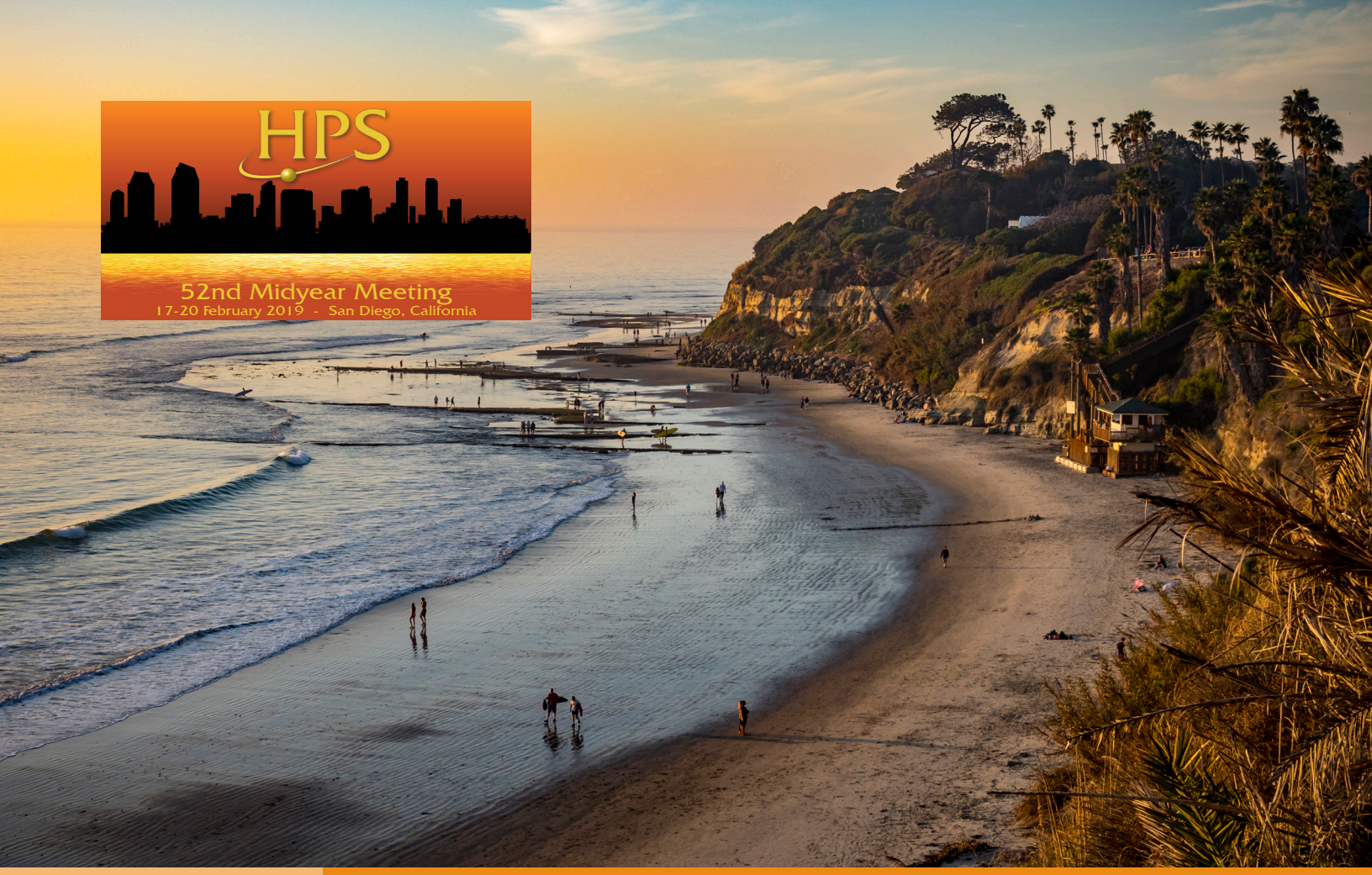

2019

Health Physics Society
52nd Midyear Meeting

17-20 February 2019 · San Diego, California

Sheraton San Diego Hotel & Marina

FINAL PROGRAM

HPS | AAHP | USA CAN NRRPT | ABHP

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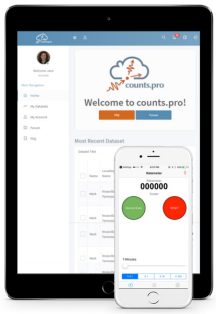

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52nd Midyear Meeting

Health Physics Society

Sheraton San Diego Hotel & Marina · 17-20 February 2019 · San Diego, CA

The 2019 Midyear Meeting
is presented by the
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Registration Hours

Grande Ballroom Foyer

Sunday 17 February
3:30 PM-5:30 PM

Tuesday 19 February
8:00 AM-3:00 PM

Monday 18 February
7:30 AM-3:00 PM

Wednesday 20 February
8:00 AM-11:30 AM

Exhibit Hours

Grande Ballroom

Monday

10:00 AM-6:30 PM . . . . . Exhibits Open
10:00 AM-10:30 AM . . . . . Coffee Break
Noon-1:15 PM . . . . . Complimentary Lunch
2:45 PM-3:15 PM . . . . . Coffee Break
Sponsored by Hi-Q Environmental Products Co.
5:00 PM-6:30 PM . . . . . Exhibitor Reception/ Poster Reception

Tuesday

9:30 AM-4:00 PM . . . . . Exhibits Open
10:00 AM-10:45 AM . . . . . Coffee Break
Noon-1:15 PM . . . . . Complimentary Lunch
3:00 PM-4:00 PM . . . . . Coffee Break

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Internet: www.HI-Q.net

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- Custom Product & System Design
- TEDA Impregnated Carbon Cartridges

HPS COMMITTEE MEETINGS

All Committee Meetings are in the Sheraton San Diego Hotel & Marina

Saturday 16 February 2019

NRRPT Board and Panel
9:00 am – 4:00 pm — Marina 6

Finance and Executive Committee Meeting and Lunch
12:00 pm – 5:00 pm — Room 514

Board Reception
6:00 pm – 7:30 pm — President's Suite

Sunday 17 February 2019

HPS Board Meeting
8:00 am – 5:00 pm — Marina 4

AAHP Executive Committee
8:00 am – 5:00 pm — Room 415

NRRPT Board and Panel
9:00 am – 4:00 pm — Marina 6

Program Committee Meeting
10:00 am – 12:00 pm — Maritime Boardroom

Monday 18 February 2019

NRRPT Board and Panel
9:00 am – 4:00 pm — Marina 6

Scientific and Public Issues Committee
2:00 pm – 3:30 pm — Room 511

Speaker Ready Room

Marina 5

Sunday . . . . . 3:00 PM – 5:00 PM
Monday . . . . . 8:00 AM – 5:00 PM
Tuesday . . . . . 8:00 AM – 5:00 PM
Wednesday . . . . . 8:00 AM – 10:00 AM

Tuesday 19 February 2019

Ludlum's calibration concepts (hands-on) with an overview of the new digital line
(open to registered HPS attendees)
8:30 am – 5:30 pm — Spinnaker

NRRPT Board and Panel
9:00 am – 4:00 pm — Marina 6

NCRP PAC-2 Meeting
1:00 pm – 2:00 pm — Room 511

PRS Business Meeting
1:00 pm – 2:00 pm — Room 514

Wednesday 20 February 2019

Program Committee Lunch
12:00 pm – 1:00 pm — Room 518

IRPA Medical Radiation Safety Culture Workshop
1:30 pm – 5:00 pm — Spinnaker

Thursday 21 February 2019

IRPA Medical Radiation Safety Culture Workshop
8:30 am – 4:30 pm — Harbor's Edge Restaurant

