FINAL PROGRAM

Health Physics Society 50th Midyear Meeting

22-25 January 2017 · Bethesda, Maryland

Bethesda North Marriott Hotel

AAHP

USA CAN NRRPT

ABHP

50th Midyear Meeting

Health Physics Society

Bethesda North Marriott Hotel · 22-25 January 2017 · Bethesda, Maryland

The 2017 Midyear Meeting
is presented by the
Health Physics Society

Thank you to our Sponsor:
Dan Caulk Memorial Fund

Table of Contents

Committee Meetings 2
Exhibitors 3
Technical Program 8
AAHP Courses 20
PEP Programs 21
CEL Programs 24
Author Index 26
Hotel Floor Plans 28

Registration Hours

Grand Ballroom Foyer

Sunday 22 January
3:30 PM-5:30 PM

Monday 23 January
7:30 AM-3:30 PM

Tuesday 24 January
8:00 AM-3:00 PM

Wednesday 25 January
8:00 AM-11:30 AM

Exhibit Hours

Grand Ballroom D-H

Monday

Noon-6:30 PM . . . . . Exhibits Open
Noon-1:00 PM . . . . . Complimentary Lunch
3:00 PM-3:30 PM . . . . . Coffee Break
5:00 PM-6:30 PM. . . . . .Exhibitor Reception/ Poster Reception

Tuesday

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

HPS COMMITTEE MEETINGS

All Committee Meetings are in the Bethesda North Marriott Hotel

Saturday 21 January 2017

Executive Committee Meeting and Lunch
12:00 pm – 5:00 pm — Linden Oak

Sunday 22 January 2017

HPS Board Meeting
8:00 am – 5:00 pm — Linden Oak

AAHP Executive Committee
8:00 am – 5:00 pm — Brookside A

Monday 23 January 2017

Companion Orientation
9:00 am – 10:00 am — Oakley

SPIC Meeting
12:30 pm – 1:30 pm — Oakley

Finance Committee Meeting
2:00 pm – 5:00 pm — Forest Glen

Professional Development School Committee
4:00 pm – 5:00 pm — Oakley

Tuesday 24 January 2017

NCRP PAC-2
1:00 pm – 3:00 pm — Oakley

ANSI 42.17A and B
1:00 pm – 3:00 pm — Strathmore Hall

Sunday, January 22
6:00 pm-7:00 pm

Welcome Reception
White Oak AB, lower level

Plan on stopping in for the HPS Welcome Reception. There will be an opportunity to meet friends and to start your evening in Bethesda.

Speaker Ready Room

Middlebrook

Sunday	2:00 PM – 5:00 PM
Monday	7:00 AM – 5:00 PM
Tuesday	7:00 AM – 5:00 PM
Wednesday	7:00 AM – 10:30 AM

Tuesday, January 24
1:00 pm-5:00 pm

NNSA Demonstration of Radiological Emergency Response Assets

DOE's National Nuclear Security Administration will host a static demonstration of its radiological emergency response assets available within the National Capital Region and regionally throughout the United States. These include aircraft-mounted radiation detection systems as well as various handheld and mobile radiation detection systems. Assets from a National Guard Bureau Weapons of Mass Destruction Civil Support Team will also be on display.

Preregistration only, and only open to US Citizens. You must bring valid government ID in order to attend.

2017 HPS MIDYEAR MEETING EXHIBITORS

Exhibits are located in the Bethesda North Marriott Hotel, Grand Ballroom D-H

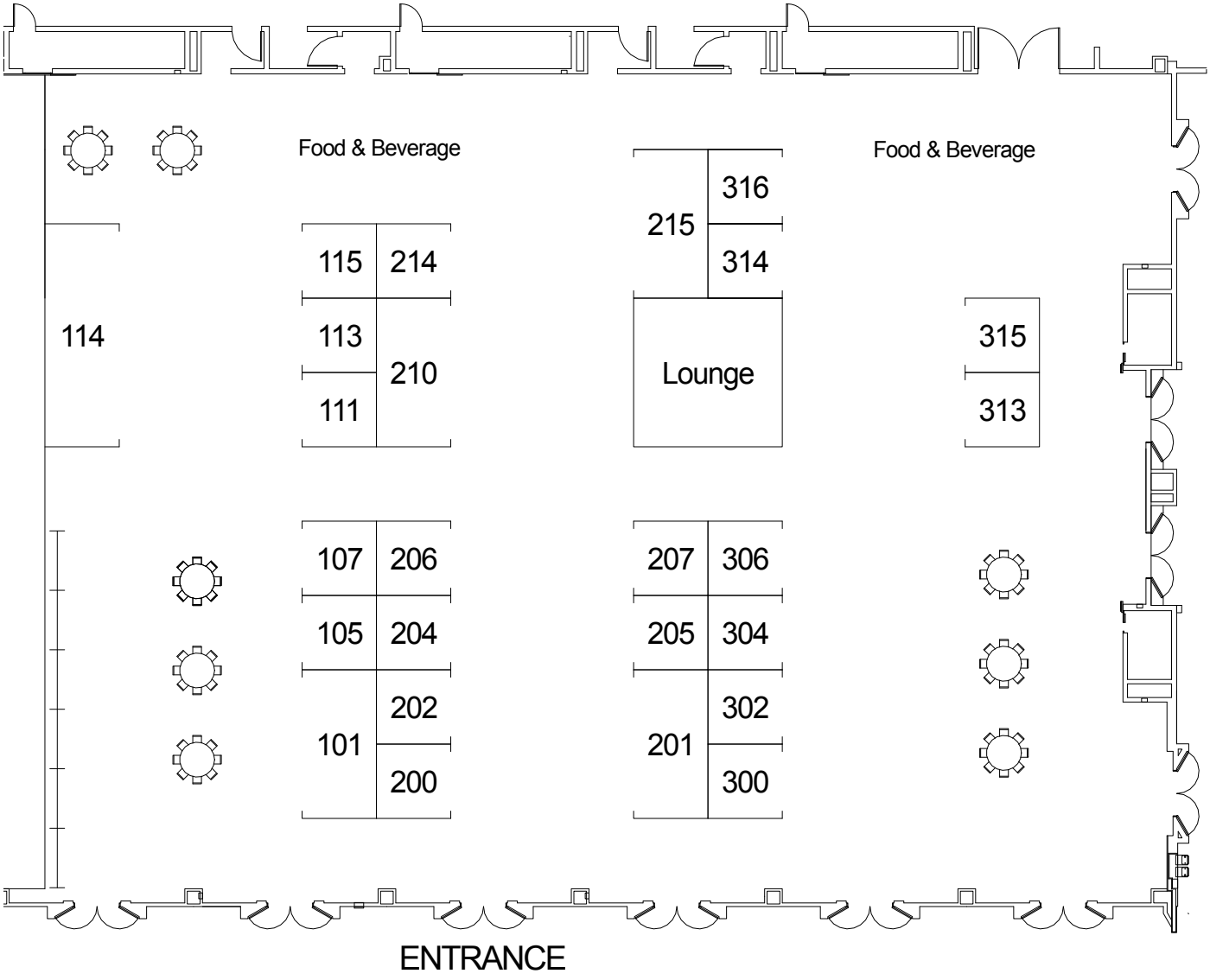
Exhibit Hours

Monday

Noon – 6:30 PM . . . . . Exhibits Open
Noon – 1:00 PM . . . . . Complimentary Lunch
3:00 PM – 3:30 PM . . . . . Coffee Break
5:00 PM – 6:30 PM . . . . . Exhibitor Reception/ Poster Reception

Tuesday

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



2017 HPS MIDYEAR MEETING EXHIBITORS

Exhibits are located in the Bethesda North Marriott Hotel, Grand Ballroom D-H

2017 Annual Meeting Raleigh, NC — Booth: 202

www.hps.org/meetings

Bertin Instruments — Booth: 302

2096 Gaither Road, Suite 230
Rockville, MD 20850
301-339-8103; Fax: 301-563-9426
www.bertin-instruments.com

Based on Saphymo's strong expertise, Bertin Instruments has developed and optimized Nuclear equipment to provide state-of-the-art instrumentation for the customer. Its products are associated with personal protection as well as process and environmental monitoring: Dosimetry systems, Contamination monitors, Environmental radiation monitoring systems, Survey meters and Access control.

Best Dosimetry — Booth: 306

865 Easthagan Drive
Nashville, TN 37217
866-492-8058
www.bestdosimetry.com

Best Dosimetry Services (BDS) provides an economically priced radiation badge service for monitoring and tracking the radiation dose received by workers who are occupationally exposed to ionizing radiation. We serve a variety of customers including dental practices, veterinary practices, hospitals, and other organizations that utilize x-ray machines.

Bionomics — Booth: 200

PO Box 817
Kingston, TN 37763
865-220-8501; Fax: 865-220-8532
www.bionomics-inc.com

Bionomics continues to be the leading service provider to generators of low level and mixed waste across the country. With a commitment to supporting their clients and the use of only the top tier processing and disposal facilities, Bionomics remains the top broker. Bionomics has been the leading voice for small waste generators during the development of regulations and polices surrounding the new burial site in Texas. We are the first company other than WCS to be approved to ship into the Andrews facility and are currently accepting sources for disposal at this facility. In addition to waste disposal services we provide assistance in other related fields including surveys and site closures.

