Health Physics Society Midyear Meeting

Issues in Waste Management

2012 Topical Meeting of:
Health Physics Society
(The Forty-Fifth Midyear Topical Meeting of the Health Physics Society)
American Academy of Health Physics

AAHP

NRRPT

ABHP

Sunday 5 February -
Wednesday 8 February 2012

Final Program

Dallas, Texas
The Fairmont Dallas

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Health Physics Society Committee Meetings

All Committee Meetings are in the Dallas Fairmont

Saturday, February 4, 2012

FINANCE COMMITTEE
8:00 am - Noon — *Directors Room*

ABHP PART II PANEL WORKSHOP
8:00 am - 5:00 pm — *Terrace Room*

NRRPT BOARD AND PANEL
9:00 am - 4:00 pm — *Royal Room*

HPS EXECUTIVE COMMITTEE
Noon - 5:00 pm — *President's Suite*

Sunday, February 5, 2012

AAHP EXECUTIVE COMMITTEE
8:30 am - 5:00 pm — *Executive Room*

ABHP PART II PANEL WORKSHOP
8:00 am - 5:00 pm — *Terrace Room*

HPS BOARD OF DIRECTORS
8:00 am - 5:00 pm — *Far East Room*

NRRPT BOARD AND PANEL
9:00 am - 4:00 pm — *Royal Room*

PROGRAM COMMITTEE
10:00 am - Noon — *Florentine Room*

HPS/ANSI 42.54
1:30 - 5:30 pm — *French Room*

Monday, February 6, 2012

EXECUTIVE BOARD OF DECOMMISSIONING SECTION BREAKFAST MEETING
9:00 - 10:00 am — *Directors Room*

NRRPT BOARD AND PANEL
9:00 am - 4:00 pm — *Royal Room*

HISTORY COMMITTEE
Noon - 2:00 pm — *Directors Room*

HPS N13.3
1:00 - 5:00 pm — *Board Room*

ANSI N42.323AB
2:00 - 5:30 pm — *Directors Room*

Tuesday, February 7, 2012

SOUTH TEXAS CHAPTER BREAKFAST MEETING AND EXECUTIVE COUNCIL
7:00 - 10:00 am — *Panorama Room*

NRRPT BOARD AND PANEL
9:00 am - 4:00 pm — *Royal Room*

ANSI N42.58
9:30 am - Noon — *Executive Room*

HOMELAND SECURITY COMMITTEE
4:30 - 6:00 pm — *Executive Room*

Wednesday, February 8, 2012

LAB ACCREDITATION POLICY COMMITTEE
8:00 - 10:00 am — *Directors Room*

LAB ACCREDITATION ASSESSMENT COMMITTEE
10:00 am - Noon — *Directors Room*

PROGRAM COMMITTEE
12:30 - 2:00 pm — *Florentine Room*

AD HOC COMMITTEE ON LAB ACCREDITATION POLICY
12:30 - 2:30 pm — *Directors Room*

SCIENTIFIC AND PUBLIC ISSUES COMMITTEE
1:00 - 3:00 pm — *Board Room*

Thank you to our Sponsors:
GCR & Associates, Inc - Silver Sponsor
Dan Caulk Memorial Fund

Table of Contents

Registration Hours
Exhibit Hall Foyer

Sunday, February 5 . . . . . 3:30-6:30 PM
Monday, February 6 . . . . . 7:30 AM-3:00 PM
Tuesday, February 7 . . . . . 8:00 AM-3:00 PM
Wednesday, February 8 . . . . . 8:00 AM-Noon

Exhibit Hours
Regency Ballroom

Monday	5:15-6:15 PM	Opening Reception
Tuesday	9:30 AM-4:15 PM	Exhibits Open
	9:45-10:15 AM	Refreshment Break
	12:15-1:15 PM	Exhibitor Sponsored Lunch
	3:15-3:45 PM	Refreshment Break
Wednesday	9:30 AM-Noon	Exhibits Open
	9:45 - 10:15 AM	Continental Breakfast

Speaker Ready Room
Florentine Room

Sunday	1:00-5:00 PM
Monday & Tuesday	8:00 AM-Noon; 1:15-5:00 PM
Wednesday	8:00-11:00 AM

Join us this summer in Sacramento, California! 22-26 July 2012

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

Tours…..Events….. Tours…..Events…..

Sunday 5 February

Welcome Reception - *Super Bowl Party!*

5:15 pm - End of Game **Venetian Room**

Plan on stopping in for the HPS Welcome Reception. There will be an opportunity to meet friends and to start your evening in Dallas. Cash bar and hot dogs, popcorn, dips and chips (game food!) will be available. Come watch the Super Bowl on the big screen!

Monday 6 February

Exhibitor Opening Reception

5:15-6:15 pm **Regency Ballroom**

Join the Exhibitors for food, a cash bar, and the latest in Health Physics equipment.

Tuesday 7 February

Complimentary Lunch in Exhibit Hall

12:15-1:15 pm **Regency Ballroom**

TECHNICAL TOURS

Tuesday, February 7

The University of Texas Southwestern Medical Center Waste Handling Facility

3:30-5:30 PM **Onsite $25**

Tour is limited to 30 participants

The University of Texas Southwestern Medical Center Waste Handling Facility is a self standing 7000+ sq.ft. site designed in 2005 to handle Radioactive, Chemical, Biological and Universal waste from a large Medical Research Institution. It integrates security control and access, with laboratory functions and the central receiving and processing of Radioactive Materials packages for the authorized laboratories. The facility handles short lived solid waste, compaction of long lived solid waste, refrigeration of radioactive animal carcasses, shredding of Liquid Scintillation mixed waste vials and storage of sealed sources. The facility also handles storage of chemical, biological and medical waste, bulking of chemical solvents, storage of mixed waste, lab-packing for chemical waste, refrigeration of chemical waste, and storage of universal waste.

Job Openings/Resumes

Post your printed job opening or resume on the "Job Boards" in the Exhibit Hall

PUB CRAWL

Tuesday, February 7

6:00-10:00 PM **Onsite $25**

Come join us for a tour down famous McKinney Ave., home of many entertaining and interesting drinking establishments. We will visit 4 local pubs, each with its own atmosphere and specials. We will spend about an hour at each place. All locations are along McKinney Ave. and are within walking distance of each other, and all locations are a trolley ride from the hotel. Participants will receive a light blue t-shirt and souvenir glass.

DALLAS, TEXAS

Welcome to Dallas!

Dallas, Texas, is the ninth-largest city and part of the fourth-largest metropolitan area in the nation. Dallas covers approximately 343 square miles and has a population of 1,299,543. The ultramodern and sophisticated city attracts worldwide travelers, making the area the number one visitor and leisure destination in Texas.

Once in Dallas, visitors can ride one of the fastest-growing light-rail systems in the nation or the historic, free McKinney Avenue Trolley from the Dallas Arts District throughout the Uptown area with its restaurants, pubs, boutique hotels, and shops.

Throughout the city, a visitor will enjoy the best shopping in the southwest, four- and five-diamond/star hotels and restaurants, the largest urban arts district in the nation, 13 entertainment districts, and much more. Blend in moderate weather, year-round sports, and true Southern hospitality for a true "taste" of the Dallas difference. Visitors are exposed to a city that models its slogan, "Live large. Think big.™" Its pioneering spirit is alive and well, and the philanthropic contributions from its many residents continue to enrich the community and quality of life.