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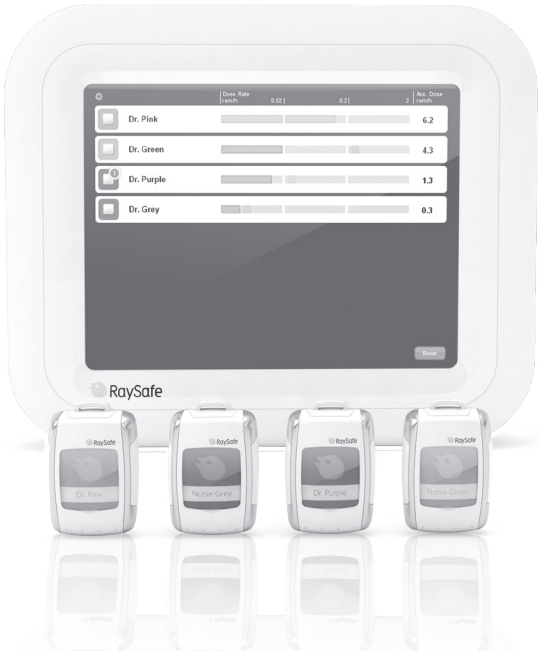
- Instant feedback: empowers medical staff to learn and adapt behavior to minimize unnecessary radiation exposure



Visit **landauer.com** or **raysafe.com** to learn more about our products and services.

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SOCIAL EVENTS

All Social Events are in the
Sheraton San Diego Hotel & Marina

Sunday 17 February 2019

Welcome Reception
6:00 PM – 7:30 PM Harbor Island 3
Plan on attending the HPS Welcome Reception. This is an opportunity to meet friends and start your evening in San Diego. Cash bar and light refreshments will be available during the reception.

Monday 18 February 2019

Complimentary Lunch in Exhibit Hall
Noon – 1:15 PM Grande Ballroom

Poster Session
5:00 PM – 6:30 PM Grande Ballroom

Exhibitor Reception
5:00 PM – 6:30 PM Grande Ballroom
Join the exhibitors for food, a cash bar, and the latest in health physics equipment.

Tuesday 19 February 2019

Complimentary Lunch in Exhibit Hall
Noon – 1:15 PM Grande Ballroom

Congratulations to our
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Dade Moeller Lectureship
Dr. Luis Benevides

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Medical Physics and Radiation Safety

BRONZE

JL SHEPHERD & ASSOCIATES

2019 HPS MIDYEAR MEETING EXHIBITORS

Exhibits are located in the Sheraton San Diego Hotel & Marina, Grande Ballroom

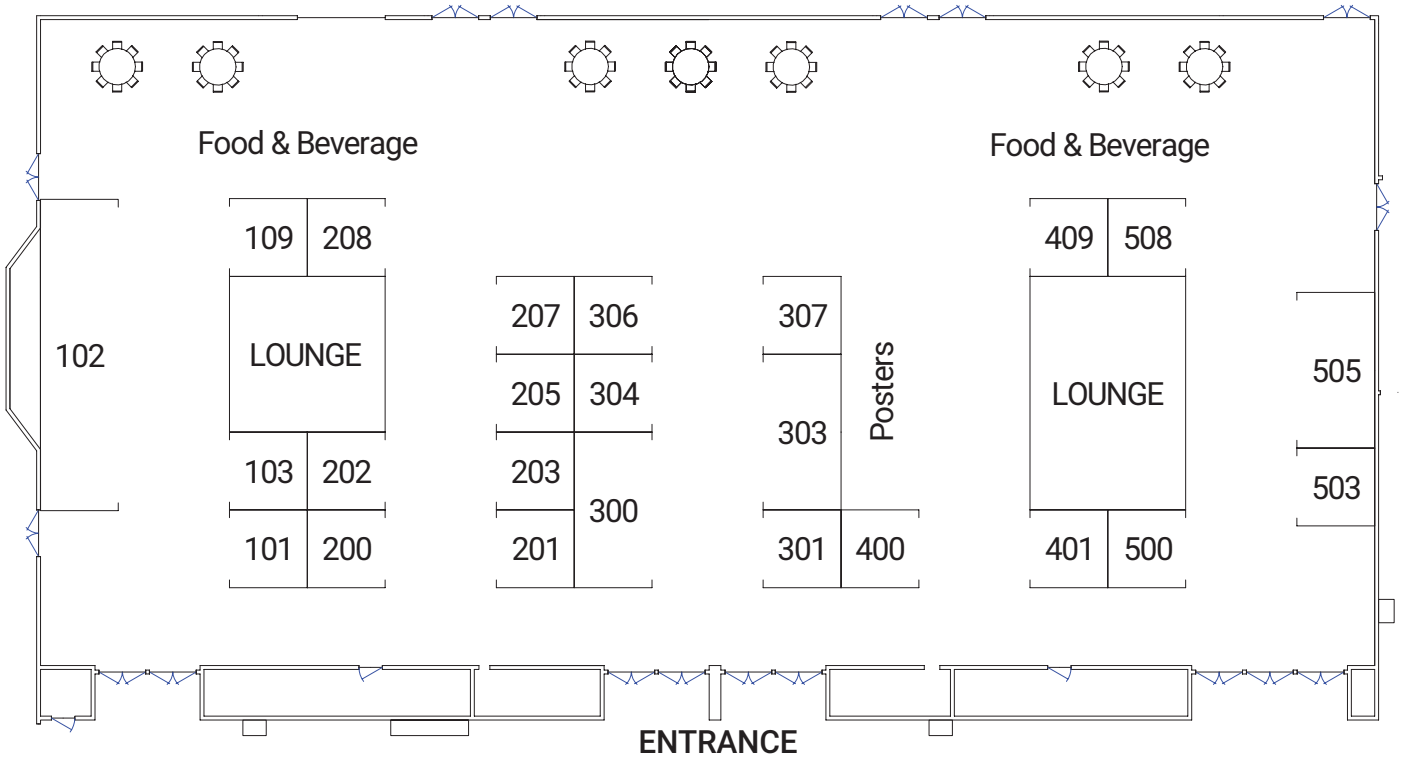

Exhibit Hours

Monday

10:00 AM – 6:30 PM
Exhibits Open

10:00 AM – 10:30 AM
Coffee Break

Noon – 1:15 PM
Complimentary Lunch

2:45 PM – 3:15 PM
Coffee Break
Sponsored by Hi-Q Environmental Products Co.

5:00 PM – 6:30 PM
Exhibitor Reception/
Poster Session

Tuesday

9:30 AM – 4:00 PM
Exhibits Open

10:00 AM – 10:45 AM
Coffee Break

Noon – 1:15 PM
Complimentary Lunch

3:00 PM – 4:00 PM
Coffee Break

2019 HPS MIDYEAR MEETING EXHIBITORS

Exhibits are located in the Sheraton San Diego Hotel & Marina, Grande Ballroom

2019 Annual Meeting Orlando, Florida — Booth: 101

www.hps.org/meetings

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Bionomics — Booth: 301

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www.chaseenv.com

Chase Environmental' s Radiological Services Group is dedicated to servicing smaller quantity generators of low level and mixed radioactive waste – as well as providing remediation and license termination needs of a wide range of clients. Additionally – we provide a dedicated consulting service for industrial type clients who either use radioactive materials in their process – or who wish to prevent the introduction of radioactive materials to their processes. We go to great lengths to ensure quality, compliance, safety and value at every point in the process – while providing a great customer service experience. For more information – or to request a quote for services please contact John O'Neil at 877-389-2124 or joneil@chaseenv.com.