Dade Moeller — Booth: 215

1835 Terminal Drive, Suite 200
Richland, WA 99354
509-946-0410; Fax: 703-790-2672
www.dademoeller.com

Dade Moeller, An NV5 Company (www.dademoeller.com) is a nationally-recognized consulting firm specializing in radiological safety, public & environmental health protection, occupational safety & health, NORM/TENORM and training. We provide this full range of professional and technician services to government and commercial nuclear clients.

Eckert & Ziegler — Booth: 210

1380 Seaboard Industrial Blvd
Atlanta, GA 30318
404-352-8677; Fax: 404-352-2837
www.ezag.com

Eckert & Ziegler Isotope Products provides high quality, NIST traceable radioactive calibration sources, solutions and gases. We operate 3 ISO17025: 2005 DAkkS accredited calibration laboratories, 2 in the USA and one in Germany. Radiochemical performance evaluation samples are provided quarterly for effluent and environmental monitoring programs.

Ecology Services — Booth: 105

9135 Guilford Road Suite 200
Columbia, MD 21046
800-963-8999
www.ecologyservices.com

Ecology Services, Inc. is a national company providing radioactive and mixed waste management/disposal and health physics services. Since 1989 ESI has serviced pharmaceutical, educational, biotech, medical and research facilities.

Fluke Biomedical/RaySafe — Booth: 204

6045 Cochran Road
Cleveland, OH 44139
440-542-3650
www.flukebiomedical.com

Gamma Products, Inc. — Booth: 214

7730 W. 114th Place
Palos Hills, IL 60465
708-974-4100; Fax: 708-974-0071
www.gammaproducts.com

Gamma Products, Inc. has been designing and manufacturing scientific instruments for over 50 years. We specialize in low background α/β automatic & manual proportional counting systems, gas free automatic α/β counting systems, Ra226/228 & gamma automatic sample changers, and lead or steel counting and storage shields.

HI-Q Environmental Products Co., Inc. — Booth: 300

7386 Trade Street
San Diego, CA 92121
858-549-2820; Fax: 858-549-9657
www.HI-Q.net

HI-Q Environmental Products Company is an ISO 9001:2008 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 and 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.

Hopewell — Booth: 205

5940 Gateway Drive
Alpharetta, GA 30004
770-667-5770
www.hopewelldesigns.com

Hopewell Designs, Inc. provides automated and manual irradiator systems and radiation shielding for government laboratories, nuclear power plants, private industry, medical laboratories and universities in the Americas and throughout the world. We began operations in 1994 by designing and manufacturing the first fully automated calibration laboratory for the Department of Energy at the Savannah River Site. Today we are the primary provider of automated irradiator systems for calibrating radiation survey meters. Our expertise and experience in radiation and shielding design, software development, systems integration, manufacturing, training, and complex project management enables us to deliver quality products and service for hundreds of clients.

HPS Journal — Booth: 101

www.hps.org

J.L. Shepherd & Associates — Booth: 304

1010 Arroyo Street
San Fernando, CA 91340
818-898-2361
www.jlshepherd.com

JLS&A's products include Cesium-137 and Cobalt-60 sources, biological research, blood component, space effects testing, sterilization and process irradiators. Gammacell 220 Cobalt-60 Reloads and Uploads. Gamma, beta and neutron instrument calibration and dosimeter irradiation facilities. Irradiator/Calibrator security upgrades, service, repair, relocation and decommissioning for current and extinct manufacturers. Hot cell windows and lead glass.

LabLogic Systems, Inc. Booth: 316

1040 East Brandon Blvd
Brandon, FL 33511-5509
813-626-6848; Fax: 813-620-3708
www.lablogic.com

LabLogic specializes in instrumentation and software dedicated to the measurement and analysis of radioisotopes used in environmental, pharmaceutical, nuclear medicine and research laboratories. Our products include liquid scintillation counters, radiation monitors, personal dosimeters, radio-chromatography instruments and software, microplate readers and a variety of radiation safety consumables.

LANDAUER, Inc. Booth: 206

2 Science Road
Glenwood, IL 60425
800-323-8830
www.landauer.com

The industry leader for more than 60 years, Landauer provides integrated radiation safety solutions, including dosimetry technology to measure radiation exposure; informatics to track and analyze radiation data; and health and medical physics consulting expertise. Landauer uniquely provides solutions to improve worker and patient safety, ensure compliance and lower costs.

LAURUS Systems Booth: 107

3460 Ellicott Center Drive, Suite 101
Ellicott City, MD 21043
410-465-5558
www.laurussystems.com

LAURUS Systems is a private, woman-owned small business providing sales and service of high quality radiation detection instruments and systems. We offer a range of services that include instrument maintenance, calibration and training. Our expansive customer base in the U.S. and abroad includes federal, state and local agencies, military installations, national labs, hospitals and commercial entities.

LND Inc. Booth: 111

3230 Lawson Blvd.
Oceanside, NY 11572
www.lndinc.com

Designers and manufacturers of nuclear radiation detectors. Products include GM tubes, x-ray proportional counters, He-3 and BF-3 proportional counters, ionization chambers, polymer window detectors, and custom detectors.

Ludlum Measurements, Inc. Booth: 201

501 Oak Street
Sweetwater, TX 79556
800-622-0828; Fax: 325-235-4672
www.ludlums.com

Ludlum Measurements, Inc. (LMI) has been designing, manufacturing and supplying radiation detection and measurement equipment since 1962 in response to the worlds' need for greater safety. LMI has developed radiation detection technologies and instruments supporting enhanced security of both personnel and the environment, and matched them with superior customer service.

Mirion Technologies Booth: 114

800 Research Parkway
Meriden, CT 06450
800-243-4422
www.mirion.com

Mirion Technologies is a leading provider of innovative products, systems and services related to the measurement, detection and monitoring of radiation. The company delivers high quality, state of the art solutions that constantly evolve to meet the changing needs of its customers. With the addition of the Canberra brand in 2016, Mirion expanded its portfolio and the breadth of its expertise to bring a new standard of solutions to the market. Every member of the Mirion team is focused on enhancing the customer experience by delivering superior products, exceptional service and unsurpassed support. Mirion Technologies: Radiation Safety. Amplified.

ORTEC Booth: 207

801 South Illinois Avenue
Oak Ridge, TN 37830
865-482-4411; Fax: 865-483-0396
www.ortec-online.com

ORTEC is an industry leader in the design and manufacture of ionizing radiation detectors, nuclear instrumentation, analysis software, and integrated systems. Our technologies, products, and services are instrumental in materials analysis for radioisotopic content. Visit our booth to experience the most accurate handheld radionuclide identifiers available and learn more about ORTEC products.

Radiation Safety & Control Services, Inc. — Booth: 113

91 Portsmouth Avenue
Stratham, NH 03885
603-778-2871
www.radsafety.com

Established in 1989, RSCS, Inc. is a small business that offers expertise in all aspects of radiation safety and measurement applications. Our company specializes in operational and decommissioning services for nuclear power plants as well as for industrial, medical, and government radiological facilities. Our core services include health physics consulting, training, software, instrumentation (including design, installation, calibration, and repair), emergency planning, and specialized radiological characterizations and measurements. RSCS also represents several lines of radiation detection equipment and offers our own radiation training simulator devices.

Radiation Solutions — Booth: 315

5875 Whittle Road
Mississauga, Ontario L4Z 2H4
Canada
905-890-1111
www.radiationsolutions.com

Radiation Solutions Inc. (RSI) is a manufacturer of low level radiation detection instruments. Products include handheld nuclide identification (RIID) units, mobile systems for land vehicle, marine, airborne and stationary monitoring. Applications range from environmental, emergency response, security and geological mapping. The various systems offer Survey / Search, Nuclide ID, Mapping and Directional capabilities. In addition, vehicle portal monitoring systems are also produced for homeland security, the scrap metal recycling industry and for solid waste transfer stations and trash sites.

S.E. International, Inc. — Booth: 314

PO Box 39, 436 Farm Road
Summertown, TN 38483
800-293-5759; Fax: 931-964-3564
www.seintl.com

S.E. International, Inc. is the manufacturer of the Radiation Alert® product line offering handheld ionizing radiation detection instruments for surface and air contamination. Proven to be reliable in the environmental, laboratory, research, health physics, educational fields and HAZMAT. Come by and see our Area Monitor and Frisker. We have new instruments! See the RANGER and MONITOR 200!

Ultra Electronics Nuclear Control Systems — Booth: 313

Lancaster Road, Ferndown Industrial Estate
Wimborne, Dorset, BH21 7SQ, UK
44 (0)1202 850450; Fax: 44 (0)1202 850451
www.ultra-ncs.com

Ultra Electronics Nuclear Control Systems specialise in the supply of radiation detection systems to the nuclear industry. Product supplied include measurement instruments for the measurement of radioactive concentration in air and liquids. Ultra Electronics Nuclear Control Systems support operating NPP's, fuel cycle facilities and decommissioning projects in the USA.