Headquarters Hotel

Dallas Fairmont

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Dallas, TX 75201

214-720-2020; FAX: 214-720-7405

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Exhibits are located in Regency Ballroom

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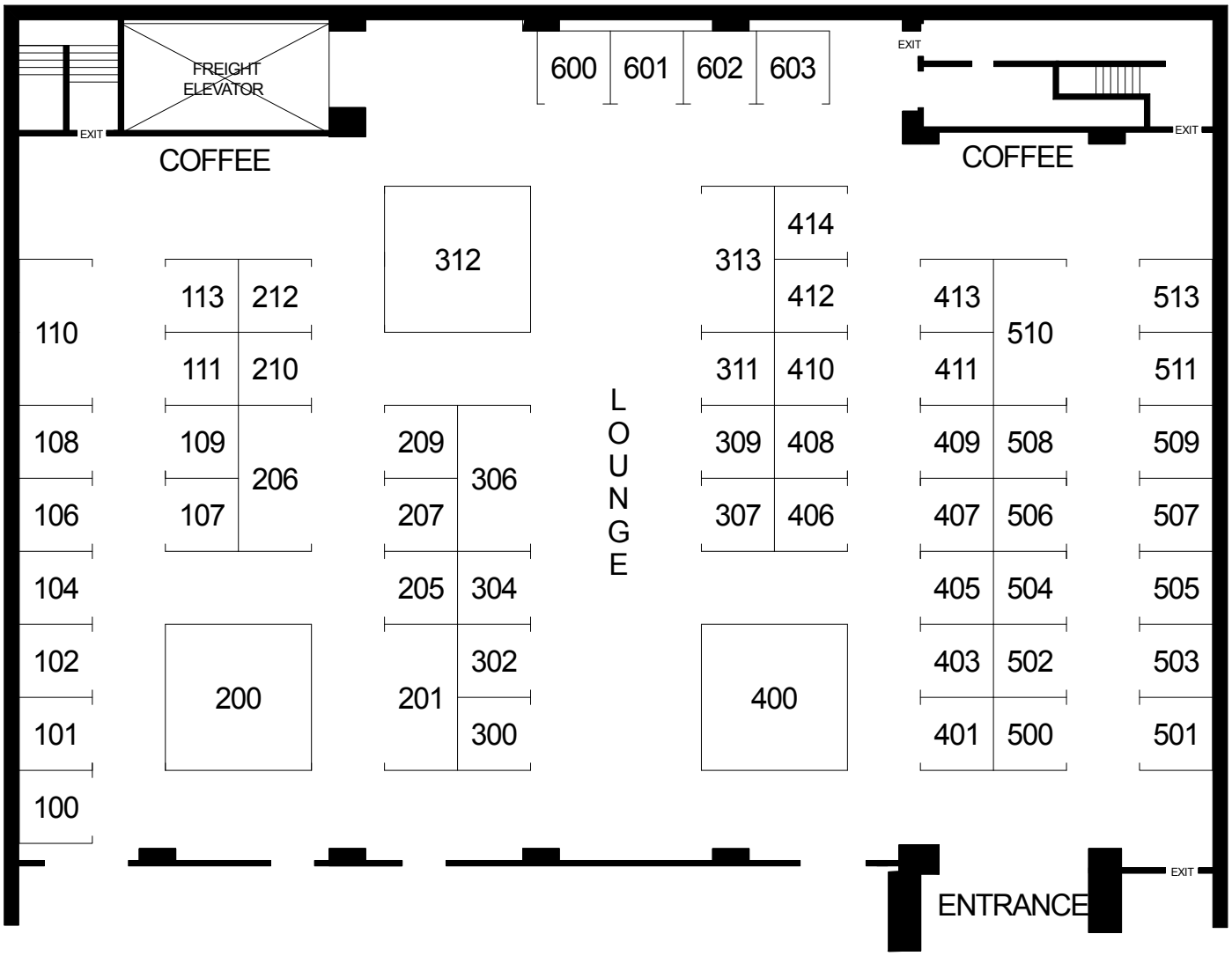

2012 HPS Midyear Meeting Exhibitors

Exhibits are located in the Regency Ballroom

2012 Annual Meeting **Ballroom Lobby**
Sacramento, California

2013 Midyear Meeting **Ballroom Lobby**
Scottsdale, Arizona

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HPS Journal **Ballroom Lobby**

HPS Laboratory Accreditation Program **Booth: 309**

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Ludlum Measurements **Booth: 312**
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Philotechnics, Ltd. is the premier radiological services group in the country. We provide turn-key LLRW and Mixed Waste Brokerage Services, Decontamination and Decommissioning, and associated Health Physics consulting services. Philotechnics has licensed facilities in Oak Ridge, TN, and San Diego, CA, and provides services to a nationwide customer base of both commercial and federal clients. "Solutions are our Business"

Qal-Tek Associates **Booth: 102**
3998 Commerce Circle
Idaho Falls, ID 83401
888-523-5557; FAX: 208-524-8470
www.qaltek.com

Qal-Tek Associates is a leading service provider for Radioactive Source Disposal services and radiological instrument calibration and repair. Our disposal services offer some of the lowest cost and most innovative disposal options available. Complete with an ISO 17025 Accreditation and the best customer service in the industry, our calibration services are unsurpassed. Additionally we offer a full spectrum of radiation safety support services such as training, assessments, leak testing, decontamination and procedure and license assistance.

Radiation Safety & Control Services, Inc. **Booth: 403**
91 Portsmouth Ave
Stratham, NH 03885
603-778-2871; FAX: 603-778-6879
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 Safety Associates, Inc. **Booth: 504**
19 Pendleton Drive
PO Box 107
Hebron, CT 06248
860-228-0487; FAX: 860-228-4402
www.radpro.com

Radiation consulting services, radiochemical analysis/ lab services, instrument calibration & repair, decontamination & decommissioning, professionalpublications (journals & reference books) and software and detection equipment for HPs.

Radiation Solutions Inc. **Booth: 205**
386 Watline Ave
Mississauga, ON L4Z 1X2
Canada
905-890-1111; FAX: 905-890-1964
www.radiationsolutions.ca

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 , ID, Mapping and Directional capabilities. In addition, vehicle portal monitoring systems are also produced primarily for the scrap metal recycling industry.

RSO, Inc. **Booth: 503**
PO Box 1450
Laurel, MD 20725-1450
301-953-2482; FAX: 301-498-3017
www.rsoinc.com

RSO, Inc. offers a variety of radioactive waste management and disposal servies. We operate a fully permitted and lic ensed facility and vehicles. our turnkey disposal services are tailored to meet th eneeds of both small and large generators. We offer decommissioning services for any size project.

Saphymo GmbH **Booth: 411**
Heerstrasse 149
Frankfurt/Main Germany 60488
49-0-69976514-52; FAX: 49-0-6976532
www.saphymo.de

Saphymo provides handheld measurement devices and systems for radiation protection for the environmental protection, nuclear industry, research centers and homeland security. Product lines are environmental monitoring networks, contamination, dosimetry, portal monitors and radon. Particularly former Genitron Instruments GmbH, Frankfurt, Germany, provides state-of-the-art low-power systems with proprietary radio transmission to US customers as US EPA, DoE, NIST and other public institutes also proven in waste management applications.

SE International, Inc. **Booth: 506**
PO Box 39, 436 Farm Road
Summertown, TN 38483
800-293-5759; FAX: 931-964-3564
www.seintl.com

S.E. International, Inc., manufacturer of the Radiation Alert® product line, offers handheld ionizing radiation detection instruments including Geiger counters, dosimeters, and multi-channel analyzers for surface and air contamination. Proven reliable in environmental, industrial, laboratory, research, Health physics, educational fields. Introducing Gammapal portable food soil contamination lab.