CHP Consultants/ CHP Dosimetry — Booth: 202

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Booth: 300

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HI-Q Environmental Products Company is an ISO 9001:2015 Certified designer/manufacturer that has been providing air sampling & monitoring equipment, systems and services to the nuclear and environmental monitoring industries since 1973. Our product line ranges from complete stack sampling systems to complex ambient air sampling stations. Our product catalog includes: Continuous duty high & low volume air samplers, radiation measurement instrumentation, radiation monitoring systems, air flow calibrators, radioiodine sampling cartridges, collection filter paper and both paper-only or combination style filter holders. Along with the ability to design complete, turn-key, stack and fume hood sampling system, HI-Q has the unique capability to test ducts and vent stacks as required by ANSI N13.1-1999/2011.

HPS Journal/Newsletter

Booth: 303

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J.L. Shepherd & Associates

Booth: 306

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LabLogic Systems, Inc

Booth: 201

1911 N US Highway 301
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813-626-6848
www.lablogic.com

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Mirion Technologies — Booth: 102

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NV5-Dade Moeller — Booth: 304

1835 Terminal Drive, Suite 200
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509-946-0410
www.NV5.com

NV5-Dade Moeller, provides professional and technical services to government and commercial clients in radiological and nuclear safety, public and worker protection, and environmental project operations. We have experience in a wide range of disciplines, including health physics, industrial hygiene, occupational safety, training, environmental services, infrastructure, engineering and program management.

ORTEC — Booth: 508

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865-483-2124
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Radiation Safety & Control Services Inc (RSCS) — Booth: 401

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RSCS offers expertise in all aspects of radiation safety and measurement applications. We specialize in operational and decommissioning services for nuclear, industrial, medical, and government radiological facilities. Our services include health physics consulting, technical staffing, training, instrumentation (sales, installation, calibration, and repair), emergency planning, and specialized radiological characterizations and measurements.

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281-291-7769
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Thomas Gray & Associates, Inc. — Booth: 103

1205 West Barkley Avenue
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714-997-8090
www.tgainc.com

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Versant Medical Physics and Radiation Safety — Booth: 109

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888-316-3644
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FINAL TECHNICAL PROGRAM

If a paper is going to be presented by other than the first author, the presenter's name has an asterisk (*)
All Sessions will take place in the Sheraton San Diego Hotel & Marina

MONDAY

7:15 AM – 8:15 AM — Spinnaker

CEL-1
The Case Against LNT
Fellman A
NV5

7:15 AM – 8:15 AM — Marina 3

CEL-2
Dosimetry Challenges of New Nuclear Medicine Theranostic Agents
Stabin M
RADAR, Inc.

8:30 AM – 12:00 PM — Harbor Island 3

MAM-A
Plenary Session

8:30 AM **MAM-A.0**
Introduction
HPS President Nolan Hertel

8:40 AM **MAM-A.1**
An IRPA, WHO, IOMP Initiative on Radiation Safety Culture in Health Care
le Guen B
IRPA

9:20 AM **MAM-A.2**
Enhancing Safety and Quality When Using Radiation In Medicine – WHO's Views and Actions
del Rosario Pérez M
World Health Organization

10:00 AM COFFEE BREAK
Grande Ballroom

10:30 AM **MAM-A.3**
Radiation Safety in Healthcare
Gress D
American College of Radiology

11:00 AM **MAM-A.4**
Deterministic Opportunities and Stochastic Journeys: A Career in the Armed Services as a Physicist
Benevides L
US Navy

11:40 AM
Q&A Session

1:30 PM – 5:00 PM — Harbor Island 3

MPM-A
NCRP: Special Session;
Military Health Physics, Part 1
Chairs: John Cuellar, Daniel Sowers

1:30 PM **MPM-A.1**
Navy Health Physics: A 27 Minute History From Manhattan to DHA
Sowers D
NAVSEA DET RASO

2:00 PM **MPM-A.2**
Army Contributions to Early Health Physics; 1858 to 1977
*Komp GR, Mikulski H**
GK Technical Services, US Army

2:30 PM **MPM-A.3**
The VA Ionizing Radiation Registry Program
McClung DK
US Department of Veterans Affairs

3:00 PM COFFEE BREAK
Grande Ballroom

3:30 PM **MPM-A.4**
Radiation Advisory Medical Teams
VanHorne-Sealy J
US Army

4:00 PM **MPM-A.5**
Defense Health Agency – Establishing a Master Material License with the Nuclear Regulatory Commission
Stewart HM
Defense Health Agency

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

HP Roles at the New DHS CWMD Office

Reyes R
DHS

5:00 PM – 6:30 PM **Grande Ballroom**

Exhibitor Reception

Join the exhibitors for food, a cash bar, and the latest in health physics equipment.

5:00 PM – 6:30 PM **Grande Ballroom**

Poster Session

P.1 An Innovative Approach to Legacy Uranium Mining Hazard Communication

Wier BA, Charley PH, Johnson TE, John G, Wier B
Colorado State University, Dine College

P.2 Chronic Low Dose Radiation Affects Locomotion In Drosophila Melanogaster Larvae In A Non-Linear, Dose-Dependent Manner

Gee S, Borrego M, Zornik E
Reed College

P.3 X-ray Backscatter Modelling for Quantitative X-ray Fluorescence Microscopy Studies

Lopez A, Gherase M
Cal State Univ- Fresno

TUESDAY

7:15 AM – 8:15 AM **Harbor Island 3**

CEL-3
Fundamentals of Environmental Health Physics
Whicker JJ

7:15 AM – 8:15 AM **Spinnaker**

CEL-4
Personnel Contamination Monitoring the 411
Googins SW
Radiation Safety & Control Services Inc.

8:30 AM – 12:00 PM **Harbor Island 3**

TAM-A
NCRP: Special Session; Military Health Physics, Part 2
Chairs: Alan Hale, Jama VanHorne-Sealy

8:30 AM **TAM-A.1**
Recent Updates to Technical Guide 236: Radiological Area Survey – A Field Guide
Livingston BE
US Army

9:00 AM **TAM-A.2**
Exposure Limit Deviations for the Solid State – Active Denial Technology
Frey JF, Lamoreaux RW
US Army Materiel Command, US Army Armament Research, Development, and Engineering Center

9:30 AM **TAM-A.3**
Explanation of the DOD Policy on the Turn-In of Radioactive Items of DOD Origin Found in the Public Domain
Kurth MF
Department of Defense

10:00 AM COFFEE BREAK
Grande Ballroom

10:30 AM **TAM-A.4**
Update on Machine Based Irradiation Versus Gamma Irradiators for Blood Irradiation within Department of Defense (DoD)
Mikulski HT, Belin TR
US Army

10:45 AM **TAM-A.5**
The Management and Control of Radioactive Material in the US Air Force
Bhat RK, Hale AC, Nemmers SA, Gulley TL, Mccomb BA, Murren BA, Cessor-Culver DJ
US Air Force