Versant Medial Physics and Radiation Safety — Booth: 115

116 S. Riverview Drive
Kalamazoo, MI 49004
888-316-3644; Fax: 888-589-6354
www.versantphysics.com

Versant Medical Physics and Radiation Safety is a health service support company, focusing on medical physics, radiation safety, and commissioning through expert consultation and training. Our core values are integrity, empowerment, and diligence. We are a woman-owned small business providing services throughout the US.

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 Bethesda North Marriott Hotel

MONDAY

7:00 AM – 8:00 AM — Grand Ballroom A

CEL-1
Meeting the National Need: An Overview of the DOE Isotope Program
Balkin E

7:00 AM – 8:00 AM — White Flint Ampitheatre

CEL-2
Recent Topics in the Field of Low Dose Radiation Biology
Metting N

8:30 AM – 12:00 PM — Grand Ballroom BC

MAM-A
Plenary Program
HPS in Washington: A Discussion with Key Stakeholders in Health Physics
Chair: Robert Cherry

8:30 AM **INTRODUCTION**
Cherry R

8:40 AM **MAM-A.1**
Follow the Yellow Brick Road – Radiation Protection and Nuclear Power
Cool DA
EPRI

9:00 AM **MAM-A.2**
Your NCRP: Current and Future Activities
Held K, Boice J
NCRP

9:30 AM **MAM-A.3**
Commercial Nuclear Power – State of the Industry
Schlueter J
Nuclear Energy Institute (NEI)

10:00 AM **COFFEE BREAK**
Ballroom Foyer

11:30 AM **MAM-A.4**
NRC's Re-Evaluation of Category 3 Source Security and Accountability Initiatives
White AD
U.S. Nuclear Regulatory Commission

11:00 AM **MAM-A.5**
GAO Report on NRC's Radiological Materials Licensing Program
Woodward N
US Government Accountability Office

11:30 AM **PANEL DISCUSSION**

12:00 PM **LUNCH**
Grand Ballroom D-H

1:30 PM – 5:00 PM — Grand Ballroom BC

MPM-A
NCRP Special Session: Nuclear Power and Radiation Protection
Co-chairs: Jerry Hiatt, Kathy Held

1:30 PM **MPM-A.1**
The U.S Environmental Protection Agency's Uranium Fuel Cycle Regulatory Actions
Peake T
US Environmental Protection Agency

1:55 PM **MPM-A.2**
NCRP CC-1 – Recommendations on Radiation Protection for the United States
Cool DA
EPRI

2:20 PM **MPM-A.3**
RP Implementation of the Prospective Assessment
Harris W
Exelon Nuclear

2:45 PM **PANEL DISCUSSION**

3:00 PM **COFFEE BREAK**
Grand Ballroom D-H

3:30 PM **MPM-A.4**
Implications of Recent Epidemiologic Studies for the LNT Model
Shore R
Radiation Effects Research Foundation (Retired)

3:55 PM **MPM-A.5**
Evaluating Cardiovascular Effects
Dauer L
Memorial Sloan Kettering Cancer Center

4:20 PM **MPM-A.6**
The One-Million Persons Study of Low-Dose Radiation Effects (MPS): Dosimetry Aspects
Bouville AC
NCRP

4:45 PM **PANEL DISCUSSION**

1:00 PM – 4:30 PM **Grand Ballroom A**

MPM-B
Risk Analysis
Chair: Ray Johnson

1:00 PM **MPM-B.1**
Superposition Analysis of Normalized Gaussians
Hayes R
North Carolina State University

1:15 PM **MPM-B.2**
How Decisions for Radiation Safety are Governed by Habit
Johnson RH
Radiation Safety Counseling Institute

1:30 PM **MPM-B.3**
US EPA Superfund Radon Vapor Intrusion Preliminary Remediation Goal (RAD-VIPRG) Electronic Calculator
Dolislager FG, Walker SH, Bellamy MA, Galloway LD
The University of Tennessee, US Environmental Agency, Oak Ridge National Laboratory

1:45 PM **MPM-B.4**
U.S. EPA Superfund Counts Per Minute (CPM) Electronic Calculator
Dolislager FG, Walker SH, Bellamy MA, Bolus K
The University of Tennessee, US Environmental Agency, Oak Ridge National Laboratory

2:00 PM **MPM-B.5**
Why Telling the Truth About Radiation May Not Work
Johnson RH
Radiation Safety Counseling Institute

2:15 PM **MPM-B.6**
Acute Radiation Dermatitis
Kindrick S, Camphausen K, Ribaudo C
NIH

2:30 PM **MPM-B.7**
Risks from Radon in Homes and Costs for its Control
Pawel DJ, Krop R
U.S. Environmental Protection Agency, The Cadmus Group

2:45 PM **MPM-B.8**
Comparing Radiological Risk and Dose Assessment Models of International and National Agencies
Shubayr N, Walker S
U.S. Environmental Protection Agency (EPA)

3:00 PM **COFFEE BREAK**
Grand Ballroom D-H

3:30 PM **MPM-B.9**
Superfund Evolving Adjustments to External Slope Factors for Risk Assessments
Walker SA, Dolislager FG
U.S. Environmental Protection Agency, University of Tennessee, Oak Ridge National Laboratory

3:45 PM **MPM-B.10**
Superfund Update: Revisions to Risk and Dose Assessment Tools
Walker SA, Dolislager FG
U.S. Environmental Protection Agency, University of Tennessee

4:00 PM **MPM-B.11**
Assessment of Radium-226 Level on Some Water Samples Collected at Giri and Kuje Area of Abuja, North Central Nigeria
Maxwell O, Wagiran H, Saeed A, Sunday JE, Adewoyin O
Covenant University, Universiti Teknologi Malaysia

4:15 PM **MPM-B.12**
Assessment of Natural Radioactivity Levels in the Coal Formation, Enugu, South Eastern Nigeria
Maxwell O, Saeed A, Sunday JE, Adewoyin O, Embong Z
Covenant University, Universiti Teknologi Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM)

CEL Courses (Included in registration fee)
To download a CEL talk, use this link and type in the corresponding CEL Code:

http://burkinc.net/HPS2017MYPEP.php

CEL1-8816
CEL2-9865
CEL3-1427
CEL4-2057
CEL5-2411
CEL6-8743

5:00 pm - 6:30 pm **Grand Ballroom D-H**

Exhibitor Reception

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

5:00 pm - 6:30 pm **Grand Ballroom D-H**

Poster Session

P.1 Ships and Submarines — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.2 Pitchblende — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.3 Physicians and Radiologists, and Other Contributors to the Health Sciences — A Philatelic Look at Health Physics History
Johnston Thomas P
NIST

P.4 An Assessment of the Potential Association Between in Utero Exposure to Ionizing Medical Radiation and Childhood Leukemia: A Meta-Analysis of Literature, 2001-2015
Ioannidou SP, Smith DA
Georgetown University

P.5 Space Radiation Exposure Simulation During Different Phases of Solar Activity
*Paschalis P, Tezari A, Gerontidou M, Mavromichalaki H, Ioannidou SP**
National and Kapodistrian University of Athens, Georgetown University

P.6 Impact of Space Weather on Human Heart Rate During Solar Cycle 24
Ioannidou SP, Galata E, Mavromichalaki H, Gerontidou M, Ntakos G, Paravolidakis K, Benevides L
Georgetown University, National and Kapodistrian University of Athens, Nikaia General Hospital

TUESDAY

6:45 AM – 7:45 AM **Grand Ballroom A**

CEL-3
Dose Coefficients: What Are They, Where Do They Come From, and How Do We Use Them?
Dewji S
Center for Radiation Protection Knowledge, ORNL

6:45 AM – 7:45 AM **White Flint Ampitheatre**

CEL-4
Radioecology 1 – Introduction to Radioecology and Environmental Protection Programs
Condon CA

8:00 AM – 9:15 AM **Grand Ballroom A**

TAM-A1
Emergency Planning/Homeland Security
Chair: Jama VanHorne-Sealy

8:00 AM **TAM-A1.1**
Experiences Developing a Radiation Response Volunteer Medical Reserve Corps Unit
Elder D
University of Colorado Hospital

8:15 AM **TAM-A1.2**
The Use of Radioactive Sources for Local Law Enforcement Agency Training
Rubin WM
National Institutes of Health

8:30 AM **TAM-A1.3**
An Overview of the Health and Safety Planning Guide for Planners, Safety Officers and Supervisors for Protecting Responders Following a Nuclear Detonation
Scott AL, VanHorne-Sealy JD
DHS, OHA, DOD

8:45 AM **TAM-A1.4**
Permanently Reducing Risk Through Cesium-137 Irradiator Replacement
Garrison LM
National Nuclear Security Administration

9:00 AM **TAM-A1.5**
Communicating Between the Lines: The Need to Effectively Communicating Between Regulatory Limits and Emergency Threshold Model Guidance
VanHorne-Sealy JD
US Army Nuclear and Countering WMD Agency

9:30 AM – 11:45 AM **Grand Ballroom A**

TAM-A2
Special Session: Government Relations
Chair: Craig Little

9:30 AM **TAM-A2.1**
The HPS Government Relations Program and Why It's Good for Society Members
Little CA
HPS Federal Agency Liaison