Technical Associates **Booth: 100**
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Canoga Park, CA 91303
818-883-7043; FAX: 818-883-6103
www.tech-associates.com

Recent additions to TA's Health Physics instrument line include air and area monitors, which are smarter, more sensitive and more rugged than previously available, in addition to pipe and plume and the latest advances in portables.

Teletrix **Booth: 302**
PO Box 14209
Pittsburgh, PA 15239
412-798-3636; FAX: 412-798-3633
www.teletrix.com

Teletrix creates innovative solutions in Radiation Training Simulators to educate, prepare and protect those in radiation-related industries such as nuclear power, first response, the military, state and local government, hospitals, educational institutions and others. Made in the USA since 1988, our products support safe, hands-on, practical learning without the use of radioactive sources.

ThermoFisher **Booth: 510**
One Thermo Fisher Way
Oakwood Village, OH 44146
440-703-1444

Radiation detection instruments and systems used by the nuclear industry, DoE National laboratories, National and international safeguard organizations, defense and law enforcement agencies. Pioneering radiation technologies paired with state-of-the-art electronics that allow use to easily make informed decisions when evaluating radiation levels.

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714-997-8090; FAX: 714-997-3561
www.tgainc.com

Thomas Gray & Associates, Inc., also representing Environmental Management & Controls, Inc. (EMC) and RWM-Utah, Inc., offers a full line of Health Physics services including LLRW disposal, consolidation, transportation, site remediation and HP services.

US Army Health Care Recruiting **Booth: 409**
2505 N Highway 360, Suite 700
Grand Prairie, TX 75050
877-862-0338; FAX: 812-633-6772
www.healthcare.goarmy.com

Waste Control Specialists. LLC **Booth: 110**
Three Lincoln Centre
5430 LBJ Freeway, Ste 1700
Dallas, TX 75240
435-649-3467; FAX: 972-448-1419
www.wcstexas.com

WCS offers comprehensive waste management services at our treatment, processing, storage and disposal facilities located in the arid west Texas desert. WCS is the first commercial facility to offer disposal of Class A, B, and C LLRW from federal and commercial facilities. In addition WCS provides treatment, processing and storage of LLRW, GTCC waste, transuranic waste and sealed sources. WCS enjoys strong community support and places an emphasis on safety and protecting the environment.

WB Johnson Instruments **Booth: 104**
3998 Commerce Circle
Idaho Falls, ID 83401
208-557-6945; FAX: 208-557-6946
www.jradmeters.com

As a provider of handheld radiation detection instruments, WB Johnson Instruments, formerly William B Johnson, is a leader in the manufacturing of the most reliable and durable radiation detection products in the industry. Since recently acquired in September 2011, the product line has been expanded to a brand new line of digital and analog survey as well as Portable and Fixed portal monitors. Check out our new line at www.jradmeters.com

Final Technical Program

If a paper is going to be presented by other than the first author, the presenter's name has an asterisk (*)

Sessions will take place in the Fairmont Dallas

MONDAY

7:00-8:00 am — Gold Room

CEL 1 ABHP Exam Fundamentals
Gus Potter, Patrick LaFrate

7:00-8:00 am — International Ballroom

CEL 2 HPS Laboratory Accreditation Program Introduction to Uncertainty Calculations Part 1
Daniel VanDalsem
Eckert & Ziegler Isotope Products

8:15 am-Noon — International Ballroom

MAM-A Plenary Session

Chair: Kathy Pryor

8:15 am
Welcome & Announcements
Kathy Pryor
President, HPS

8:30 am **MAM-A.1**
Texas: The Path and Policy to Radioactive Waste Disposal
Jablonski S
Texas Commission on Environmental Quality

9:00 am **MAM-A.2**
An Update on the Texas Compact Low-Level Radioactive Waste Disposal Facility
Baltzer R
Waste Control Specialists LLC

9:30 am **MAM-A.3**
Radioactive Waste – Past, Present and Future Policies and Regulatory Issues
Magette T
Energy*Solutions*

10:00 am **Break**

10:30 am **MAM-A.4**
A Perspective on Waste and Fuel Cycle Issues in a Post Fukushima World
Magwood WD
US Nuclear Regulatory Commissioner

11:15 am **MAM-A.5**
Radioactive Waste Management: Where Do We Go from Here?
Jacobi R
Jacobi Consulting

11:45 am **Roundtable Discussion**

1:15-2:30 pm — International Ballroom

MPM-A The Name of Our Society - Is It Finally Time to Consider Changing It?

Chair: Armin Ansari

2:30-3:45 pm — International Ballroom

MPM-B Policies and Regulatory Issues

Co-Chairs: Paul Ward, Karen Langley

2:30 pm **MPM-B.1**
Prevention of Unauthorized Disposal of Radioactive Material in Solid Waste and Scrap Recycling Facilities: Role of State Radiation Control Programs and Resources Available
McBurney RE, Meyer CR
Conference of Radiation Control Program Directors, Inc. (CRCPD)

2:45 pm **MPM-B.2**
The Psychology of Radioactive Waste Disposal
Johnson R
Radiation Safety Counseling Institute and Dade Moeller

3:00 pm **MPM-B.3**
Sealed Source Security and Commercial Disposition: Progress, Prospects, and the Path Ahead
Cuthbertson A, Cocina F, Jennison M, Martin D
National Nuclear Security Administration, Office of Global Threat Reduction, Los Alamos National Laboratory, National Nuclear Security Administration/Pacific Northwest National Laboratory, National Nuclear Security Administration/Energetics Incorporated

3:15 pm **MPM-B.4**
Technical and Policy Approaches to Managing Waste from Radiological Incidents
Peake RT, Schultheisz DJ, Czyscinski KS, Lemieux PM, Boe TR, Michael JF, Ierardi M, Parrish CS, Rodgers MM
US Environmental Protection Agency, Eastern Research Group

3:30 pm **MPM-B.5**

Health Physics Society Positions on Waste Disposal

Vetter RJ, Pryor KH

Health Physics Society, Pacific Northwest National Laboratory

3:45 pm **BREAK**

4:15-5:15 pm **International Ballroom**

MPM-C Radioactive Waste Past, Present and Future

Co-Chairs: Paul Ward, Karen Langley

4:15 pm **MPM-C.1**

Low Activity Waste: Navigating a Pathway for Disposal

Hamrick BL

University of California Irvine Medical Center

4:30 pm **MPM-C.2**

Health Effects from Exposure to Natural and Depleted Uranium

Keith LS, Wilbur S, Ingerman L, Faroon O, Scinicariello F, Roney N

ATSDR, SRC

4:45 pm **MPM-C.3**

Activities of the Southeast Compact Commission for Low-level Radioactive Waste Management

Lanza J

Florida Department of Health

5:00 pm **MPM-C.4**

The Source Collection and Threat Reduction Program: What It Is, Where It Is, Where It Will Be

Meyer R, McBurney RE

Conference of Radiation Control Program Directors, Inc. (CRCPD)

5:15-6:15 pm **Regency Ballroom**

Exhibitor Opening Reception

TUESDAY

7:00-8:00 am Gold Room

CEL 3 The Psychology of Radioactive Waste Disposal
Ray Johnson
Radiation Safety Counseling Institute

7:00-8:00 am International Ballroom

CEL4 HPS Laboratory Accreditation Program Introduction to Uncertainty Calculations Part 2
James Tarzia
Radiation Safety & Control Services

8:30-9:45 am International Ballroom

TAM-A Academic, Medical and Nuclear Waste

Co-Chairs: Mike Davidson, Wayne Gaul

8:30 am TAM-A.1
Challenges in Managing College Radwaste Projects
Dibblee MGK, Kay MA
Ambry, Inc.

