etc.

SAIC ***Booths 402 404***
SAIC provides a complete line of quality products and services including: RADeCO air samplers, air flow calibrators, portable alpha analyzers, calibration services, alarming dosimeters, personnel contamina-tion monitors, radioiodine sampling cartridges, radiation monitoring systems, training and consulting services.

SCIENTECH - NUS INCORPORATED ***Booth 318***
Live demonstration of the InfoWorks Radiation Protection Management Software including dose tracking, work permitting, access control, and regulatory reporting. Consulting services provided for risk analysis, decommissioning, procedure writing and rad engineering.

SCINTREX LIMITED ***Booth 213***
Radiation monitoring instrumentation, health physics instrumentation, reactor control equipment.

SIEMENS ENVIRONMENTAL SYSTEMS ***Booth 616***
Siemens Environmental Systems designs, manufactures and installs a leading range of electronic dosimetry systems. The line includes access control and dose management software, as well as wireless monitors.

SPECTRUM TECHNIQUES ***Booth 306***
Nuclear training equipment and radioisotope sources.

SYNCHROTECH SYSTEMS, INC. ***Booth 813***
Radiation protection and health physics instruments. Custom systems integrator and distributor for MAB GmbH and ESM-Eberline.

TECHNICAL ASSOCIATES ***Booth 821***
Recent additions to TA's Health Physics instrument line include smarter, more sensitive and more rugged contamination monitors including pipe and plume monitors and iodine and tritium detection systems.

TECHNICAL MANAGEMENT SERVICES, INC. ***Booth 202***
Technical Management Services, Inc. conducts a wide spectrum of health physics short courses at regional locations throughout the country. They also offer customized onsite training at customer locations for 5 or more people.

TELEDYNE BROWN ENGINEERING-ENV. SVCS. ***Booth 815***
Environmental Analysis, Radiological Services, TLD Reader, TLD Materials, TLD Badge Service and Scintillation Detectors.

TGM DETECTORS ***Booth 602***
All types of detectors.

THE INDUS GROUP ***Booth 613***

THERMO NUTECH ***Booth 321***
Thermo NUtech offers environmental radiochemistry, health physics, site assessment, survey, mobile laboratory, soil and site remediation, bioassay and external dosimetry services.

THOMAS GRAY & ASSOCIATES, INC. ***Booth 622***
Processing & disposal of LLRW, mixed waste, sealed sources, NORM & NARM waste, decay in storage, transportation and health physics services.

TVA NUCLEAR RADIOLOGICAL SERVICES ***Booth 210***
Radiological support services for the Nuclear Industry. Services include: Radioanalytical Analyses, Radiological Environmental Monitoring, Instrument Calibration and Repair and External Dosimetry.

US ECOLOGY NMMC ***Booth 609***
Brokerage services including processing and disposal of LLRW and mixed waste, field services including remediation projects.

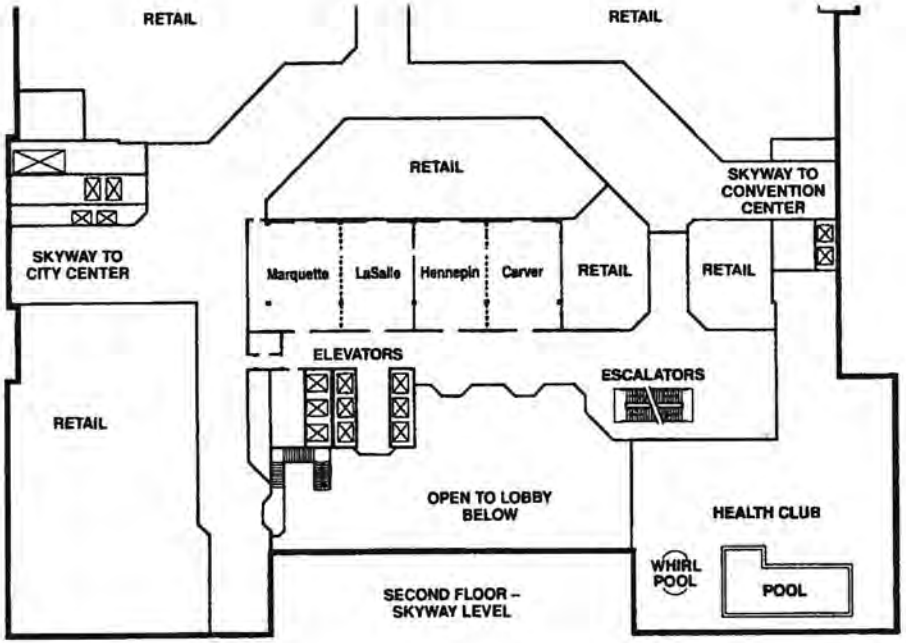
US NUCLEAR REGULATORY COMMISSION ***Booth 525***
The mission of the US Nuclear Regulatory Commission is to ensure adequate protection of the public health and safety, the common defense and security, and the environment in the use of nuclear materials in the United States.