9:45 AM **TAM-A2.2**
NRC/HPS: A Relationship that Informs Radiation Protection
Flannery C
U.S. NRC

10:00 AM **COFFEE BREAK**
Grand Ballroom D-H

10:30 AM **TAM-A2.3**
HPS Interaction with Congress
Connolly DA
HPS

10:45 AM **TAM-A2.4**
Congressional Perspective on Budget and Science Priorities in the 115th Congress and New Administration
Cogliani L
Lewis Burke Associates

11:15 AM **TAM-A2.5**
The HPS as a Welcome Stakeholder in EPA's Radiation Protection Program
Nesky AB, Boyd MA
U.S. EPA

11:30 AM **PANEL DISCUSSION**

12:00 PM **LUNCH**
Grand Ballroom D-H

10:00 AM – 12:00 PM **Brookside B**

TAM-B
Operational Health Physics
Co-chairs: Ray Johnson, Spencer Mickum

10:00 AM **TAM-B.1**
Parametric Study on the Irradiation Field of a High Dose Rate Research Irradiator Design Baseline
Mickum S, Rushton R, Hope Z
Hopewell Designs

10:15 AM **TAM-B.2**
Engineering Heat Rejection in an Extreme Gamma Environment
Olszewska-Wasiolek MA, Prevost D, Hanson DJ
Sandia National Laboratories

10:30 AM **TAM-B.3**
Unique Shielding Considerations for a Newly Installed Hot Cell at the National Institutes of Health
Guarino SN
National Institutes of Health

10:45 AM **TAM-B.4**
Radiological Toolbox 3.0.0
Dewji S, Hiller M, Hertel N, Eckerman K*
Oak Ridge National Laboratory, Georgia Institute of Technology, Easterly Scientific

11:00 AM **TAM-B.5**
How to Communicate Radiation Risks by Asking Questions
Johnson RH
Radiation Safety Counseling Institute

11:15 AM **TAM-B.6**
Can We Change Our Habits to Improve Radiation Risk Communications?
Johnson RH
Radiation Safety Counseling Institute

11:30 AM **TAM-B.7**
Conducting Radiological Surveys Using the Division of Radiation Safety Electronic Survey System
Voegtli VL
National Institutes of Health

11:45 AM **TAM-B.8**
Enhanced Radiation Protection Measures Against Severe Accidents Based on Lessons Learned from the Fukushima Accident
Jeon IY
Korea Institute of Nuclear Safety

12:00 PM **LUNCH**
Grand Ballroom D-H

8:00 AM – 12:00 PM **White Flint Ampitheatre**

TAM-C
Special Session: Medical Health Physics
Co-chairs: Cari Borrás, Linda Kroger

8:00 AM **TAM-C.1**
Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards
Borras C
Consultant

8:30 AM **TAM-C.2**
Why Is Epidemiology an Important Component of Radiation Protection Standards?
Shore RE
Formerly, Radiation Effects Research Foundation and New York University School of Medicine

9:00 AM **TAM-C.3**
NRC Patient Safety Culture
Howe D
USNRC

9:30 AM **TAM-C.4**
How Have Federal Agencies Used Federal Guidance Report No. 14 to Enhance Their Medical X-ray Programs in Medicine, Dentistry, and Veterinary Practice
Keith S, Boyd M, Leidholdt E, Bower M
CDC, EPA, VA, ARMY

10:00 AM **COFFEE BREAK**
Grand Ballroom D-H

10:30 AM **TAM-C.5**
Organ Doses from Diagnostic Medical Radiography — Trends over Eight Decades (1930 to 2010)
Melo DR, Miller DL, Chang L, Moroz B, Linet MS, Simon SL
Melohill Technology LLC, Food and Drug Administration, National Cancer Institute - NIH

11:00 AM **TAM-C.6**
Tracking and Estimating Organ Doses in Radionuclide Imaging
Thomas J
Via Christi Health

11:30 AM **TAM-C.7**
FDA Efforts to Improve the Safety of Radiological Medical Imaging Devices and Radiation Emitting Electronic Products
Ochs RA
FDA/CDRH

12:00 PM **LUNCH**
Grand Ballroom D-H

8:30 AM – 12:00 PM **Grand Ballroom BC**

TAM-D
NCRP Special Session: Nuclear Power and Radiation Protection

Co-chairs: Don Cool, Larry Dauer, Michael Corradini

8:30 AM **TAM-D.1**
Electric Power Research Institute Research Related to Radiological Environmental Protection at Nuclear Power Plants
Kim K
Electric Power Research Institute

8:45 AM **TAM-D.2**
Lens of the Eye Dose Considerations for Nuclear Power Plants
Quinn D
DAQ, Inc.

9:00 AM **TAM-D.3**
Overview of Connecticut Yankee Decommissioning
Tarzia J
Radiation Safety and Control Services, Inc.

9:15 AM **TAM-D.4**
Preparing for the SAFSTOR Method of Decommissioning at the Kewaunee Power Station
Shannon DJ
Dominion

9:30 AM **PANEL DISCUSSION**

9:45 AM **COFFEE BREAK**
Grand Ballroom D-H

10:15 AM **TAM-D.5**
What is KT and R? Evolution of People Programs and Policies
Benevides E
NEI

10:35 AM **TAM-D.6**
Communicating Radiation Protection Issues with the Public
Mayer D
Consultant

11:00 AM **TAM-D.7**
Delivering the Nuclear Promise: Advancing Safety, Reliability, Economic Performance and Radiation Protection Efficiencies
Anderson E
NEI

11:25 AM **PANEL DISCUSSION**

11:50 AM **SUMMARY**

12:00 PM **LUNCH**
Grand Ballroom D-H

1:30 PM – 3:15 PM **Grand Ballroom BC**

TPM-A1
External/Internal Dosimetry and Bioassay

Co-chairs: Shaheen Dewji, Ricardo Reyes

1:30 PM **TPM-A1.1**
Room Submersion Calculations of Noble Gas Dose Rate Coefficients
Veinot K, Dewji S, Hiller M, Eckerman K, Easterly C, Hertel N*
Y-12 National Security Complex, Oak Ridge National Laboratory, Easterly Scientific, Georgia Institute of Technology

1:45 PM **TPM-A1.2**
DoD Biodosimetry Network: Gap Identified and Justification for Proposed Network
Reyes RA
DHS

2:00 PM **TPM-A1.3**
Comparison of Organ Doses for PIMAL Stylized Phantoms in Upright and Bent Positions for Various Irradiation Geometries
Reed L, Dewji S, Hiller M*
Georgia Institute of Technology, Oak Ridge National Laboratory

2:15 PM **TPM-A1.4**
Declared Breastfeeding Worker Program
Fisher TE
National Institutes of Health

2:30 PM **TPM-A1.5**
Methodology to Compare the Relative Protection of Total Body and Effective Dose Limits
Littleton B, Marschke S
US Environmental Protection Agency, S. Cohen & Associates

2:45 PM **TPM-A1.6**
A 3D-Printing Method for the On-Demand Fabrication of Patient-Specific Anthropomorphic Phantoms with Multiple Tissues Represented
Mille MM, Kuzmin G, Zimmerman BE, Lee C
National Institutes of Health, National Institute of Standards and Technology

3:00 PM **TPM-A1.7**
Impact of Body Size on Dosimetry Calculations in Nuclear Medicine: The Need for Size-Dependent Computational Phantoms
Villoing D, Huang S, Liu J, Yao J, Summers D, Lee C
National Institutes of Health, University of California, San Francisco

3:00 PM **COFFEE BREAK**
Grand Ballroom D-H

3:30 PM – 5:00 PM **Grand Ballroom BC**

TPM-A2.1
Hopewell Designs Calibration Workshop

Hopewell Designs, Inc. (HDI) is offering a workshop on the calibration of irradiators. Training on calibration encompasses the calibration procedures, data acquisition, uncertainty estimation, and presentation of results. This workshop is designed as a short course to cover the basics of system calibration performed by using a NIST traceable measurement device to record the exposure from radiation source, for free-air or self-contained irradiators. Such calibration service employs a suite of measurement equipment annually certified and traceable to the National Institute of Standards and Technology (NIST) and accredited to the ISO/IEC 17025:2005. Measurements of the absolute or relative exposure can be made over a series of distances for combinations of sources, filters, collimators and attenuators. Measurement results are reported in units traceable to the International System of Units (SI).

Quantitative indications of the quality of calibration results are discussed along with the measurement results to assess their reliability. Each presented measurement result is accompanied with a statement of uncertainty adhering to the Guidance on the Expression of Uncertainty in Measurement. Attention will be paid to quality assurance procedures so traceability at the lowest uncertainty is maintained. All data collected adheres to the recommendations of ANSI323AB-2013 for measurement uncertainty and reproducibility.

This workshop will last approximately 1.5 hrs and is free of charge for all attendees of the 50th Health Physics Society Midyear Meeting.