8:45 am TAM-A.2
Design and Relocation of a Research University's Low-Level Radioactive Waste Storage Facility
Tabor C, Zakir N, Spichiger G
Georgia Tech

9:00 am TAM-A.4
Thermal Characteristics and Radiotoxicity Analysis of the Advanced PWR Spent Fuels for Safe Storage Management Plan
Faruk MG, Pfeil AL, Aghara S, Vasudevan L*
Prairie View A&M University, Texas A&M University

9:15 am TAM-A.5
Nuclear Medicine Research and Development Waste Management
Quinn BM, Dauer LT
Memorial Sloan Kettering Cancer Center

9:30 am TAM-A.6
Unique Challenges and Lessons Learned from Management of Unconventional Waste at Old Universities
Inyang O, Nam S, Williams S
University of Houston

9:45 am BREAK in Exhibit Hall
sponsored by Dan Caulk Memorial Fund

10:15 am-12:15 pm International Ballroom

TAM-B Environmental Issues

Co-Chairs: Wayne Gaul, Andrew Thatcher

10:15 am TAM-B.1
Decontamination Alternatives In Decommissioning Projects
Gaul W
Tidewater

10:30 am TAM-B.2
Savannah River Site Composite Analysis Monitoring Plan
Crapse KP, Phifer MA, Smith FG, Jannik GT, Millings MR*
Savannah River National Laboratory

10:45 am TAM-B.3
Implementation of Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) in Environmental Monitoring Programs at a Low-Level Waste Facility
Matthews T, Kirk M, Zychowski G, Kirk S
WCS

11:00 am TAM-B.4
RACER: A Data Analysis Tool Used to Evaluate Potential Environmental Impacts at a New Low-Level Radioactive Waste Disposal Facility
Kirk S, Matthews T, Kirk M, Zychowski G
WCS

11:15 am TAM-B.5
Performance Assessment for Delaying Installation of an Infiltration Reducing Cover at the Low Level Radioactive Waste Site in Richland, Washington in Support of the Final Environmental Impact Statement
*Rood AS, Thatcher AH**
K-Spar Inc.

11:30 am TAM-B.6
Improving Radwaste Soil Estimates with Gamma Logs
Flynn CRF
Health Physics Consultants

11:45 am TAM-B.7
Updating a Deterministic Modeling Design from RESRAD to GoldSim: Examining a Highly Engineered Low-Level Waste Disposal Facility
Shaw C, Kirk S, Dornsife B
WCS

Noon **TAM-B.8**

Discovery of Unexpected Waste Stream Radionuclide of Concern

*Miller GP, Hay S, Mason TR**

Cabrera Services, Inc.

12:15-1:15 pm **Regency Ballroom**

Complimentary Lunch in Exhibit Hall

1:15-3:15 pm **International Ballroom**

TPM-A WIPP-Special Session

1:15 pm **TPM-A.1**

The Waste Isolation Pilot Plant-Update on Operational Performance and Exciting New Developments

Hayes RB

WIPP

2:00 pm **TPM-A.2**

Comparing Defense TRU Waste Disposal Costs at WIPP with Class C Low-Level Waste Disposal Costs at Waste Control Specialists

*Nelson R, Hayes R**

WIPP

2:15 pm **TPM-A.3**

Use of Health Physics at the Waste Isolation Pilot Plant (WIPP)

*Nelson, R, Hayes RB**

DOE/CBFO, Washington TRU Solutions LLC, WIPP

3:00 **TPM-A.4**

Use of a Portable HPGe for Counting Smears and Air Filters

Hayes RB

WIPP

3:15 pm **BREAK**

3:30-5:30 pm **Meet in Lobby**

Technical Tour
University of Texas Southwestern Medical Center Waste Handling Facility *($25 fee)*

2:15-5:30 pm **Gold Room**

TPM-B Radioactive Waste - Past, Present and Future, Round Table

2:15 pm **TPM-B.1**

The Last 30 Years of LLRW Disposal

McCormick J

Bionomics

2:30 pm **Roundtable Discussion: Disposal Options**

3:15 pm **BREAK**

3:45 pm **TPM-B.2**

A View From the Chair: Perspectives and Lessons Learned from the Texas LLRWD Compact Commission

Ford M

Texas Low Level Radioactive Waste Disposal Compact Commission

4:00 pm **Roundtable Discussion: Policies/Regulatory/Licensing**

WEDNESDAY

7:00-8:00 am — Gold Room

CEL 5 Environmental Risk Assessment
Andrew H. Thatcher

7:00-8:00 am — International Ballroom

CEL6 Statistical Sampling and Analysis Approaches for Waste Disposal and Decommission Projects
Thomas L. Rucker, Dennis J. Beal
Science Applications International Corporation

8:45-9:45 am — International Ballroom

WAM-A Low Level Waste, and Disposal of Exempt Sources

Co-Chairs: Karen Barcal, Bob Wills

9:00 am — WAM-A.1
Status of the Texas Low Level Radioactive Waste Disposal Compact Commission
White JC
VA North Texas Health Care System

9:15 am — WAM-A.2
A Comparative Analysis of Internal Monitoring Programs at a Low-Level Radioactive Waste Facility
Kraus J, Shaw C, LaBone T
Waste Control Specialists LLC, MJW Corporation

9:30 am — WAM-A.3
Disposal of Smoke Detectors
Lolap GN, Lemon MR
University of Kansas

9:45 am — BREAK

10:15 am-12:15 pm — International Ballroom

WAM-B Contemporary Topics in Waste Management

Co-Chairs: Alex Lopez, Edward Selig

10:15 am — WAM-B.1
Characterization, Removal, and Disposal of the University of Iowa MC17 Cyclotron
*Hansen T, Gillenwalters E**
Ameriphysics, LLC

10:30 am — WAM-B.2
Feasibility of Clearance Concept for Daily Release of Small Amount of Solid Materials from Radiation Controlled Area
Ogino H, Hattori T
Central Research Institute of Electric Power Industry

10:45 am — WAM-B.3
Communication Strategies for Radiation Professionals
*Selig E, Glass A**
Center for Responsible Environmental Strategies

11:00 am — WAM-B.4
Estimation of Waste Volumes from Radiological Incidents
Boe TR, Lemieux PM, Rodgers MM, Peake RT, Schulteisz DJ, Ierardi M, Parrish CS
US Environmental Protection Agency, Eastern Research Group

11:15 am — WAM-B.5
Reduce Reuse Recycle, Electronic Waste Reduction
Gunter R
CHP Consultants

11:30 am — WAM-B.6
Transportation Challenges and the Security of Disused Sealed Sources: Progress and Prospects for Type-B Package Certification
Taplin T, Cuthbertson A, Martin D
National Nuclear Security Administration/MELE Associates, National Nuclear Security Administration/Office of Global Threat Reduction, National Nuclear Security Administration/Energetics Incorporated

11:45 am — WAM-B.7
Beta Dose Calibration of Thin Contact Colorimetric Dosimeters
*Abegaz S, Brodsky A**
Georgetown University

12:00 pm — WAM-B.8
Application of Soil Segregation Technology to Accurately Assay Concrete Material as a Means to Minimize Offsite Waste
Lopez AU, Lively JW
AMEC Environment and Infrastructure

12:15 pm — Meeting Adjourned

Continuing Education Lectures

CELs take place in the Fairmont Dallas

Monday, February 6 7:00-8:00 am

Gold Room

CEL1 ABHP Exam Fundamentals

Gus Potter; Patrick LaFrate

The process for achieving ABHP certification – beginning with the application submission through the completion of the examination to certification – will be presented. Tips for navigating certification throughout the process will be discussed. Topics will include qualifications and the application process, preparation of both exam parts, and keys to good performance. The material presented consolidates pertinent exam policy/procedure into an easily digestible format, offering real world examples of good and poor responses. Persons who are already certified may gain insight into the process and identify areas where they would be willing to assist in certification process. The presenters are current members of the ABHP board.