11:00 AM **TAM-A.6**
Army Radiation Program and the U.S. Army Center of Military History
Habiba K, Mikulski TH
US Army Office of the Director of Army Safety

11:15 AM **TAM-A.7**
Radiation Safety and Detector Response Considerations for Army Pulsed X-ray Systems Used in Nondestructive Inspection Operations
Frey JJ, Borisky MJ, Livingston BE, Arguello DW
U.S. Army Materiel Command, Army Research Laboratory, Army Public Health Center, 20th Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Command

11:30 AM **TAM-A.8**
Update of the Army Radiation Program
Mikulski HT
US Army

11:45 AM **TAM-A.9**
Armed Forces Radiobiology Research Institute – Current Activities and Update
Burke GF

12:00 PM COMPLIMENTARY LUNCH
Grande Ballroom

1:30 PM – 4:15 PM **Harbor Island 3**

TPM-A
Dosimetry/Medical Physics
Chair: Alan Fellman

1:30 PM **TPM-A.1**
Development of High-Throughput Gamma-H2AX Assay Using Imaging Flow Cytometry
Wang Q, Lee Y, Shuryak I, Repin M, Perrier J, Taveras M, Brenner DJ, Turner HC
Columbia University Medical Center

1:45 PM **TPM-A.2**
Misleading Approaches Used To Defend The Linear Non-Threshold Hypothesis
Fellman A
NV5 Dade Moeller

2:00 PM **TPM-A.3**
Protein Biomarkers for Assessment of Radiation Exposure in the Hematopoietically Humanized Mouse Model
Turner HC, Lee Y, Wang Q, Pujol Canadell M, Taveras M, Perrier JR, Chen EI, Smilenov LB, Shuryak I, Brenner DJ
Columbia University, New York

2:15 PM **TPM-A.4**
A Direct Comparison of Biodosimetry and Physical Dosimetry Techniques for Possible Triage Application
Sholom S, Balajee A, McKeever SW
Oklahoma State University, Oak Ridge Associated Universities

2:30 PM **TPM-A.5**
Kinetic Simulations Predict the Presence of Dose-Rate Effects in the Thermoluminescence of LiF:Mg,Ti (TLD-100)
Ginsburg D, Eliyahu I, Oster L, Reshes G, Horowitz YS, Biderman S*
Ben Gurion University of the Negev, Soreq Nuclear Research Center, Sami Shamoon College of Engineering, Nuclear Research Center Negev

2:45 PM **TPM-A.6**
EPR Dosimetry in Human Fingernail, Part 1: Origin of Endogenous Signal
Tkatchenko N, Romanyukha A, Reyes R, Swarts SG, Gourier D, Trompier F*
Institut de Radioprotection et de Sûreté Nucléaire, Naval Dosimetry Center, Uniformed Services University of the Health Sciences, University of Florida, Institut de Recherche de Chimie de Paris

3:00 PM COFFEE BREAK
Grande Ballroom

3:30 PM **TPM-A.7**
Combining High-Throughput Robotics and Imaging Flow Cytometry to Perform the Micronucleus Assay for Triage Radiation Biodosimetry
Wang Q, Rodrigues MA, Repin M, Beaton-Green LA, Pampou S, Perrier J, Brenner DJ, Turner HC, Wilkins RC*
Columbia University Medical Center, MilliporeSigma, Consumer and Clinical Radiation Protection Bureau, Health Canada

3:45 PM **TPM-A.8**
A Health Physicist's Perspective of Medical Uses of Lasers and Ionizing Radiation
Rogers JM

4:00 PM **TPM-A.9**
Simulation of the Effect of Post-Irradiation Optical Excitation on the Dose Response of Thermoluminescent LiF:Mg,Ti (TLD-100)
Ginsburg D, Eliyahu I, Oster L, Reshes G, Horowitz YS, Biderman S*
Ben Gurion University of the Negev, Soreq Nuclear Research Center, Sami Shamoon College of Engineering, Nuclear Research Center Negev

WEDNESDAY

8:30 AM – 12:00 PM **Harbor Island 3**

WAM-A
Contemporary Health Physics Issues, Part 1
Chairs: Frazier Bronson, Carolyn McKenzie

8:30 AM **WAM-A.1**
Occupational Radiation Protection Aspects of Alkaline Leach Uranium in Situ Recovery (Isr) Facilities in the United States
Brown SH

8:45 AM **WAM-A.2**
Advantages and Limitations of GPS-Based Gamma Surveys
Schierman M, Ruedig E
ERG

9:00 AM **WAM-A.3**
Performance Comparisons Between SrI2 Gamma Spectroscopy Scintillators and Other Improved-resolution Detectors for Typical Health Physics Applications
Bronson F
Mirion Technologies - Canberra

9:15 AM **WAM-A.4**
Compliance Issues Associated with Use and Operation of Non Medical X-ray Devices at a Univsrsity
Tarantino C
Radiation Regulatory Specialists

9:30 AM **WAM-A.5**
TENORM from Rare Earths Production – Items for Future Consideration
Egidi PV
U.S. EPA

9:45 AM **WAM-A.6**
Successful Experience in Migrating from Radioactive Irradiators to X-ray Irradiators for Blood and Medical Research Applications
Kamen J
Icahn School of Medicine at Mount Sinai

10:00 AM COFFEE BREAK
Ballroom Foyer

10:30 AM **WAM-A.7**
Community Exercise in Radiological Emergency Response
Mohammad S, Tamez A, Everett S*
University of Texas Southwestern Medical Center

10:45 AM **WAM-A.8**
University of California System-wide Approach to Permanent Reduction of Cesium Irradiators
MacKenzie CJ, Smith KB
University of California

11:00 AM **WAM-A.9**
Cesium Irradiator Replacement Project
Meng RA
Columbia University

11:15 AM **WAM-A.10**
A Novel Method for Quick Assessment of Internal Radiation Exposure in the Aftermath of a Large Radiological Incident
Karam PA, Korir G, Karam A
Mirion Technologies, Radsafe Technologies Ltd

11:30 AM **WAM-A.11**
Study on Continuous Measuring Technique for Radon-in-water Concentration Based on Extraction Membrane
Wang Y, Zhang L, Wang J, Guo Q
Peking University, State Key Laboratory of NBC Protection for Civilian

11:45 AM **WAM-A.12**
Detecting a Small Beta Activity in a Large Gamma Background
Nieves A, Brown K
University of Pennsylvania

12:00 PM LUNCH ON YOUR OWN

8:30 AM – 12:00 PM **Spinnaker**

WAM-B
Special Session: Medical Health Physics
Chairs: John Hough, William Pavlicek

8:30 AM **WAM-B.1**
Experience with a Peak Skin Dose Tracking System at Mayo Clinic
Pavlicek W, Nelson K, Tannahill G
Mayo Clinic

9:00 AM **WAM-B.2**
Reducing Patient Skin Dose with Fluoroscopy; Controllable versus Uncontrollable Factors
Pavlicek W, Nelson K, Tannahill G
Mayo Clinic

9:30 AM **WAM-B.3**
A Monte Carlo Model for the Evaluation of Shadow Shields used in Special Procedures and Cardiac Cath Labs
Metzger RL
Radiation Safety Eng, Inc

10:00 AM COFFEE BREAK
Ballroom Foyer

10:30 AM **WAM-B.4**
Reducing Physician Operator Exposures with Fluoroscopy
Pavlicek W, Nelson K, Tannahill G
Mayo Clinic