VICTOREEN ***Booths 311, 313***

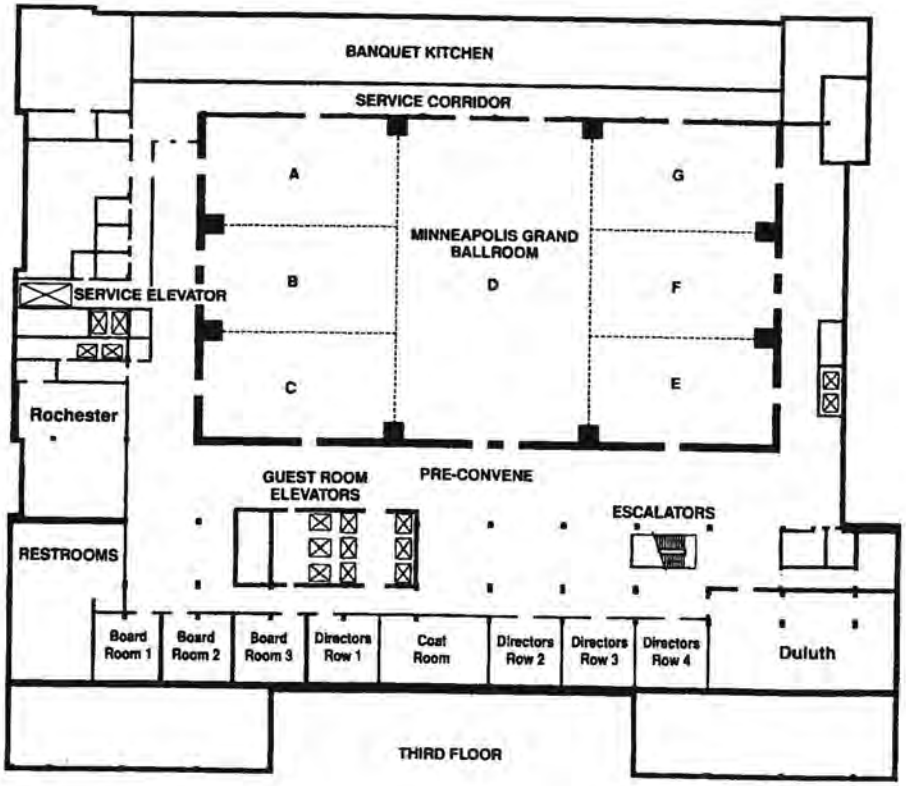
WILLIAMS AND WILKINS ***Booth 109***
Williams & Wilkins is a leading international health science publisher with its headquarters in Baltimore, Maryland. We serve a rapidly expanding group of undergraduate and graduate health science students and a wide range of medical and other health science professionals. Visit the Williams & Wilkins web site at www.wwilkins.com or call toll free to our Customer Service department at 1-800-638-0672.

Author Index

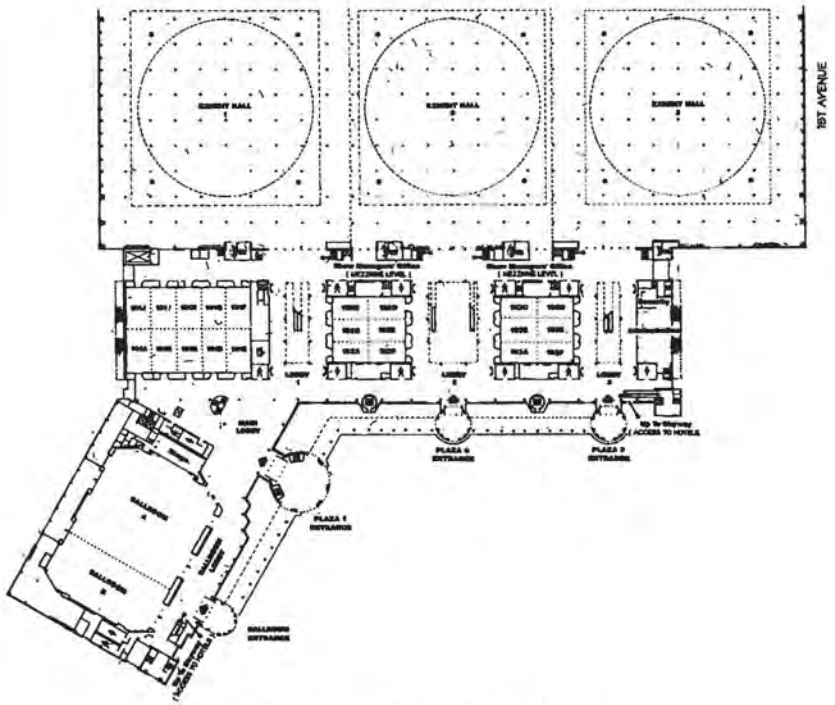
Minneapolis Hilton
2nd Floor Meeting Rooms