International Ballroom

CEL2 HPS Laboratory Accreditation Program Introduction to Uncertainty Calculations Part 1

Daniel VanDalsem

Eckert & Ziegler Isotope Products

The objective of this continuing education lecture is to familiarize HPS Laboratory Accreditation Program assessors and others with the requirements of the assessment program as they relate to radioactive source manufacturers/calibration laboratories. Because of the importance of uncertainty calculations in Laboratory Accreditation this course will concentrate on the corresponding technical issues involving laboratory quality assurance, the estimation of uncertainty, and limits of detection. An important element in the activities of health physicists who are responsible for the safety of personnel and the general public is the measurement of radiation from various sources, including reactors, radiation-generating machines and radioactive sources used in industry and in the medical diagnosis and treatment of patients. To be meaningful, these measurements must be performed using radioactive sources that are traceable to a national standards laboratory (e.g., NIST). Radioactive source manufacturers/calibration laboratories are accredited by the HPS LAP in accordance with the HPS Laboratory Accreditation Manual, ANSI/ISO/IEC 17025-2005 "General requirements for the competence of testing and calibration laboratories," and ANSI 42.22-1995 "Traceability of Radioactive Sources to the National Institute of Standards and Technology (NIST) and Associated Instrument Quality Control."

Tuesday, February 7 7:00-8:00 am

Gold Room

CEL3 The Psychology of Radioactive Waste Disposal

Ray Johnson

Radiation Safety Counseling Institute

Which is the greatest challenge for radioactive waste disposal: technical issues or people issues? While this HPS conference is mainly about technical issues; social issues, politics, and public perceptions of risks may pose the greatest challenges. Viable technical solutions to radioactive waste disposal have been available for many decades and yet the public seems to believe that we do not know what to do with such wastes. Public and political views often say the technical solutions for radioactive waste are not acceptable. Since acceptability seems to be more about risk perceptions than technology, perhaps we could benefit from better understanding of social issues. Health physicists have long been perplexed by the nature of public risk perceptions. Studies over that past two decades have begun to show how our minds work to protect us from perceived risks. Our subconscious minds create fear as a natural function for our protection. For survival we have learned to respond automatically to fears without conscious judgment. However, since radiation fears are based on imagined unacceptable consequences of exposure, they are not a true fear such as we might experience upon direct attack by an animal. Fears of radiation pervade all discussions of waste disposal like the invisible elephant in the room. Since radiation fears are from our subconscious, appeals to the conscious mind for rational decisions may not change a fearful person's feelings. The fearful imagination of the subconscious mind will win over rational intellect every time. Persons with subconscious fears will also distrust appeals for rational logical analysis by technical experts. Such persons will seek confirmation for their fears and discount anything which seems contrary to their beliefs. People's views of radiation risks will not change without a change in their subconscious minds. Marketers and psychologists know how to address the subconscious mind and their strategies will be reviewed.

International Ballroom

CEL4 HPS Laboratory Accreditation Program Introduction to Uncertainty Calculations Part 2

James Tarzia

Radiation Safety & Control Services

The objective of this continuing education lecture is to familiarize HPS Laboratory Accreditation Program assessors and others with the requirements of the assessment program as they relate to radiation instrument calibration laboratories. Because of the importance of uncertainty calculations in Laboratory Accreditation this course will concentrate on the corresponding technical issues involving laboratory quality assurance, the estimation of uncertainty, and limits of detection. An important element in the activities of health physicists who are responsible for the safety of personnel and the general public is the measurement of radiation from various sources, including reactors, radiation-generating machines and radioactive sources used in industry and in the medical diagnosis and treatment of patients. To be meaningful, these measurements must be performed using radiation instruments whose calibrations are traceable to a national standards laboratory (e.g., NIST). Radiation instrument calibration laboratories are accredited by the HPS LAP in accordance with the HPS Laboratory Accreditation Manual and ANSI/ISO/IEC 17025-2005 "General requirements for the competence of testing and calibration laboratories."

Wednesday, February 8 7:00-8:00 am

Gold Room

CEL5 Environmental Risk Assessment

Andrew H. Thatcher

A common theme in evaluating contaminated sites regardless of the origin or type of radioactive contamination is a risk assessment developed to fully evaluate the potential impact of the contamination to surrounding environs and future residents. In order to accomplish this objective in a one hour window we'll walk through the environmental transport and pathway analysis for a low level radioactive waste facility and address the topics related to fully completing the analysis from start to finish. Topics will include:

* Site characterization and evaluation

* Development of scenarios to include solicitation of input from interested parties and applicable regulatory drivers

* Selection of environmental pathways for evaluation based upon the exposure scenarios and the location.

* Selection of input parameters and obtaining site specific data where needed.

* Performing sensitivity analysis and evaluating uncertainty for complex sites

* Validation of the model used with actual data where possible

* Presentation of results on a deterministic or probabilistic basis.

This basic model for risk assessment has been applied by the presenter to a number of contaminated sites over the years. This course is for participants interested in obtaining a greater background and details on performance assessments and the legwork involved in various aspects of the process.

International Ballroom

CEL6 Statistical Sampling and Analysis Approaches for Waste Disposal and Decommission Projects

Thomas L. Rucker, Dennis J. Beal

Science Applications International Corporation

It has been said that you can prove anything with statistics. However, the "proof is in the pudding" and valid proofs depend on valid application of statistical principles and assumptions. The use of MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual) guidance and it's supplement MARSAME (Multi-Agency Radiation Survey and Assessment of Material and Equipment Manual) have provided a statistical framework for sampling and analysis of characterization data for both site decommissioning and waste management projects based on a standard data life cycle and on meeting developed data quality objectives. However, statistical assumptions are often not verified to be applicable to the material in question. Furthermore, misunderstanding of how to apply statistical principles and methods to radiological data can lead to erroneous conclusions. Some examples of misapplication of statistics includes poor assumptions relative to the grouping of material into homogenous populations for statistical sampling based on poor or missing historical process knowledge or scoping data; poor or unverified assumptions relative to the relationship between surface and volumetric contamination; poor assumptions relative to population distribution shapes; and, improper application of statistical methods for "undetected" versus "detected" data. Some available statistical packages lend themselves to misapplication in these ways, especially for the unwary and uninitiated. Examples from some actual site decommissioning and waste management projects using various statistical methods and available statistical software packages will demonstrate the misapplication and proper application of statistical principles.

Abstracts

MAM-A.1 Texas: The Path and Policy to Radioactive Waste Disposal

Jablonski S, Texas Commission on Environmental Quality

This presentation will focus on the challenges and lessons learned in approaching the management and disposal of commercial low-level radioactive waste in the Texas Compact. The State of Texas has actively worked decades to address radioactive waste management and disposal issues. The current strides made in Texas on the radioactive waste management front have come from unique attributes that help support a public policy foundation. The openness and transparency of the process is essential to maintain stakeholder acceptance over the time frames necessary to complete siting, licensing, constructing, and operation of a radioactive disposal facility.