11:00 AM **WAM-B.5**
Fluoroscopy Safety – Physician, Technologist and Nursing Staff Training and Competencies
Pavlicek W, Nelson K, Tannahill G
Mayo Clinic

11:30 AM **WAM-B.6**
Estimation of Annual Occupation Dose from Cumulative Air Kerma Usage in Fluoroscopy
Gougy J
Swedish Medical Center

12:00 PM LUNCH ON YOUR OWN

1:30 PM – 4:30 PM **Harbor Island 3**

WPM-A
Contemporary Health Physics Issues, Part 2
Chairs: John Hageman, Tracy Ikenberry

1:30 PM **WPM-A.1**
Mobile Facility for Preparing Category 3 - 5 Sealed Sources for Deep Borehole Disposal
Hageman JP, Miller JJ
Consultant, International Isotopes, Inc

1:45 PM **WPM-A.2**
Decommissioning of Particle Accelerators
Vylet V
Jefferson Lab

2:00 PM **WPM-A.3**
Use of Scaling Factors to Account for Alpha Emitters during Power Plant Decommissioning
Van Der Karr MT
EnergySolutions

2:15 PM **WPM-A.4**
NORM Total Alpha Surface Radioactivity Thresholds for Clearance of Personal Property
Ikenberry T, Schofield W, Millsap J
NV5 & MSA, LLC

2:30 PM **WPM-A.5**
Improving Value to HPS Stakeholders: Engaging Presentations
Mahathy JM
ORAU

2:45 PM **WPM-A.6**
Demonstration of a Field Alpha Spectrometry Tool and Polymer-Ligand Extractant for Fast Actinide Analysis of Fused Glass Samples
Plionis AA, Rim JH, Hoteling NJ, Guise RE
Nevada National Security Site, Remote Sensing Laboratory, Los Alamos National Laboratory

3:00 PM COFFEE BREAK
Ballroom Foyer

3:30 PM **WPM-A.7**
Dynamic Gamma Spectral Measurements of Primary Coolant Piping at Various Operating Nuclear Power Plants
Bronson F
Mirion Technologies - Canberra

3:45 PM **WPM-A.8**
Evaluation Of Skyshine Contributions During Electron Injection At A Synchrotron Facility Using CERN's FLUKA Code
Hastings AD, WIlson IV CA, Hamideh AM, Wang WH
Louisiana State University

4:00 PM **WPM-A.9**
Thorium Molten Salt Reactors (TMSR): Key Radiation Protection Challenges
Sun C
USNRC

4:15 PM **WPM-A.10**
Armed Forces Radiobiology Research Institute – Training Program Review
Divis JA

1:30 PM – 5:00 PM **Spinnaker**

WPM-B
IRPA Special Session on Radiation Safety Culture in Medicine

(co-sponsored by HPS)

Chair: Steve King

1:30 PM
Opening & Introduction

2:00 PM
Plenary Session 1: The worldwide Importance of Radiation Safety Culture in Healthcare

2:30 PM COFFEE BREAK
Ballroom Foyer

3:00 PM
Plenary Session 2: Organizations' Views & Actions on RSCHC Global, Regional & National Perspectives

4:30 PM
Plenary Session 3: Stakeholders' Views Five key Issues for Developing a RPCM

THURSDAY

9:00 AM – 4:00 PM Harbor's Edge Restaurant

IRPA Special Session on Radiation Safety Culture in Medicine

(co-sponsored by HPS)

Chair: Steve King

9:00 AM
Morning introduction and expected outcomes, working procedure

9:30 AM
Break-out group sessions: Establishing RP culture in medicine

- Explanation to the plenary on break out group composition and working procedures
- Three groups will identify the key elements to be considered in the process of establishing and maintaining RSCHC, and will propose a preliminary framework for the future development of the guidance document.
- Topics to be addressed:
  1. Key elements for establishing and developing a radiation safety culture in health care (RSCHC)- general approach
  2. Particular considerations for building a strong radiation safety culture in paediatric imaging
  3. How to engage patients/parents in RSCHC improvement?
  4. Strengths, weaknesses, opportunities & threats for improving RSCHC in Africa (SWOT analysis)
  5. Tools and indicators for assessing RSCHC
     - Wrap-up, preparation of the report to the plenary

10:30 AM COFFEE BREAK

THANK YOU
to Versant Medical Physics
and Radiation Safety
for their support of this session.

11:00 AM
Break-out group sessions: Establishing RP culture in medicine (continued)

12:00 PM LUNCH ON YOUR OWN

1:30 PM
Plenary Session 4: Reports from the break-out groups
One rapporteur from each group will provide feedback from the breakout sessions including a summary of discussions & conclusions, key factors and framework proposed by the group, suggestions.

- Report from groups
- Q & A + discussion

2:15 PM
Plenary Session 5: Towards the development of a guidance document
Facilitated open discussion on the framework for establishing and maintaining RSCHC. Topics for discussion:

- Key elements in the framework
- Guidance document
  - Scope, purpose, target audience
  - Content outline, structure, format, language/s
  - Related products (leaflets, implementation tools, check-lists)
- Next steps, concluding remarks

4:00 PM
Final questions and answers

AMERICAN ACADEMY OF HEALTH PHYSICS

Saturday, 16 February 2019 • Sheraton San Diego Hotel & Marina

AAHP Course #1

8:00 AM – 5:00 PM

Harmony in Concepts and Units for Internal Dose Calculations for Nuclear Medicine Applications or for Protection of Radiation Workers

Michael Stabin, PhD, CHP; RADAR, Inc.

Location: Marina 3

Internal dose calculations for nuclear medicine applications or for protection of radiation workers are based on the same fundamental concepts and units. The various systems developed to provide a basis for the needed calculations (e.g. ICRP 30/60/103, MIRD, RADAR) use equations that appear to be different, but are in fact identical when carefully studied.

The RADAR method harmonized the defining equations and units employed to provide quantitative analysis for these two general problem areas. This program will show, from a theoretical standpoint, how all of these systems are identical in concept, and will then show, using practical examples, how each is applied to solve different problems. For nuclear medicine, an overview will be given of the current state of the art and promise for future improvements to provide more patient specificity in calculations and better ability to predict biological effects from calculated doses. For occupational applications of internal dosimetry, an overview will be given of currently applicable models and methods for bioassay analysis and dose assessment, showing several practical examples.

AAHP Course #2

1:00 PM – 5:00 PM

Practical External Dosimetry Management

Tosh Ushino, CHP; MJW Corp

Location: Marina 4

This course addresses practical management of external dosimetry program. We will review the fundamentals of radiation interactions, radiation sources, and detector theory. We will discuss different types of dosimeters (passive and active), their characteristics, and how radiation interacts with them. In additional to the standard dosimeter badges for beta, gamma and x-ray radiation, the course will cover dosimeters for neutron, eye, and extremity. The course will also present multi-badging and EDE calculations.

The course will discuss potential sources of errors, dose investigations, dose assignment and documentation, how radiation dosimetry services work, and Do-It-Yourself-Quality Assurance. Example investigations are presented and discussed. If time permits, the course will also cover use of the Varskin code for calculating shallow dose from contamination.