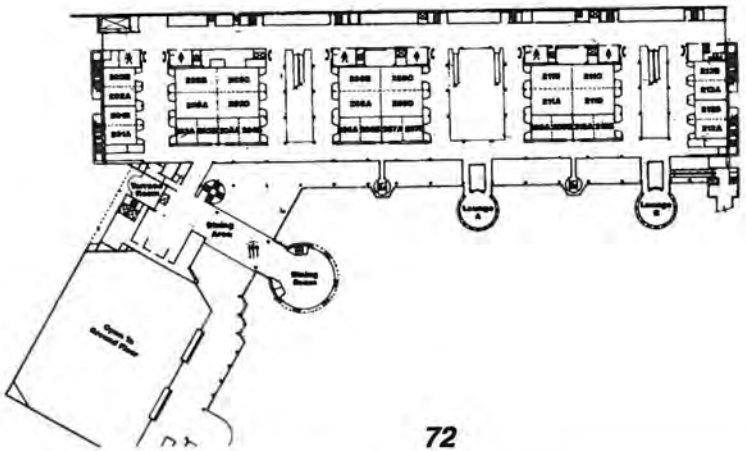
Minneapolis Hilton
3rd Floor Meeting Rooms



Convention Center
1st Floor Meeting Rooms



Convention Center
2nd Floor Meeting Rooms



Saturday, July 11

AAHP1 Human Radiobiology Update
8 am-5 pm *Hilton Hotel, Room: Marquette*

AAHP2 Health Physics Applications of Uranium Toxicity
8 am-5 pm *Hilton Hotel, Room: LaSalle*

AAHP3 Health Physics Aspects of Decontamination & Decommissioning Activities
8 am-5 pm *Hilton Hotel, Room: Salon E*

Sunday, July 12

PEP Courses *Hilton Hotel Rooms: TBA*

1-A thru 1-J 8-10 am
2-A thru 2-J 10:30 am - 12:30 pm
3-A thru 3-J 2-4 pm

Welcome Reception
6:00-7:30 pm *Hilton Salons D/E/F/G*

Unless otherwise noted all events take place in the Convention Center

Monday, July 13

CEL-1 Recent Developments in Radiation Litigation
7:15-8:15 am *101 G/H*

CEL-2 Positioning for Public Acceptance of...
7:15-8:15 am *101 A/B*

ABHP Exam - Part 1
8:30-11:30 am *Hilton, Salons B/C*

MAM-A Plenary Session
8:30 am-Noon *Ballroom A*

Exhibit Hall Opening
Noon-1:30 Lunch *Exhibit Hall*

PEPs - 12:15-2:15 pm

M-1 *201 A/B*
Radiation Dose to the ...

M-2 *202 A/B*
Laser Safety Calculations ...

M-3 *205 A/B*
Statistics and Radioactivity.....

M-4 *205 C/D*
"Quality Mammography. .....

M-5 *208 A/B*
University and Medical.....

M-6 *208 C/D*
How to Design and Run a...

ABHP Exam - Part 2
1-6:30 pm *Hilton, Salons B/C*

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

MPM-A Waste Mgmt. and Decommissioning
3-4 pm *101 G/H*

MPM-B Radiation Safety Program Mgmt.- Lessons Learned from Program...
3-5:30 pm *101 C/D/E*

MPM-C Radon Sect.Sess.: Radon a Problem Solved
3-5:30 pm *101 I/J*

Radon Section Meeting
5:30-6:30 pm *101 I/J*

MPM-D Pwr. Reactor Sect.Sess.
3-5:15 pm *101 A/B*

Power Reactor Section Mtg.
5:15-6:15 pm *101 A/B*

Student Reception
5-6 pm *Hilton, Duluth Room*

Tuesday, July 14

CEL-3 BIER VI Report Update
7:15-8:15 am *101 G/H*

CEL-4 Radiotherapy with Internal Emitters-Current ....
7:15-8:15 am *101 A/B*

TAM-A Student I
8:30 am-Noon *101 G/H*

TAM-B AAHP Session: A Summary of the Wingspread Conference-Part 1
8:30 am-Noon *101 C/D/E*

AAHP Awards Luncheon
Noon-1:30 pm *211 A-D*

TAM-C Radon
8:30-11 am *101 I/J*

TAM-D Accelerator Sect.Sess.
8:30-10:30 am *101 A/B*

Accelerator Section Meeting
10:30-11:30 am *101 A/B*

PEPs - 12:15-2:15 pm

T-1 *201 A/B*
Interlock Design and Testing ....