The public policy of radioactive waste management, specifically low-level radioactive waste disposal, has been evolving in Texas for more than twenty years. The policy today is a product of past events and lessons learned. In many ways, public policy on radioactive waste disposal has come full circle. Radioactive waste management public policy does not solely rely on technical expertise or state of the best technology. Sound science is simply not enough. Innovation in this case is largely people-based, focused on new ways to communicate risk and new opportunities to deliver a message of safe and effective radioactive waste management.

MAM-A.2 An Update on the Texas Compact Low-Level Radioactive Waste Disposal Facility

Baltzer R, Waste Control Specialists LLC

Waste Control Specialists LLC ("WCS") obtained a license from TCEQ in 2009 to dispose of Class A, B & C low-level radioactive waste from both the Texas Compact and the federal government at their facility in western Andrews County. WCS will be the first Interstate Compact low-level radioactive waste disposal facility to be licensed and operated under the Low-level Waste Policy Act of 1980, as amended in 1985.

Construction for the new facilities started in January 2011. The Texas Compact facility is complete and is expected to be available for disposal operations at

any time. The Federal facility is expected to be complete in February 2012 and ready for disposal operations in the spring of 2012.

An overview of WCS' facilities, capabilities, timelines, geology and other relevant topics will be included in the presentation.

MAM-A.3 Radioactive Waste - Past, Present and Future Policies and Regulatory Issues
Magette T, EnergySolutions

MAM-A.4 A Perspective on Waste and Fuel Cycle Issues in a Post Fukushima World
Magwood WD, US Nuclear Regulatory Commissioner

MAM-A.5 Radioactive Waste Management: Where Do We Go from Here?
Jacobi R, Jacobi Consulting

MPM-B.1 Prevention of Unauthorized Disposal of Radioactive Material in Solid Waste and Scrap Recycling Facilities: Role of State Radiation Control Programs and Resources Available
McBurney RE, Meyer CR; CRCPD; rmcburney@crcpd.org

State radiation control agencies not only regulate the use of sources of radiation, including radioactive material in Agreement States, but also play a key role in preventing unauthorized disposal and recycling of radioactive material at solid waste and scrap recycling facilities. Through the Conference of Radiation Control Program Directors (CRCPD), several resources that provide assistance to both facility operators and regulatory programs have been developed and/or made available to deal with discovered radioactive material. These include standard response and event notification protocols, including training, for use by state agencies and industries when radiation monitors detect unexpected radioactivity and non-licensed facilities; guidance and best practice information for facilities that monitor for unwanted radioactive material; and lists of brokers and other service providers that can be used to deal with the material if the original owner cannot be identified. CRCPD also holds two special permits with the U.S. Department of Transportation. These special permits may be used by states registered with CRCPD to authorize one-way shipments of scrap metal or solid waste. When an un-placarded conveyance is identified as containing radioactive material, a state official, registered under the special permit, can authorize the otherwise potentially non-compliant shipment to be transported to a location more appropriate for characterization and disposition. This presentation describes the contingency activities and resources available for dealing with discovered radioactive material in these situations.

MPM-B.2 The Psychology of Radioactive Waste Disposal
Johnson R; Radiation Safety Counseling Institute, Dade Moeller; ray@radiationcounseling.org

What is the greatest challenge for radioactive waste disposal, technical issues or people issues? Why do regulators and the public demand such extraordinary practices for disposal of radioactive wastes? Why does the public seem to mistrust politicians, regulators, industry, and experts regarding such waste disposal? The answer to each of these questions has to do with fears of radiation. These fears arise from images or imagination of unacceptable consequences of exposure to radiation. The subconscious mind of a fearful person will create the most alarming images in order to assure protection of the person. People who are fearful of radiation are not aware of these images which originate in the subconscious mind. They just know instinctively that radiation exposure is bad. Appeals to the conscious mind for rational decisions about safety will not change the fearful person's feelings because their fears are from their subconscious mind. The imagination of the subconscious mind will win over the rational conscious mind every time. A person with subconscious fears will also seek confirmation and thus will be very open to information about alarming risks as promoted by the media and anti-nuclear activists. Information provided by radiation experts, which is contrary to the expectations of the subconscious mind of a fearful person, may be viewed with great suspicion and discounted. Fearful people will also gravitate towards others expressing the same fears for reinforcement of their fears. People reacting to their subconscious fears may rationalize their perceptions with arguments that make no sense for logical, rational, analysis by the conscious mind and understanding by technical experts. People's views of radiation risks will not change without a change in their subconscious minds. Marketers and psychologists know how to address the subconscious mind.

MPM-B.3 Sealed Source Security and Commercial Disposition: Progress, Prospects, and the Path Ahead

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Radioactive sealed sources used in industry and medicine have been improving and saving lives for over half a century. They are compact, encapsulated, and safe to handle. However, these same qualities make them attractive targets for terrorists planning a radiological dispersal device (RDD) attack. Disused sealed sources relegated to storage because of the lack of commercial disposal options therefore present a national security concern, as described in the 2010 interagency Radiation Source Protection and Security Task Force Report chaired by the Nuclear Regulatory Commission (NRC) and the 2009/2010 publications of the public-private Removal and Disposition of Disused Sources Focus Group created through the Department of Homeland Security's Critical Infrastructure Protection Advisory Council. Fortunately, several promising regulatory and policy developments this year may increase disposition options for these sources. These developments include the potential expansion of disposal at new and/or existing commercial facilities for beta/gamma emitting sources; revision of the NRC's Branch Technical Position on concentration averaging; and the potential to dispose of foreign-origin transuranic sealed sources with similar domestic sources. Furthermore, the Low-Level Radioactive Waste (LLW) Forum has created a Disused Source Working Group under its Board of Directors. Over a 12 to 18-month term, the Working Group will consider issues related to the management of sealed sources, using a holistic approach that considers both the front-end (use) and back-end (disposition) of sealed sources. The working group will produce a final report to be delivered to the LLW Forum's Board of Directors and the National Nuclear Security Administration that may include, among other things, a problem statement, explanation of issues, and recommendations for a path forward.

MPM-B.4 Technical and Policy Approaches to Managing Waste from Radiological Incidents

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The National Response Framework designates the United States Environmental Protection Agency (EPA) as the lead agency to coordinate, integrate, and manage the overall Federal effort to clean up and dispose of waste resulting from a radiological incident. Exercises such as Liberty RadEx, held in Philadelphia in April 2010, have highlighted the challenges of responding to such incidents in highly-populated urban environments. EPA estimates of waste volumes resulting from such an incident suggest that existing disposal capacity for low-level radioactive waste will be severely taxed, if not exceeded. Waste volumes will be affected by decisions related to decontamination methods and clean up levels. A significant proportion of waste is likely to be relatively low in radionuclide content, suggesting that it may be amenable to alternative disposal methods. EPA has studied the problem of disposal of radionuclides in hazardous waste landfills for the purpose of evaluating the appropriateness of such disposal options. In addition, EPA is developing a tool to generate first-order estimates of waste volumes resulting from a radiological incident, which can be used to evaluate the implications of different response actions. Policy aspects of waste management decision making are also being examined. This paper summarizes these efforts.

MPM-B.5 Health Physics Society Positions on Waste Disposal

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As part it its government and public affairs programs, the Health Physics Society maintains positions on the management of spent nuclear fuel and low-level radioactive waste and has published position statements that expand upon both positions. These positions and position statements have been used on several occasions as the basis for written comments to and discussions with regulators. This paper will review the (1) process used by HPS to create positions and position statements, (2) main points of these two subject position statements and (3) comments submitted to regulators, which address waste management issues. It will also comment on recent discussions between the HPS President(s) and regulators and on the reactions of regulators to these positions. During discussions

with the HPS President(s), regulators have expressed appreciation for the open dialogue and their respect for HPS as a stakeholder.