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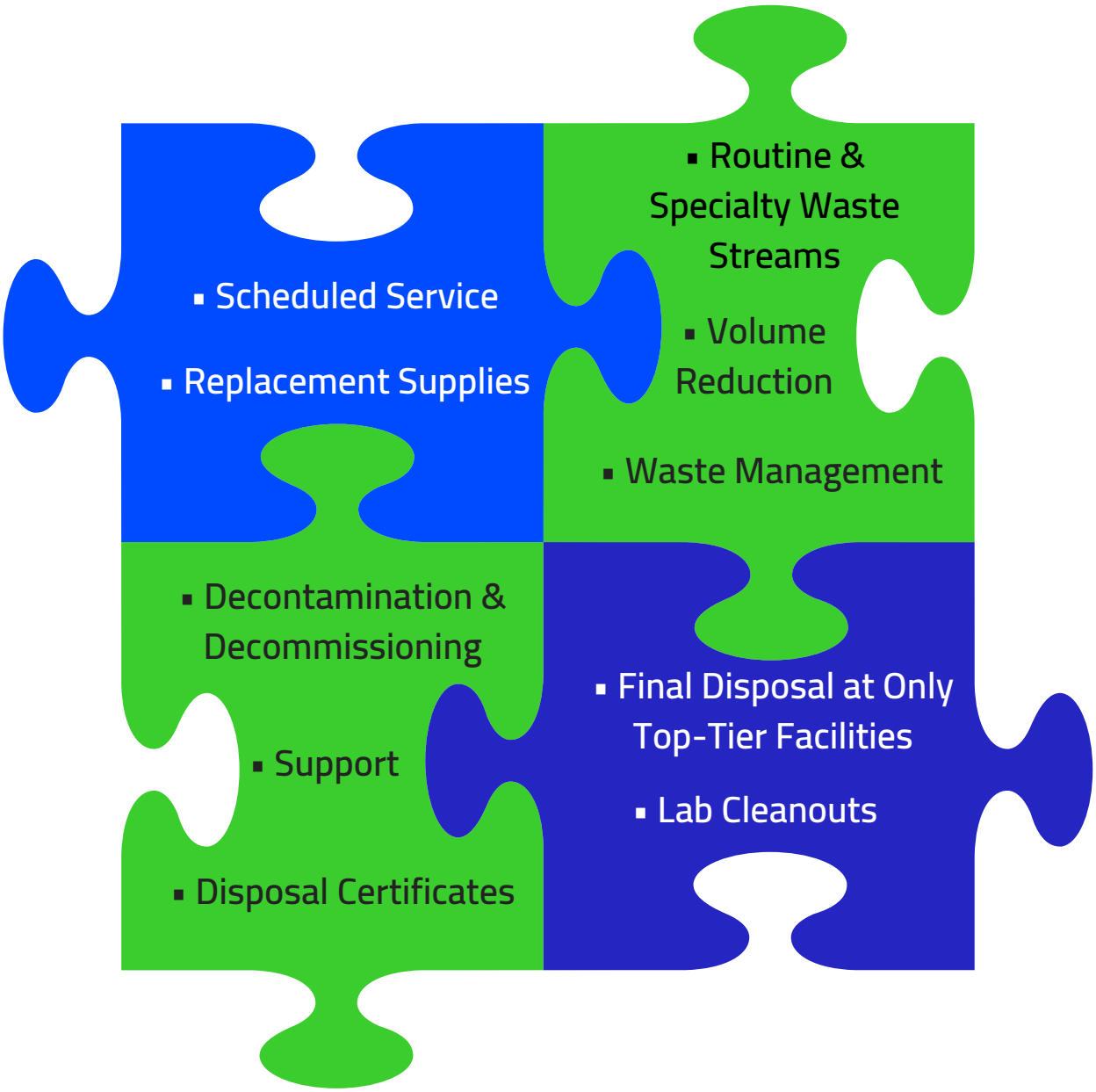

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PROFESSIONAL ENRICHMENT PROGRAM (PEP)

Sunday, 4 February 2018 • Sheraton San Diego Hotel & Marina

Sunday 8:00 AM – 10:00 AM

1-A Evaluation or MARSSIM and MARSAME Surveys

David Stuenkel, Trinity Engineering Associates

Location: Marina 2

The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) provides guidance on how to demonstrate that a site complies with applicable radiation dose- or risk-based release criteria. In a similar way, the Multi-Agency Radiation Survey and Assessment of Materials and Equipment (MARSAME) manual, a supplement to MARSSIM, provides guidance on how determine proper disposition of materials and equipment. While both MARSSIM and MARSAME and provide comprehensive guidance, the focus of both is one the design and evaluation of final surveys, known as final status surveys in MARSSIM and disposition surveys in MARSAME. This presentation will discuss the evaluation of final status surveys and disposition surveys. This will include preliminary data review; calculations of upper confidence levels, minimum detectable concentrations, and minimum quantifiable concentrations; and the performance of statistical tests. Illustrative examples will be used to demonstrate these concepts.

1-B Harmony in Concepts and Units for Internal Dose Calculations for Nuclear Medicine Applications or for Protection of Radiation Workers

Michael Stabin, PhD, CHP; RADAR, Inc.

Location: Marina 3

Internal dose calculations for nuclear medicine applications or for protection of radiation workers are based on the same fundamental concepts and units. The various systems developed to provide a basis for the needed calculations (e.g. ICRP 30/60/103, MIRD, RADAR) use equations that appear to be different, but are in fact identical when carefully studied. The RADAR method harmonized the defining equations and units employed to provide quantitative analysis for these two general problem areas. This program will show, from a theoretical standpoint, how all of these systems are identical in concept, and will then show, using practical examples, how each is applied to solve different problems. For nuclear medicine, an overview will be given of the current state of the art and promise for future improvements to provide more patient specificity in calculations and better ability to predict biological effects from calculated doses. For occupational applications of internal dosimetry, an overview will be given of currently applicable models and methods for bioassay analysis and dose assessment, showing several practical examples.

1-C Medical Laser Safety Program – What Health Physicists Need to Know

Deidre Elder, University of Colorado Hospital

Location: Spinnaker

Medical laser systems are used in many clinical settings, including ophthalmology and dermatology clinics, interventional radiology and cardiology and the operating room. Whether it is a small clinic or a large academic medical center, a health care facility with laser applications should have a program in place to ensure the safety of patients and personnel. Health Physicists and Medical Physicists may be asked to oversee laser safety programs at medical facilities and need the tools to run an effective program. The 2018 edition of the American National Standard for Safe Use of Lasers in Health Care (ANSI Z136.3-2018) was released in August and will be discussed along with other standards that apply to the use of medical lasers.

Sunday 10:30 AM – 12:30 PM

2-A Alpha Spectroscopy for the HP

Craig Maddigan, ORTEC

Location: Marina 2

This course offers a fast-paced review of the basic principles of alpha spectroscopic analysis for the Health Physicist. The course includes a review of the nature and origins of alpha-particle emitting radioactivity, basic physics of alpha particle interaction with matter, considerations and consequences of sample preparation for alpha spectroscopy, alpha spectroscopy system components and calibrations, and a primer on interpretation of alpha spectroscopy data.

2-B Thorium Molten Salt Reactors (TMSR): Key Radiation Protection Challenges

Casper Sun, Health Physicist

Location: Marina 3

Join this lecture for an overview of thorium molten salt reactors (TMSR) and their radiation safety requirements. In recent years, the potential of TMSR has captivated the attention of our nuclear energy industry. Key benefits include fuel flexibility—the ability to burn spent fuels, thorium, and unwanted plutonium—as well as reduced risk, both during normal reactor operations

and in case of emergency. As Richard Martine noted in MIT Technology Review (2016), "cheaper and cleaner nuclear plants could finally become a reality…the technology was invented more than 50 years ago".