1:30 PM – 3:00 PM **Grand Ballroom A**

TPM-B1
Instrumentation
Chair: Frazier Bronson

1:30 PM **TPM-B1.1**
Creating Hidex 300 SL Triple Label Quench Curves
Ball KF
National Institutes of Health

1:45 PM **TPM-B1.2**
Experimental Validation of Secondary Neutron Dose from TOPAS with Bubble Detectors
Kuzmin GA, Mille MM, Thompson A, Lee C
National Cancer Institute, National Institute of Standards and Technology

2:00 PM **TPM-B1.3**
Technology Developments in Monitoring Radiological Incidents in the Environment
Menge JP
Bertin Corp

2:15 PM **TPM-B1.4**
Drone UAV Instrumentation Selection Criteria
Menge JP
Bertin Corp

2:30 PM **TPM-B1.5**
Dose Calibrators-Measurements and Quality Assurance
Yusko MA
Capintec, Inc.

2:45 PM **TPM-B1.6**
A Very Portable In-situ Gamma Spectrometer with Collimated CZT Detector
Bronson F, Muller W, Zickefoose J, Herman C
Canberra

3:00 PM **COFFEE BREAK**
Grand Ballroom D-H

3:45 PM – 5:30 PM **Grand Ballroom A**

TPM-B2
Regulatory/Legal Issues
Chair: Margaret Cervera

3:45 PM **TPM-B2.1**
The United States Nuclear Regulatory Commission Radiation Protection Computer Code Analysis and Maintenace Program
Bush-Goddard S, Nguyen M
Nuclear Regulatory Commission

4:00 PM **TPM-B2.2**
NRC Evaluation of the Radioactive Source Security Regulations in 10 CFR Part 37
Cervera M, White D
U.S. Nuclear Regulatory Commission

4:15 PM **TPM-B2.3**
Priorities for 2017-2021 Term of the International Commission on Radiological Protection
Clement CH
ICRP

4:30 PM **TPM-B2.4**
Medical Use Of Radiation Is Different — How Do NRC Regulations Reflect This Difference
Langhorst SM
Washington University in St. Louis

4:45 PM **TPM-B2.5**
Medical Use of Radiation is Different — NRC Limitations in Balancing Medical Benefit with Radiation Risk
Langhorst SM
Washington University in St. Louis

5:00 PM **TPM-B2.6**
Introduction of HABIT v2.0 Code
Sun C, Spicer T, Lam K, Haider S
U.S. Nuclear Regulatory Commission, University of Arkansas, Leidos Companies

5:15 PM **TPM-B2.7**
Radiation Protection Challenges in the United Arab Emirates (UAE): A Call for National Action Agenda
*Al Husari Z, Ajaj R**
Federal Authority For Nuclear Regulation - UAE

1:30 PM – 5:00 PM White Flint Ampitheatre

TPM-C
Special Session: Medical Health Physics
Co-chairs: Cari Borrás, Linda Kroger

1:30 PM **TPM-C.1**
The Impact of Regulations on Patient Care
Conley TA
The University of Kansas Hospital

2:00 PM **TPM-C.2**
Establishing Medical Imaging Acquisition Protocols
Mahadevappa M
Johns Hopkins University

2:30 PM **TPM-C.3**
The Evolving Role of the Physicist in Assuring Radiation Therapy Quality and Safety
Williamson J
University of Virginia

3:00 PM **COFFEE BREAK**
Grand Ballroom D-H

3:30 PM **TPM-C.4**
The Impact of Accreditation Programs on Quality and Safety
Butler PF
American College of Radiology

4:00 PM **TPM-C.5**
The Role of the Radiation Safety Officer in a Medical Environment
Kroger LA
UCDavis Med Center

4:30 PM **DISCUSSION**

WEDNESDAY

6:45 AM – 7:45 AM **Grand Ballroom A**

CEL-5
Radiological Toolbox 3.0.0
Dewji S, Hiller M
Center for Radiation Protection Knowledge, Oak Ridge National Laboratory

6:45 AM – 7:45 AM **White Flint Ampitheatre**

CEL-6
Radioecology 2 – Dose to Biota
Neville DR

8:00 AM – 11:00 AM **Grand Ballroom BC**

WAM-A1
Special Session: Military Health Physics
Co-chairs: MAJ Thomas Rezentes, LTC Harry Stewart

8:00 AM **WAM-A1.1**
US Air Force Health Physics in 2017
Nemmers S
US Air Force

8:15 AM **WAM-A1.2**
US Army Health Physics
Cuellar J
US Army

8:30 AM **WAM-A1.3**
Navy Radiation Health Program and Community
Williams A
US Navy

8:45 AM **WAM-A1.4**
Changing the Permitting Agency for Use of Radioactive Materials
Stewart HM

9:00 AM **COFFEE BREAK**
Grand Ballroom Foyer

9:30 AM **WAM-A1.5**
Revising the Approach: Taking a Total Risk Perspective When Recommending an Operational Exposure Guideline
VanHorne-Sealy JD
US Army Nuclear and Countering WMD Agency

9:45 AM **WAM-A1.6**
Health Physics Considerations During Processing of Radiologically Contaminated Human Remains
Frey JJ, Livingston BE, Falo GA
20th CBRNE Command, Army Public Health Center

10:00 AM **WAM-A1.7**
DoD Biodosimetry Network
Reyes RA, Rezentes TB, Stewart HM, Blakely WF, Romanyukha A, Subramanian U, Hoefer M, Romanyukha L, Mendez M, Boozer D
Department of Homeland Security, US Army Office of the Surgeon General, Defense Health Agency, Armed Forces Radiobiology Research Institute, Naval Dosimetry Center

10:10 AM **WAM-A1.8**
Radiation Dose Assessment by Electron Paramagnetic Resonance and Whole-Body Counting at the Naval Dosimetry Center
Romanyukha A, Reyes RA, Blakely WF, Grypp MD, Williams AS, Sharp T*
Naval Dosimetry Center, Department of Homeland Security, Armed Forces Radiobiology Research Institute

10:25 AM **WAM-A1.9**
Dose Assessment by Multiple Parameter Biodosimetry at AFRRI — DoD Biodosimetry Network
Blakely WF, Subramanian U, Romanyukha L, Mendez M, Hoefer M
Armed Forces Radiobiology Research Institute

10:45 AM **WAM-A1.10**
Large Scale Emergency Dosimetry Based on Epr Spectroscopy: Evaluation of Q-band EPR on Tooth Enamel Mini-Biopsies
*Trompier F, Romanyukha A, Reyes RA**
Institut de Radioprotection et de Sûreté Nucléaire, Fontenay-aux-Roses, France, Naval Dosimetry Center, Uniformed Services University of the Health Sciences

11:15 AM – 12:00 PM **Grand Ballroom BC**

WAM-A2
Medical Health Physics
Chair: Mehdy Jabir

11:15 AM **WAM-A2.1**
A Practical Approach to the Radiation Safety of Implanted Cardiac Devices in Patients Receiving External Beam Radiation Therapy
Jabir M
VA Medical Center

11:30 AM **WAM-A2.2**
Normal Tissue Dose During Breast Cancer Radiotherapy Treatments
Mosher EG, Lee C, Kim S, Choi M, Jones EC, Lee C
National Institutes of Health, University of Michigan

11:45 AM **WAM-A2.3**
Real Time Visualization of High Dose Rate Brachytherapy
Sandwall P, Handley J, Gerrein C, Spitz H
TriHealth Cancer Institute, University of Cincinnati, Canberra Industries

8:00 AM – 8:45 AM **Grand Ballroom A**

WAM-B1
History
Chair: Mike Mahathy

8:00 AM **WAM-B1.1**
The Colonel, the Captain, and the Commander
Johnston TP
NIST

8:15 AM **WAM-B1.2**
Review of Radiation Exposure Aboard USS Nautilus, 1955-1956
Johnston TP
NIST

8:30 AM **WAM-B1.3**
The Future of HPS Meetings — An Update
Mahathy J, Brackett E
ORAU, MJW Corporation

9:00 AM – 10:00 AM **Grand Ballroom A**

WAM-B2
EPA Panel
Co-chairs: Amanda Anderson, Stuart Walker

9:00AM **WAM-B2.1**
US Environmental Protection Agency (EPA) and US Department of Energy (DOE) Panel on the Use of Risk and Dose Assessment Tools
Anderson A, Walker S
US DOE, US EPA

10:00 AM **COFFEE BREAK**
Grand Ballroom Foyer

10:30 AM – 11:45 AM **Grand Ballroom A**

WAM-B3
Environmental
Chair: James Menge

10:30 AM **WAM-B3.1**
Citizen-based Environmental Radiation Monitoring Network
Alemayehu B, McKinzie MG
Natural Resources Defense Council

10:45 AM **WAM-B3.2**
Simple Slides Can Explain Safety of Nuclear Waste Disposal
Brodsky A
Georgetown University

11:00 AM **WAM-B3.3**
Long-lived Airborne Gamma-emitting Particulate Radioactivity in the United States
Lowry RC
US EPA