T-2 *202 A/B*
Performance-Based Assessment...

T-3 *205 A/B*
Final Status Decommissioning...

T-4 *205 C/D*
Current Approaches to...

T-5 *208 A/B*
Methoddology for Compliance ....

T-6 *208 C/D*
New MIRD Techniques for....

TPM-A Student II
2:30-5 pm *101 G/H*

TPM-B AAHP Session: A Summary of the Wingspread Conference-Part 2
1:30-5 pm *101 C/D/E*

AAHP Open Meeting
5-6 pm *101 C/D/E*

TPM-C RSO Sect.Sess.
2:30-3:30 pm *101 I/J*

RSO Section Meeting
4 pm *101 I/J*

TPM-D Environmental
2:30-4:30 pm *101 A/B*

Wednesday, July 15

CEL-5 Applying Radiation Safety's Approach to ....
7:15-8:15 am *101 G/H*

CEL-6 False Alarms, True Alarms, and Statistics: Correct....
7:15-8:15 am *101 A/B*

WAM-A Risk Analysis
8:30-11:30 am *101 G/H*

WAM-B Radioactive Materials in the Public Domain
8:30-10:45 am *101 C/D/E*

WAM-C Decom. Sect.Sess.
8:30-11 am *101 I/J*

Decommissioning Sect. Mtg.
11 am-Noon *101 I/J*

WAM-D Medical HP
8:30-10:30 am *101 A/B*

Medical Section Meeting
10:30-11:30 am *101 A/B*

PEPs – 12:15-2:15 pm

W-1 *201 A/B*
Communicating Health Physics

W-2 *202 A/B*
Statistical Considerations for...

W-3 *205 A/B*
Final Status Decommissioning...-Part 2

W-4 *205 C/D*
Cellular Defense Mechanisms...

W-5 *208 A/B*
Uses and Abuses of Models in...

W-6 *208 C/D*
Radiochemistry Practices and...

Chapter Council Meeting
1-2:30 pm *101 G/H*

WPM-A NCRP
2:30-5 pm *101 G/H*

WPM-B Operational HP
2:30-4:45 pm *101 C/D/E*

WPM-C Environ. Sect.Sess.
2:30-4:30 pm *101 I/J*

Environmental Section Mtg.
4:30-5:30 pm *101 I/J*

WPM-D Dosimetry: Internal and External
2:30-5 pm *101 A/B*

HPS Annual Business Mtg.
5-6 pm *101 A/B*

WPM-E Aerosol Measure.
6-8 pm *Hilton;Duluth Room*

Thursday, July 16

CEL-7 The Evidence For and Against the Linear-No-Threshold Theory
7:15-8:15 am *101 G/H*

CEL-8 Upgrading Your Knowledge of Health Physics Use of the Internet or "Spiders and Cookies and Bots - Oh My..." Tales and Tools From Cyberspace
7:15-8:15 am *101 A/B*

THAM-A MARSSIM
8:30-11:30 am *101 G/H*

Government Section Business Meeting
11:30 am *101 G/H*

THAM-B Training and Communication
8:30-9:45 am *101 C/D/E*

THAM-C Regulatory/Legal Issues
8:30-10 am *101 I/J*

HPS Awards Luncheon
12:30-2:30 pm - *Hilton, Salons D/E/F/G*

PEPs – 3-5 pm

TH-1 *201 A/B*
Air Sampling Environmental Radioactivity

TH-2 *202 A/B*
Mitigating Radiation Dose to Patient and Staff During Extended Time Fluoroscopic X-Ray Procedures

TH-3 *205 A/B*
Environmental Radioactivity & Public Health

TH-4 *205 C/D*
A Field Perspective for Incorporating 10 CFR 835 Requirements...

Registration Hours

Saturday 3-6 pm
Minneapolis Hilton

Sunday 7 am-7 pm
Minneapolis Hilton

Monday 8 am-4 pm
Convention Center

Tuesday 8 am-4 pm
Convention Center

Wednesday 8 am-4 pm
Convention Center

Thursday 8 am-Noon
Convention Center

Exhibit Hall Hours

Convention Center

Monday Noon-5 pm
Free lunch for registered attendees

Tuesday 9:30 am-5 pm

Wednesday 9:30 am-4 pm

Breaks during the Week

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!