Overall, TMSR is a very promising option for nuclear energy, but there's work to be done. We'll review the top radiation protection considerations around TMSR today, including neutron radiation protection, fuel loading management and chemical separation, and controlling neutron flux in the core. Lastly, you'll get a quick look at things to come: robotic radiation workers operating advanced nuclear reactors.

2-C Full Range Risk Training for Health Physicists

Rick Whitman & Kim Kearfott; Associate Faculty SPEA Homeland Security; Nuclear Engineering and Radiological Sciences, University of Michigan

Location: Spinnaker

Radiation Safety Officers often face many more challenges than just health physics. Because Health Physicists typically work alone, programs providing training need to provide students a full range of risk tools to ensure program success and safety. HPs need to develop the ability to explain complex topics across different populations from researchers to support staff, and even to the public without invoking fear including the psychology of stress management. HPs need the ability to brief both up and down the management chain on how secondary concerns, e.g., legal weaknesses and challenges, environmental requirements, changing licensing or protection requirements, labor union challenges, and other topics could prove problematic and even expensive to the larger organization. As research becomes more complex HPs often need to plan for seemingly mutually exclusive safety requirements involving one or more simultaneous hazards: radioactive material; machine generated radiation; non-ionizing radiation; chemicals; explosives; biologicals or more in addition to human and environmental concerns. This presentation will present both scenarios and recommendations to improve Health Physics training.

Sunday 2:00 PM – 4:00 PM

3-A Gamma Spectroscopy for the Health Physicist

Craig Maddigan, ORTEC

Location: Marina 2

This course offers a fast-paced review of the basic principles of gamma spectroscopic analysis for the Health Physicist. The course includes a review of the nature and origins of gamma emitting radioactivity, basic physics of gamma interaction with matter, consequences of gamma interactions on gamma spectra, gamma spectroscopy system components and calibrations, gamma spectroscopy analysis methods, and interpretation of gamma spectroscopy data.

3-C Technical Basis and Operational Experience for Clearance of Personal Property from SLAC Accelerator Facilities

James Liu, Ryan Ford, Jim Allan, Sayed Rokni; Radiation Protection Department, SLAC National Accelerator Laboratory (SLAC)

Location: Spinnaker

At high energy particle accelerators, induced radioactivity in accelerator components or materials can occur as a direct or indirect consequence to exposure to the particle beam and/or the secondary radiation particles due to beam losses. Management of the potentially activated materials is an important part of the radiation protection program. This presentation addresses the release of the materials from radiological control (i.e., clearance of personal property) in accelerator facilities to meet the DOE Order 458.1 requirements. SLAC, a high-energy electron accelerator facility, has successfully release metals for recycle in the past few years. The SLAC material clearance program with its technical bases are consistent with the DOE Technical Standard DOE-STD-6004-2016 on "Clearance and Release of Personal Property from Accelerator Facilities".

The technical bases that support the clearance of metals (e.g., aluminum, iron, steel, copper, and lead) associated operational experience at SLAC will be presented. The emphasis of the technical basis is placed on the volumetric radioactivity aspects, instead of surface contamination, due to potential activation at high-energy accelerator facilities and the more challenging measurement methods for volumetric radioactivity. The technical basis includes process knowledge (e.g., characteristics of induced radioactivity, proxy radionuclides versus the hard-to-measure radionuclides, and surface maximum activity), measurement protocols (including quantification of detection capability), and a release criterion based on that the release measurements are indistinguishable from background (IFB).

SLAC has developed and implemented a material management and release program for the material clearance and metal recycling. The program includes the establishment of radiation detection instrumentation and measurement methods to meet the ANSI N13.12 screening level requirements for clearance of accelerator materials. These instruments include portable instruments with sufficient detection capability for survey on material surfaces, field gamma spectrometer for confirmatory measurements, and a portal gate monitor. The discussion will also include best practices for instrument set-up, field measurements, documentation and record management, and communication with stakeholders. A summary of recycling progress, as well as lessons learned and mitigation of safety hazards, at SLAC will be provided.

CONTINUING EDUCATION LECTURES

CELs take place in the Sheraton San Diego Hotel & Marina

Monday 7:15 AM – 8:15 AM

CEL-1 The Case Against LNT

Alan Fellman, CHP; NV5

Location: Spinnaker

Radiation safety programs must establish compliance with radiation regulations which continue to be based on the linear no-threshold (LNT) hypothesis and the ALARA principle, despite overwhelming sound, peer-reviewed science that demonstrates the existence of a carcinogenic threshold and/or hormesis at low doses. LNT and ALARA insist that when we make changes that lower worker dose by as little as one µSv, we are making the workplace safer. Public health authorities and many radiation safety professionals have convinced most members of the public that when we evacuate 150,000 persons following Fukushima to keep them from receiving tens of mSv, we are improving public health despite the fact that this decision has resulted in more than 1,600 fatalities among evacuees. Yet despite compelling evidence revealing LNT to be fraudulent, the consistent response taken by regulatory agencies and scientific bodies whose recommendations are cited as the basis of regulatory actions is to deflect or rationalize away the science at best or simply pretend it doesn't exist at worst so as to maintain allegiance to a worldview of radiation safety built on ALARA and LNT. A sample of relevant findings supporting this allegation will be presented.

Monday 7:15 AM – 8:15 AM

CEL-2 Dosimetry Challenges of New Nuclear Medicine Theranostic Agents

Michael Stabin, PhD, CHP; RADAR, Inc.

Location: Marina 3

The term theranostics is defined as the integration of a diagnostic test with a specific therapeutic intervention. The diagnostic test should identify patients who will likely respond to a particular therapy, fail to respond to a given drug or eventually exhibit adverse events. The therapeutic application seeks to treat a specific disease. This session will describe the criteria for selecting good theranostic radiopharmaceuticals, and provide an overview of several useful theranostic agents in use, or under consideration for use, in nuclear medicine therapy, with a focus on the radiation dosimetry aspects.

To download a CEL talk, use this link and type in the corresponding CEL Code:

http://burkinc.net/HPS2019MYPEP.php

CEL1 – 1854	CEL3 – 8816
CEL2 – 4350	CEL4 – 9865

Tuesday 7:15 AM – 8:15 AM

CEL-3 Fundamentals of Environmental Health Physics

Jeffrey J. Whicker, PhD

Location: Harbor Island 3

Environmental health physics is a multi-disciplinary application of radiation protection to the public and the environment from exposures to radioactive materials released or present in the surrounding environment. It requires study of the transport, fate and effects of radioactive materials in the environment, and knowledge of how human and non-human receptors interact with the environment. The origins of environmental health physics can largely be traced to above-ground nuclear testing and the recognition that regulations were needed for public safety. Today, all key regulatory agencies (e.g., EPA, NRC, DOE) have requirements related to radiation protection of the public. Key elements for public radiation protection include 1) dose limits (public and non-human biota), 2) requirements for facility emission controls (e.g., filters, waste treatments, etc.), 3) measurements (effluent and environmental surveillance) to measure emissions and effectiveness of engineered controls, 4) requirements for radioactive wastes, 5) release limits for property leaving sites with radiological operations, 6) emergency preparedness for accidental releases, and 7) knowledge of radiation risk imposed in the context of that inherent from naturally occurring radioactive materials. In this course, we will discuss the fundamental aspects of the practice of environmental health physics including a regulatory overview, development of goals for property release (how clean is clean?), important aspects of environmental sampling programs, and general methods to calculate radiation doses to identified receptors.