11:15 AM **WAM-B3.4**
Major Oxide Compositions and its Impact on Radioactivity on Some Rocks Obtained at Varying Depths in Abuja, North Central Nigeria
Maxwell O, Sunday JE, Saeed A, Adewoyin O, Embong Z
Covenant University, Universiti Teknologi Malaysia, Universiti Tun Hussein Onn Malaysia (UTHM)

11:30 AM **WAM-B3.5**
Methodology for Determination of Radon Soil Concentration
Menge JP
Bertin Corp

8:15 AM – 10:45 AM White Flint Ampitheatre

WAM-C1
Special Session: Research Reactor Decommissioning
Chair: Bruce Watson

8:15 AM **WAM-C1.1**
The Regulator's View for Successful Research Reactor Decommissioning
Watson BA, Smith TB, Hickman JB
US NRC

8:30 AM **WAM-C1.2**
University of Arizona Research Reactor Decommissioning Project
Giebel S, Hickman J, Watson BA
US NRC

8:45 AM **WAM-C1.3**
Worcester Polytechnic Institute Decommissioning Project
Watson BA, Roberts M, Kurian V, Smith TB
US NRC

9:00 AM **WAM-C1.4**
University of Michigan Ford Research Reactor Decommissioning Project
Giebel S, Smith TB
US NRC

9:15 AM **WAM-C1.5**
University of Illinois Research Reactor Decommissioning Project
Watson BA, Hickman JB
US NRC

9:30 AM **WAM-C1.6**
State University of New York at Buffalo Materials Research Center Decommissioning Project
Clements JP, Watson BA, Smith TB
US NRC

9:45 AM **COFFEE BREAK**
Grand Ballroom Foyer

10:15 AM **WAM-C1.7**
Veterans Affairs Omaha Research Reactor Decommissioning Project
Giebel S, Conway K, Schlapper G
US NRC

10:30 AM **WAM-C1.8**
The IAEA Research Reactor Decommissioning Demonstration (R2D2) Project: Sharing U.S. Decommissioning Experience
Watson BA, Hickman JB, Smith TB, Vitkus T, Rowatt JH, Ljubenov V
US NRC, Oak Ridge Associated University, International Atomic Energy Agency

11:00 AM – 11:30 AM White Flint Ampitheatre

WAM-C2
Decommissioning
Chair: Todd Jackson

11:00 AM **WAM-C2.1**
U.S. Nuclear Regulatory Commission (NRC) Non-Military Radium Program Overview
Jackson T, Browder R
US NRC

11:15 AM **WAM-C2.2**
Recent NRC Experience Regulating Radium 226
Jackson TJ
USNRC Region I

AMERICAN ACADEMY OF HEALTH PHYSICS

Saturday, 21 January 2017 • 8:00 am-5:00 pm • Bethesda North Marriott Hotel

AAHP Course #1

ANSI N13.1, Nuances, Facts and Fiction

Brent Blunt

Location: Glen Echo

American National Standard Institute (ANSI) N13.1 provides the basic criteria for sampling of radiological emissions for stacks and vents. Older plants utilize the 1969 version, while newer plants and some plants with modifications are required to upgrade to the 1999/2011 version of the Standard (the 1999 version of the Standard was reaffirmed in 2011). The 1999 version of the Standard was a major rewrite and incorporates a performance-based approach to sampling. After 17 years of implementing the revised Standard, there are numerous nuances that have come to light and there are several ideas about implementation that are fiction. This course will cover the basics of collecting a representative sample from stacks and ducts using the 1999/2011 version of ANSI N13.1. In addition, the subjects of how the Standard applies to off-normal or accident releases will be addressed and how to upgrade a 1969 compliant system to the 1999 version.

AAHP Course #2

Radiation Risk Assessment

Fred Dolislager (The University of Tennessee)
Stuart Walker, (EPA Office of Superfund Remediation and Technology Innovation)

Location: Forest Glen

Radiation Risk Assessment is a full-day advanced course that focuses on specific technical and regulatory issues that Remedial Project Managers (RPMs) and On-Scene Coordinators (OSCs) address when managing Superfund sites that have a risk assessment conducted for radioactive contaminants. By taking the course, participants achieve the following objectives:

- Learn a step-by-step approach to the Superfund remedial program's risk assessment process for radioactive contamination. The course discusses of the major steps in Superfund remedial program's risk assessment for radioactive contamination and the EPA recommended guidance documents and calculators and or models for conducting such risk assessments.
- Explore methods for conducting site-specific risk assessments. The course examines how to alter the default input parameters in the Superfund remedial program's risk calculators.
- Discover practical recommendations for improving the radiation risk assessments conducted at your site. The course stresses some obvious and other less obvious aspects helpful in improving the radiation risk assessment process.
- Master information about the radiation risk assessment process. Participants obtain information from experienced professionals about the radiation risk assessment process.

The instructional methodology for this course includes lectures and demonstrations of using EPA's risk and dose assessment calculators developed by the Superfund remedial program. The target audience for this course is RPMs, OSCs, risk assessors and others that want to obtain a working knowledge on conducting Superfund radiation risk assessments.

PROFESSIONAL ENRICHMENT PROGRAM (PEP)

Sunday, 22 January, 2017 • Bethesda North Marriott Hotel

Sunday 8:00 AM – 10:00 AM

1-A Emergency Response Training for First Responders Made Simple; the Department of Energy's MERRTT – Part 1

T. Clawson and M. Linsley
Technical Resources Group, Inc.

Location: Salon A

Excellent materials exist for training first responders (firefighters, HAZMAT, law enforcement, emergency medical technicians, etc.) on how to respond to a transportation incident involving radioactive material. Participants who successfully complete the PEP 1-X, 2-X, and 3-X sessions will be certified to teach materials contained in the Department of Energy's Transportation Emergency Preparedness Program's Modular Emergency Response Radiological Transportation Training (MERRTT).

The full MERRTT is a 16-hour program consisting of multimedia rich training material that includes PowerPoint presentations, videos, practical exercises, student guides, instructor guides, test material, and regionally available training aids. MERRTT takes the complex topic of a radiological accident response and breaks it down into 16 easily understood modules and hands-on practical exercises. Attendees of a MERRTT program are presented with information that simplifies the topic while developing a comprehensive understanding of radioactive material, radiological survey instruments, and decontamination techniques for handling radiologically contaminated victims and resources available to responders during a response. An important element of the training is detailed information on the types of packages used to transport radioactive material. The course includes use of exempt-level radiation sources in the practical exercises to reinforce learning. Upon successful completion of the MERRTT course, students receive a certificate from the Department of Energy's Transportation Emergency Preparedness Program, including up to 10.5 hours of continuing education hours (CEH) for medical response personnel. MERRTT also meets the Waste Isolation Project Plant (WIPP) Land Withdrawal Act training requirements and is listed on the Department of Homeland Security's federally approved courses listing.

This session will be a summary of the program and an initial review of the PowerPoint pesentations. Attendees will need to complete all three sessions (1-A, 2-A, and 3-A) to receive their Instructor certification and DVD of the course material.

1-B RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna — Part 1: RESRADONSITE Code for Human Dose and Risk Assessment

C. Yu

Location: Salon B

The RESRAD Family of Codes is a suite of software tools developed by Argonne National Laboratory for the US Department of Energy (DOE) and US Nuclear Regulatory Commission (NRC). RESRAD family of codes is the industry standard in evaluating contaminated sites. It has been used by health physicists and radiological engineers as a tool for deriving cleanup criteria and radiological dose and risk assessment for releasing contaminated sites. RESRAD family of codes has been widely used in more than 100 countries. It has been applied to numerous sites and over 1000 journal and other papers have been published either based on or citing RESRAD codes. Applications of RESRAD codes include derivation of cleanup criteria, evaluation of remediation alternatives, radiological dose and risk assessment for humans, biota dose assessment, waste disposal facility performance assessment, and emergency response to nuclear incidents. This 3-part PEP is designed to cover dose and risk assessment for humans (Part 1) and nonhuman biota (Part 2), and comparison of RESRAD to Environmental Protection Agency's (EPA's) PRG and DCC Calculators used for CERCLA sites (Part 3). It is recommended to take 3 parts in sequence, but each part is designed so that it is a stand-alone session with minimal overlapping with other parts.

Part 1: Presents an overview of the RESRAD Family of codes and the methodology used in RESRAD-ONSITE code for human dose and risk assessment. The pathway analysis methodology will be discussed in detail. The parameters and data required in dose analysis, including dose coefficients and risk slope factors will be discussed. The verification and validation of the RESRAD codes will also be presented.

1-C Update to U.S. DOT Regulations

S. Austin
Plexus Scientific

Location: Salon C

The harmonization of domestic and international standards for hazardous materials transportation enhances safety by creating a uniform framework for compliance. Harmonization also facilitates international trade by minimizing the costs and other burdens of complying with multiple or inconsistent safety requirements and avoiding hindrances to international shipments. Harmonization has become increasingly important as the volume of hazardous materials transported in international commerce grows. The U.S. Department of Transportation (DOT) amended the Hazardous Materials Regulations to incorporate changes adopted in the 2009 Edition of the IAEA Safety Standards publication titled "Regulations for the Safe Transport of Radioactive Material, 2009 Edition."