MPM-C.1 Low Activity Waste: Navigating a Pathway for Disposal

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Since the days of the U.S. Nuclear Regulatory Commission's policy on materials that are 'Below Regulatory Concern' and through the U.S. Environmental Protection Agency's Low Activity Radioactive Waste rulemaking efforts, as well as the U.S. Nuclear Regulatory Commission's Clearance of Solid Materials rulemaking efforts, radioactive material licensees have waited in vain for codified limits below which materials do not need regulation or special disposal. By looking at the history of the efforts to accomplish this, we can derive lessons for future rulemakings. This presentation discusses the past efforts to codify clearance limits, the public and political reactions to those efforts, and suggests a path forward for future efforts.

MPM-C.2 Health Effects from Exposure to Natural and Depleted Uranium

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During the last nearly 2 decades, the use of depleted uranium on the battlefields of Iraq and other countries has stimulated interest in researching and understanding its health effects. Such use provides exposure opportunities for service members while in the area and the public for the forseeable future. The Agency for Toxic Substances and Disease Registry published a Toxicological Profile for Uranium in 1999 that produced the first health guidance values in this country to address both inhaled or ingested uranium based on solubility. This year, ATSDR is scheduled to publish an update to that document. The current draft is the Agency's official document, and it addresses the interim literature, features depleted uranium studies in war veterans and populations near the battlefield, deeply probes the ability of uranium to produce health effects, and presents revised health guidance values that utilize the newest benchmark dose methodology endorsed by the Environmental Protection Agency. The document has been peer reviewed and revised accordingly, and comments from the subsequent public comment period are being addressed. This presentation is on the currently understood health effects associated with exposure to natural and depleted uranium, with a focus on exposure-related neurological, reproductive, developmental, renal, and cancer effects.

MPM-C.3 Activities of the Southeast Compact Commission for Low-level Radioactive Waste Management

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When Congress passed the Low-Level Radioactive Waste Policy Act in 1980, it assigned each state responsibility for the disposal of low-level radioactive waste generated within its borders, and encouraged states to enter into regional compacts to share that responsibility. To meet their obligations under the Act, Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee and Virginia formed the Southeast Interstate Low-Level Radioactive Waste Management Compact in 1983. The number of states in the Compact changed to six with the withdrawal of South Carolina in 1995 and North Carolina in 1999. In 1999, the Compact Commission placed sanctions against the State of North Carolina and later brought suit against North Carolina for failure to site a low-level radioactive waste site within its borders. In June of 2010, the U.S. Supreme Court ruled in favor of North Carolina, and in December of 2010, the parties agreed to have the suit dismissed by the Supreme Court. This presentation will briefly cover strategic decisions made by the Southeast Compact Commission since the U.S. Supreme Court decision, its primary goals, and the future of Compact activities in our region.

MPM-C.4 The Source Collection and Threat Reduction Program: What It Is, Where It Is, Where It Will Be

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The Source Collection and Threat Reduction Program (SCATR) occupies a small niche in the Off-Site Recovery Program (OSRP) as part of the National Nuclear Security Agency's (NNSA) Global Threat Reduction Initiative (GTRI). The SCATR program's mission is to encourage and facilitate the disposal of sealed or discrete unwanted sources of radioactive material in those states that have access to a commercial low-level radioactive waste disposal site. Emphasis is placed on sources that are less than category 2, as classified by the IAEA, and which contain sufficient activity, to pose a threat if aggregated. The SCATR program is administered by the Conference of Radiation Control Program Directors through a coopera-

tive agreement with OSRP. The service provided by SCATR is the organization of collections of sources in the candidates' state or area, the selection of a broker, and financial assistance as necessary to individual participants. The SCATR program's initial project was a pilot study in 2007. The purpose of the project was to collect as many sources as possible from Florida for disposal at Barnwell prior to its closure to out-of-compact waste. The State of Florida radiation control staff assisted by providing facilities and manpower. The pilot was a success and a number of valuable lessons were learned as well. As a result a different approach was adopted for the program. SCATR is continuing to have success in providing its services. Six additional collections have been organized since the Florida collection. Events may soon develop which will allow disposal options to states without access to low-level waste compact facilities. OSRP and the CRCPD are looking forward to providing SCATR services to those states.

TAM-A.1 Challenges in Managing College Radwaste Projects

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As contract RSO to a local college, we had the dubious task of overseeing a declining college radiation safety program without having adequate administrative support or funding. For at least 10 years administration had been unwilling to support anything but bare minimum health and safety program (10 hrs/mo). A state inspection initiated program changes, with administration agreeing to funding and support. Our prospectus to remediate inspection findings included decommissioning of facilities and disposal of unwanted sources and materials. More than a dozen unused sealed sources were shipped, mixed waste was stabilized, decay-in-storage waste, which included sharps, was repackaged and discarded, and current user waste was inventoried. The project took about 3 months, resulting in the disposal of 95% of materials. Outcomes included increased user awareness of safety procedures for loose waste (DIS) and a streamlined safety program with full administration support.

TAM-A.2 Design and Relocation of a Research University's Low-Level Radioactive Waste Storage Facility

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Georgia Tech's Office of Radiological Safety (ORS), which provides radiation safety services to Georgia Tech's faculty, staff, and students, recently moved their offices, labs, and waste storage facility to a new location. The decision was made in 2008 to move the Nuclear & Radiological Engineering Department and ORS offices and labs to the Boggs building. Various options, each with its own drawbacks, were offered, and a room in the Boggs building was selected. ORS staff compiled a list of functions to take place in the new facility and the items to be located there, and laid out the floor plan accordingly. Rooms bordering the facility were also taken into consideration during the planning process. Some of the challenges encountered during the construction process included learning enough construction terminology to understand the architects and contractors, reading construction drawings, and maintaining communication between the 3 ORS staff members who rotated attendance at the weekly construction meetings. As the new facility neared completion, waste preparation began. Decay-in-storage (DIS) waste was processed, eligible waste was poured down a hot sink, and a large waste pickup was scheduled to further minimize the waste to be relocated. After a final construction walk-through and subsequent fixes, the fixtures and heavy cabinetry were relocated by professional movers. The waste itself was moved by ORS personnel to the new facility. We learned a great deal that can be applied to other construction projects we are involved in, including the importance of attending every meeting, understanding and following up on construction details, keeping up with the ever-changing timetable, and carefully examining all 'cost engineering' changes suggested by the contractors, some which could compromise the safety or security of the facility.

TAM-A.4 Thermal Characteristics and Radiotoxicity Analysis of the Advanced PWR Spent Fuels for Safe Storage Management Plan

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Management of nuclear waste is one of the major challenges for sustainable use of nuclear power. The main issues with the waste include the decay heat and the radiotoxicity of the waste. The issue of spent fuel management has come to the forefront of public debate in the aftermath of the recent Fukushima incident. There have been numerous studies involving thermal analysis on the spent nuclear fuel; however, post Fukushima the Nuclear Regulatory Commission (NRC) is re-evaluating the spent fuel storage facilities in US.