Tuesday 7:15 AM – 8:15 AM

CEL-4 Personnel Contamination Monitoring the 411

Shawn W. Googins MS, CHP; Technical Services Manager, Radiation Safety & Control Services Inc.

Location: Spinnaker

This CEL will cover the basics of personnel contamination monitoring from simple frisking with GM pancake probes to sophisticated hand-foot-cuff monitors and whole body personnel contamination monitors. Learn some of methods and equipment used, the capabilities, and limitations of the equipment. Refresh your understanding of the equipment's MDAs for passive internal monitoring and more!. Practical examples and information will be presented.

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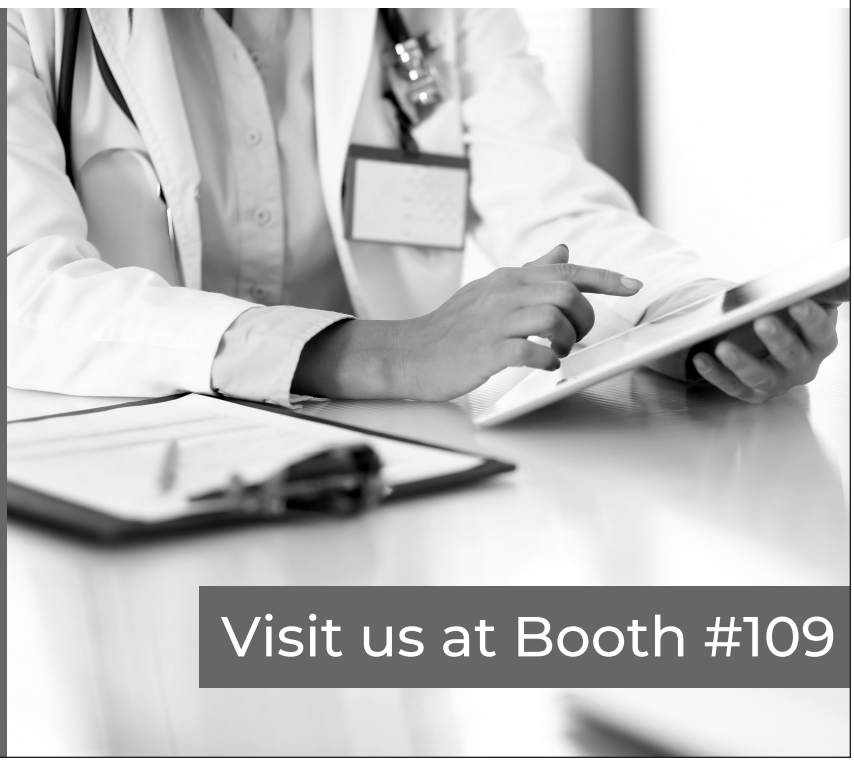

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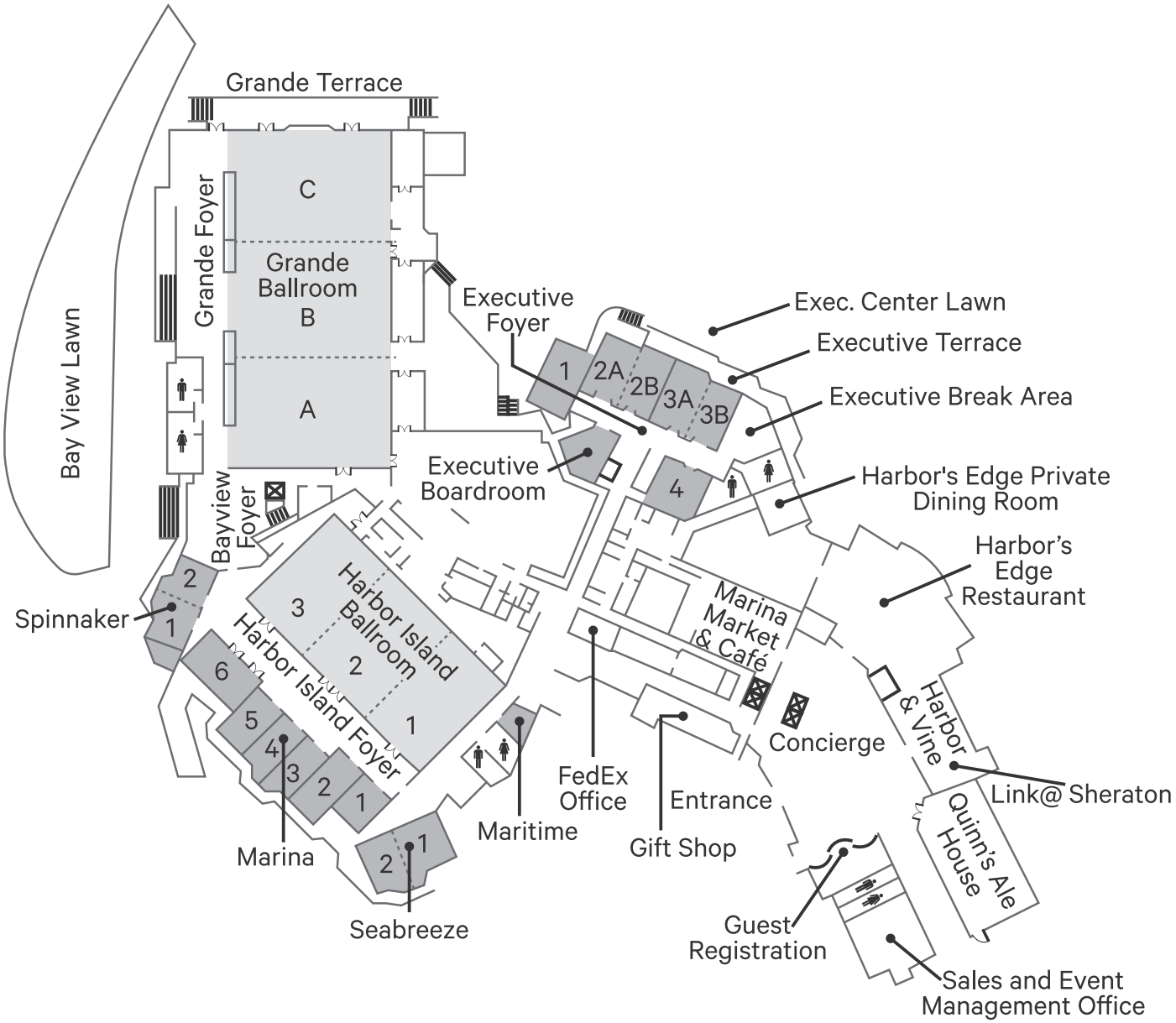

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- Geometry Reference Sources – Marinelli Beaker, Charcoal Cartridges, Filter etc.
- Customized Sources for all applications
- Quarterly Inter-Laboratory Hot and Environmental Cross Check Program
- Mixed Fission Product Materials and Standards

NEW

- Ra-228 Standardized Solution
- Xe-127 available again as Pressurized and Unpressurized Gas Standards
- Automess Teletector 6112AD
- Beta Secondary Standard 2 Upgrade
- Marinelli Beaker with Tight Sealing, Innovative Screw-On and Traditional Snap-On Lids

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