These changes to DOT regulations affect the packaging and transportation of radioactive material. The changes impact marking of packages, reporting of total activity in a package, placarding of certain shipments of LSA-I and SCO-I materials, several key definitions, shipping paper retention requirements, surveys, labeling, and assessment of radiation hazards from packages or conveyance that have been suspected to leak radioactive material. Organizations that are offering packages of radioactive material for transport or transporting these materials need to be aware of these changes and incorporate them into their existing shipping program.

Sunday 10:30 AM – 12:30 PM

2-A Emergency Response Training for First Responders Made Simple; the Department of Energy's MERRTT Train-the-Trainer Program – Part 2

T. Clawson and M. Linsley
Technical Resources Group, Inc.

Location: Salon A

Please see PEP 1-A for a full description of this 3-part program. This session will be a continuation of the PowerPoint presentations and a review of three of the five hands-on practical exercises included in the MERRTT program. Attendees will need to complete all three sessions (1-A, 2-A and 3-A) to receive their Instructor certification and DVD of the course material.

2-B RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna -- Part 2: RESRADBIOTA Code for Biota Dose Assessment

S. Kamboj, C. Yu, and K. McLellan

Location: Salon B

Please see PEP 1-B for the introduction. Part 2 presents the RESRAD-BIOTA code, a biota dose assessment tool designed for demonstrating compliance with the dose rate criteria set in DOE Order 458.1. The development of RESRAD-BIOTA code was sponsored by DOE, with support from NRC and the US Environmental Protection Agency. The RESRAD-BIOTA code provides a complete spectrum of biota dose evaluation capabilities, ranging from generic screening to comprehensive receptor-specific dose estimation. The DOE graded approach methodology and its implementation in the RESRAD-BIOTA code will be demonstrated with examples. The advanced analysis capabilities in RESRAD-BIOTA code, including geometry-based dose coefficients, organism wizard, food chain model, and sensitivity and probabilistic analysis, etc., will be discussed.

2-C A Forgotten Nuclear Accident — Bravo

C. Sun

Location: Salon C

This is a PEP presentation based on decades of personal experience from managing the Marshall Islands Radiological Safety Program (MIRSP) at Brookhaven National Laboratory (BNL). It starts with the selection of Bikini Island for the US Pacific Test Ground in the Republic of Marshall Islands (RMI). Later, on March 1st 1954, the Bravo detonated. Since then, Bikini has never be the same — space and the people. The catastrophic event was resulted (1) from unpredicted weapon yields and (2) by the nuclear debris and fallout reached to the east of many inhabited Atolls.

BNL scientists played an important role on the radiological health and medical care of exposed populations funded by the Department of Energy (DOE) for about 40 years. The MIRSP was established for bioassay monitoring and internal dose assessment. The overview will explain the dose assessment methods include whole-body counting, urinalysis and LLNL's environmental and diet/intake studies. Finally, the presentation summarized and analyzed the operational activity as lesson learned that could applied and implemented to modern emergency planning and accident preparedness.

2-D Fundamentals of Alpha Spectroscopy

B. Davis

Location: Glen Echo

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.

Sunday 2:00 PM – 4:00 PM

3-A Emergency Response Training for First Responders Made Simple; the Department of Energy's MERRTT Train-the-Trainer Program – Part 3

T. Clawson and M. Linsley
Technical Resources Group, Inc.

Location: Salon A

Please see PEP 1-A for a full description of this 3-part program. This session will include a review of the two of five remaining hands-on practical exercises, a 25-question test required for completion of the MERRTT Train-the-Trainer program, and a review of the administrative issues involved in hosting and a completing the DOE's MERRTT program. Attendees will need to complete all three sessions (1-A, 2-A, and 3-A) to receive their Instructor certification and DVD of the course material.

3-B RESRAD Part 3 RESRAD Dose and Risk Assessment Methodology for Humans, Flora, and Fauna -- Part 3: Comparison of RESRAD-ONSITE and EPA PRG and DCC Calculators

J. Cheng, S. Kamboj, and C. Yu

Location: Salon B

Please see PEP 1-B for the introduction. Part 3 presents the RESRAD-ONSITE code, which is used by both DOE and NRC for deriving cleanup criteria or Derived Concentration Guideline Levels (DCGLs) for radioactively contaminated sites. EPA recommends using the Preliminary Remediation Goal (PRG) and Dose Compliance Concentration (DCC) Calculators for CERCLA sites. Understanding the similarity and differences between RESRAD-ONSITE and PRG/DCC Calculators is essential in selecting the appropriate tool for evaluation of contaminated site. This PEP provides an overview of the modeling approach of these three software tools and discusses the key differences in the modeling assumptions, formulations, default parameter values, and their influence on the calculated results.

3-C "Hey, Why Do We..."

C. Ribaudo and M. Roberson

Location: Salon C

This class will be a compilation of skill-testing questions in a quiz format for broad scope licensees to assess their understanding of why certain radiation safety practices are in place. The correct answers are provided along with the NRC regulatory citation so that Radiation Safety Officers and other operational health physicists can have a working knowledge of the regulatory basis for certain — perhaps quirky — requirements. There's more to the rationale (in most cases!) in why we do things besides "We've always done it this way!" It is hoped that questions and answers will generate useful discussion amongst participants and lead to a better understanding of regulatory requirements. A disclaimer from the authors that this class does not substitute as formal guidance from your NRC or State regulatory authority.

3-D Fundamentals of Gamma Spectroscopy

B. Davis

Location: Glen Echo

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-E Health Physics Response: Emergency Response versus Occupational Response

B. Haley

Location: Forest Glen

How Health Physics during a response is different than in an occupational setting. This will be a thoughtful discussion using operational problems to discuss/demonstrate how decision timelines and processes are very different during an emergency than in the work setting. The discussion will focus on integrating health physicists into emergency response organizations and processes.

CONTINUING EDUCATION LECTURES

CELs take place in the Bethesda North Marriott Hotel

Monday 7:00 AM – 8:00 AM

CEL-1 Meeting the National Need: An Overview of the DOE Isotope Program

E. Balkin

Location: Grand Ballroom A

The DOE Isotope Program fills a critical need within the US as a supplier of stable and radioisotopes IN SHORT SUPPLY for the medical, research, industrial, and governmental communities. This talk will provide an overview of the program, its mission, and accomplishments.

CEL-2 Recent Topics in the Field of Low Dose Radiation Biology

N. Metting

Location: White Flint Ampitheatre

The field of low dose radiation biology focuses on biological responses to radiation exposures that are at or near current workplace exposure limits. It was not until the advent of molecular biology that low dose effects could even be measured. Until recently, most molecular studies of radiation effects were carried out using an isolated cell type in monolayer culture, and the responses of those cells were then extrapolated to mammalian tissues and whole organisms. New research indicates that fundamentally different cellular and molecular responses can occur as a function of the level of biological organization (cells, tissues, whole organisms), and that normal, intact tissue responds, in general, differently to radiation than do single cells or monoculture cell populations. Responses of special interest include radio-adaptive responses, systems genetics of inter-individual variation, and low dose and/or low dose-rate effects on proteomic and metabolic responses, the immune system, and epigenetic regulation. Recent progress on several of these topics will be presented.

Tuesday 6:45 AM – 7:45 AM

CEL-3 Dose Coefficients: What are they, where do they come from, and how do we use them?

S. Dewji

Center for Radiation Protection Knowledge, ORNL

Location: Grand Ballroom A

A dose coefficient is a measure of radiation dose (e.g., absorbed or equivalent dose rate, committed equivalent dose, or committed effective dose) to a specified tissue or to the whole body per unit intake of a radionuclide for internal emitters and per unit concentration of a radionuclide in an environmental medium for external irradiation.

For decades, Oak Ridge National Laboratory (ORNL) has led the effort in the computation of internal and external dose coefficients in the support of federal regulations and international guidance. Dose coefficients have applications in a variety of fields, including occupational radiation protection, emergency response, and nuclear medicine. The Center for Radiation Protection Knowledge at ORNL has developed the Dose and risk CoeFicient PAcKage (DCFPAK) software application (https://www.dcfpak.org/), which has archvied the fundamental dose and risk coefficients over the past 36 years. The science behind the history and development of dose coefficients, as well as applications on how to employ dose coefficients will be discussed.

CEL-4 Radioecology 1 – Introduction to Radioecology and Environmental Protection Programs

C.A. Condon

Location: White Flint Ampitheatre

This course will be an introduction to the field of Radioecology and its prevalence in the field of Health Physics. It will begin with a basic introduction to radioecology including natural & anthropogenic sources of radiation as well as basic fate and transport of radionuclides through environmental systems. The course will continue by covering how radionuclides are recommended to be regulated (International Commission of

Radiological Protection & National Council on Radiation Protection) and how they are currently regulated in the environment in the United States (Nuclear Regulatory Commission & Department of Energy). Following this we will discuss how the US regulates and addresses sites with historical contamination of radionuclides that are classified under RCRA (Resource Conservation and Recovery Act) & CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act) and the controversies facing these decisions. Finally, this class will cover the current international state of radioecology (including current controversies on low dose effects to wildlife) and the future of radioecology. [This CEL is ideally to be followed by the other radioecology CEL on dosimetry and modelling which will build off information given in this course.]

Wednesday 6:45 AM – 7:45 AM

CEL-5 Radiological Toolbox 3.0.0

S. Dewji and M. Hiller

Center for Radiation Protection Knowledge, Oak Ridge National Laboratory

Location: Grand Ballroom A

The Radiological Toolbox software developed by Oak Ridge National Laboratory (ORNL) for the U. S. Nuclear Regulatory Commission is designed to provide electronic access to a vast and varied array of data needed in the field of radiation protection and shielding. Such data consolidates physical, chemical, anatomical, physiological, and mathematical parameters, which would otherwise require consulting multiple sources to retrieve this information. This software provides ready access to data of interest in radiation safety and protection of workers and members of the public. The data include dose coefficients for intakes of radionuclides, external exposure to radionuclides distributed in environments, and for exposures to photon and neutron radiation fields. Other supportive data include interaction constants and coefficients for alpha, beta (i.e., electron), gamma (i.e., photon or x-ray) and neutron radiations, nuclear transformation data, biological, radiological and physiological data, and supplemental information on various related topics. The functionality and example problems will be explored to enable participants to harness the full capabilities of this software. The Radiological Toolbox 3.0.0 can be obtained from the U. S. Nuclear Regulatory Commission Radiation Protection Computer Code Analysis and Maintenance Program at https://www.usnrc-ramp.com.

CEL-6 Radioecology 2 – Dose to Biota

D.R. Neville

Location: White Flint Ampitheatre

The components and estimation of doses to biota are covered in this course as well as the relevant endpoints of concern. Biota doses come from a variety of components in the environment, ranging from cosmic/solar, external gamma and internal sources. The contributions from naturally occurring and anthropogenic/ TENORM vary considerably for terrestrial versus freshwater and marine biota, which are each treated in the presentation. Differences in the relative sensitivities and relevant endpoints for each are discussed with regards to Derived Consideration Reference Levels (DCRLs). Methods of calculation of these doses include homogenous ellipsoids as well as more detailed voxel models. Finally, the complexities in the production of these models are covered, including geometry, density, elemental composition and relative compartmentation of radionuclides relative to those found in the surrounding environment.

CEL Courses (Included in registration fee)

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

http://burkinc.net/HPS2017MYPEP.php

CEL1-8816
CEL2-9865
CEL3-1427
CEL4-2057
CEL5-2411
CEL6-8743

AUTHOR INDEX

A

Adewoyin O 10, 18
Ajaj R 16
Alemayehu B 18
Anderson A 18
Anderson E 13

B

Balkin E 8
Ball KF 15
Bellamy MA 9
Benevides E 13
Benevides L 10
Blakely WF 17
Boice J 8
Bolus K 9
Boozer D 17
Borras C 12
Bouville AC 9
Bower M 13
Boyd M 13
Boyd MA 12
Brackett E 18
Brodsky A 18
Bronson F 15
Browder R 19
Bush-Goddard S 15
Butler PF 16

C

Camphausen K 9
Cervera M 15
Chang L 13
Choi M 18
Clement CH 15
Clements JP 19
Cogliani L 11
Condon CA 11
Conley TA 16
Connolly DA 11
Conway K 19
Cool DA 8, 9
Cuellar J 17

D

Dauer L 9
Dewji S 11, 12, 14, 17
Dolislager FG 9, 10

E

Easterly C 14
Eckerman K 12, 14
Elder D 11
Embong Z 10, 18

F

Falo GA 17
Fisher TE 14
Flannery C 11
Frey JJ 17

G

Galata E 10
Galloway LD 9
Garrison LM 11
Gerontidou M 10
Gerrein C 18
Giebel S 19
Grypp MD 17
Guarino SN 12

H

Haider S 15
Handley J 18
Hanson DJ 12
Harris W 9
Hayes R 9
Held K 8
Herman C 15
Hertel N 12, 14
Hickman J 19
Hickman JB 19
Hiller M 12, 14, 17
Hoefer M 17
Hope Z 12
Howe D 12
Huang S 14

I

Ioannidou SP 10

J

Jabir M 18
Jackson T 19
Jackson TJ 19
Jeon IY 12
Johnson RH 9, 12
Johnston Thomas P 10
Johnston TP 18
Jones EC 18

K

Keith S 13
Kim K 13
Kim S 18
Kindrick S 9
Kroger LA 16
Krop R 9
Kurian V 19
Kuzmin G 14
Kuzmin GA 15

L

Lam K 15
Langhorst SM 15
Lee C 14, 15, 18
Leidholdt E 13
Linet MS 13
Little CA 11
Littleton B 14
Liu J 14
Livingston BE 17
Ljubenov V 19
Lowry RC 18

M

Mahadevappa M 16
Mahathy J 18
Marschke S 14
Mavromichalaki H 10
Maxwell O 10, 18
Mayer D 13
McKinzie MG 18
Melo DR 13
Mendez M 17
Menge JP 15, 19
Metting N 8
Mickum S 12
Mille MM 14, 15
Miller DL 13
Moroz B 13
Mosher EG 18
Muller W 15

N

Nemmers S 17
Nesky AB 12
Neville DR 17
Nguyen M 15
Ntakos G 10

O

Ochs RA 13
Olszewska-Wasiolek MA 12

P

Paravolidakis K 10
Paschalis P 10
Pawel DJ 9
Peake T 8
Prevost D 12

Q

Quinn D 13

R

Reed L 14
Reyes RA 14, 17
Rezentes TB 17
Ribaudo C 9
Roberts M 19
Romanyukha A 17
Romanyukha L 17
Rowatt JH 19
Rubin WM 11
Rushton R 12

S

Saeed A 10, 18
Sandwall P 18
Schlapper G 19
Schlueter J 8
Scott AL 11
Shannon DJ 13
Sharp T 17
Shore R 9
Shore RE 12
Shubayr N 9
Simon SL 13
Smith DA 10
Smith TB 19
Spicer T 15
Spitz H 18
Stewart HM 17
Subramanian U 17
Summers D 14
Sun C 15
Sunday JE 10, 18

T

Tarzia J 13
Tezari A 10
Thomas J 13
Thompson A 15
Trompier F 17

V

VanHorne-Sealy JD 11, 17
Veinot K 14
Villoing D 14
Vitkus T 19
Voegtli VL 12

W

Wagiran H 10
Walker S 9, 18
Walker SA 10
Walker SH 9
Watson BA 19
White AD 8
White D 15
Williams A 17
Williams AS 17
Williamson J 16
Woodward N 8

Y

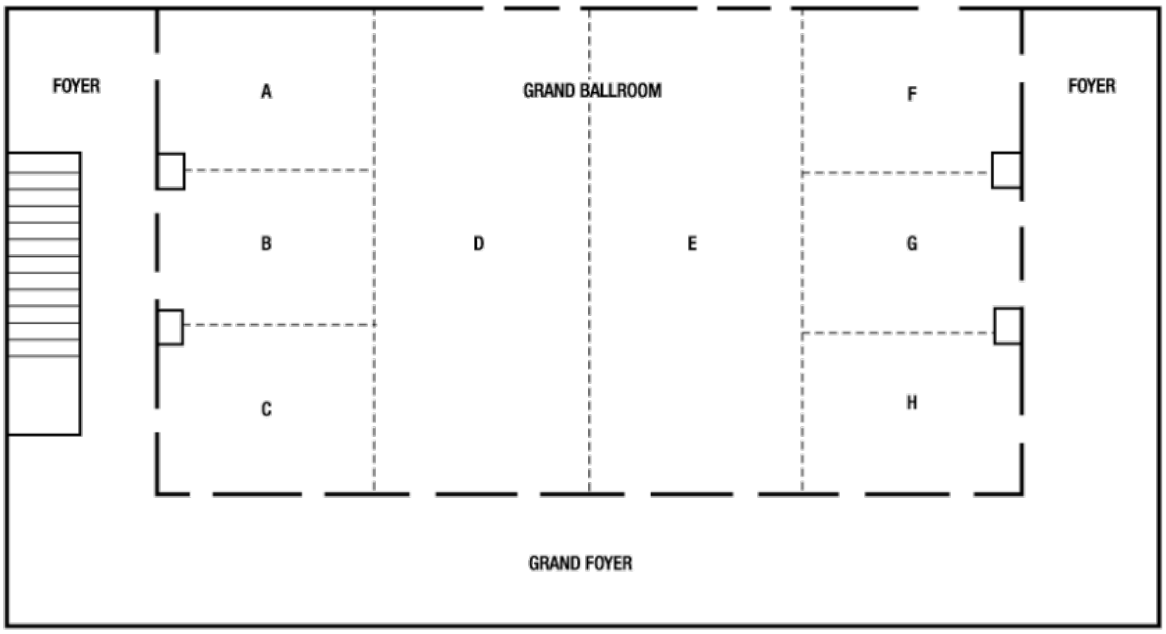
Yao J 14
Yusko MA 15

Z

Zickefoose J 15
Zimmerman BE 14

BETHESDA NORTH MARRIOTT HOTEL FLOOR PLANS

MAIN LEVEL



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