This work involves providing data for thermal and radiotoxicity of spent fuel using the ORIGEN-S isotope generation and depletion code. The code considers decay heat for (1) pulse fission irradiations for many fissionable materials in spent fuel for cooling times of interest to severe accident analyses (< 105 s), and for (2) full-length fuel assemblies over longer cooling times of importance to spent fuel storage and transportation. The most recent nuclear data libraries were used and the results were compared for various burn up and subsequent cooling time range. The radiotoxicity analysis was also performed using the MCNP code to validate ORIGEN-S results. The details of using ORIGEN-S computer code for predictions and calculation of decay heat for fuels compatible to the next generation nuclear plant is presented. The focus of the research effort is to train students in fuel cycle management research which is expected to address issues related to proliferation resistance, waste management, and security of sustainable use of nuclear power.

TAM-A.5 Nuclear Medicine Research and Development Waste Management

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Waste generated during research and development of radiolabeled pharmaceuticals in a cancer research institution is effectively managed through intimate knowledge of the research program, knowledge of the radionuclide production process and effective use of instrumentation with the goal of optimizing available storage space. A comprehensive program employing a local cyclotron to supply short-lived isotopes for imaging introduces long-lived impurities with the imaging isotopes and introduces a variety of physical forms in the waste stream. The Health Physicist managing the radioactive waste must be familiar with many aspects of the research program to anticipate the forms of waste that may be encountered. For example, biological models require special storage and disposal considerations, which are complicated by the presence of long-lived impurities. The possibility of long-lived impurities in all forms of waste complicates both planning and management. Because the physical characteristics of the isotope are critical to determining whether the waste can be stored for decay or shipped for disposal and how long the waste must be stored for decay, knowledge of the radionuclide production process along with analysis instrumentation are essential to manage waste containing long-lived impurities. Next to knowledge of the radionuclide production process, gamma spectroscopy is indispensable in the identification of long-lived impurities. Additional instrumentation stipulations in the presence of long-lived impurities include sensitive waste monitors at facility exitpoints. Thoroughly understanding many aspects of the research program allows a finite amount of waste storage space to, within the limitations of radioactive material license conditions, accommodate all waste forms in the presence of long-lived impurities while accommodating the anticipated volume of waste to be stored for decay.

TAM-A.6 Unique Challenges and Lessons Learned from Management of Unconventional Waste at Old Universities

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Unconventional waste stream such as damaged tritium exit signs, old circuit breakers with polonium and mixed waste of laboratory chemical and Naturally Occurring Radioactive Material (NORM) are prevalent at old research university buildings. Although they may present no major regulatory implications due to the low radioactivity in some, the serious financial obligations with management and disposal of these waste stream present a concern. Drawing upon its experience with decommissioning of an old research building, the University of Houston has implemented proactive management initiatives to minimize business risk and future disposal cost of unconventional waste stream. Lessons learned and the current approach to managing such wastes will be shared in this presentation.

TAM-B.1 Decontamination Alternatives in Decommissioning Projects

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The current surface contamination limits used for release of facilities for unrestricted use can be applied in decommissioning projects to verify acceptable levels of removable contamination or residual contamination that pose minimal health risk to the general public. However, the amount of residual radioactivity remaining in a facility should be taken in context of what the structure or surface is to be used for in the future. Risks associated with various levels of residual surface contamination can be correlated with accepted risk based standards. These risks are associated with the remaining potential exposure from the radioactive material in the context of demolition and disposal as industrial rubble or solid waste being the final path. The cost of verification that a facility meets

the surface contamination levels can be very significant if there is a lot of surface area to survey. Current regulatory guidance prescribes detailed methodology to accurately determine the residual radioactivity of a facility. The level of detail required if demolition is the final option may be less and present less of a risk to the occupational worker and the public. This methodology presents tremendous savings in labor and disposal costs. With a few simplifying assumptions the risk associated with leaving the radioactive materials in place may be determined. This paper will deal with those assumptions and how to translate them into an acceptable risk scenario. The methodology used to incorporate these assumptions into a format that is acceptable to the regulators will be reviewed in a general form because regulatory responses differ widely. The intent is to present an alternative to expensive decontamination when alternate steps are available.

TAM-B.2 Savannah River Site Composite Analysis Monitoring Plan

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The Savannah River Site has completed a Composite Analysis per DOE Order 435.1 (Radioactive Waste Management) to estimate the effects on future members of the public from radioactivity that may remain after US Department of Energy operations cease. A Composite Analysis is viewed as a planning tool relative to the site's end state radiological protection of the public and not as a tool to evaluate current or near term compliance, which is done in the site's Annual Environmental Report per DOE Order 458.1 (Radiation Protection of the Public and Environment). A Composite Analysis monitoring plan must be implemented within one year of issuance of the Composite Analysis and updated at least every five years. The Savannah River Site Composite Analysis monitoring plan is described in this presentation. It includes annual data review and evaluations and relies heavily on existing sampling and analysis performed for the site's Annual Environmental Report. The total annual release of each radionuclide to each stream will be determined from these data. In-stream concentrations, for input to the Composite Analysis dose module, will be calculated using average annual stream and river flow rates. In lieu of effluent measurements, annual Cs-137 fish concentration data from fish caught at the mouth of each stream will be utilized. Due to bioaccumulation, the Cs-137 in fish is easier to measure and is considered to more closely represent end state conditions, even though it may be an over-estimate since the impact of Cs-137 effluent discharges cannot be separated out of the fish data. The resulting doses from the modified Composite Analysis dose module are compared to the existing doses results for that respective year and to the Annual Environmental Report doses. Beginning with the 2011 Annual Environmental Report, a new data table will be added that will itemize the site's radiological liquid releases by stream to facilitate processing of the Composite Analysis monitoring results.

TAM-B.3 Implementation of Multi-Agency Radiological Laboratory Analytical Protocols (MARLAP) in Environmental Monitoring Programs at a Low-Level Waste Facility

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The implementation of MARLAP principles at a Low-Level Radioactive Waste disposal site for a Radiological Environmental Monitoring Program (REMP) has been described in limited detail. The site is operated by Waste Control Specialists LLC and is located in Andrews County, Texas near the Texas/New Mexico Border. The primary goal of the environmental monitoring program is early detection of a contaminant release and determining the magnitude of such a release. The MARLAP process provided a flexible and scientifically rigorous approach to obtaining and producing laboratory data as well as assessing if the data are of sufficient quality for making decisions and taking action.This presentation briefly covers the development of this program under the guidance of the MARLAP.

TAM-B.4 RACER: A Data Analysis Tool Used to Evaluate Potential Environmental Impacts at a New Low-Level Radioactive Waste Disposal Facility

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Waste Control Specialists LLC (WCS) has implemented the RACER Data Analysis Tool (RACER DAT) at its newly developed site that will be used for the disposal of Class A, B and C Low-Level Radioactive Waste (including Class A, B and C Mixed Waste). The opening of this facility marks a tremendous success in radioactive waste management as it is the first such facility developed under the Low-Level Radioactive Waste Policy Act of 1980, as amended in 1985. Once operational, this facility will serve both the

Texas Compact and the U.S. Department of Energy. The success of licensing this facility was achieved not only due to its unique geological characteristics and robust site design, but also by the tremendous support provided by the Texas legislature, as well as regional and local communities of the Permian Basin of western Texas and southeastern New Mexico. The community support that contributed to this success cannot be overstated or ever compromised. The local community must rest assured that the environmental monitoring program established at this facility is state-of-the art and fully capable of providing early warnings of any potential releases of radioactivity or hazardous chemicals that could adversely affect public health. WCS selected to implement RACER DAT because it has been proven successful in providing a transparent and scientifically-based approach to evaluate the environmental and human health impacts from the 2000 Cerro Grande fires near Los Alamos, New Mexico. It currently contains over 8 million analytical results that are shared between Los Alamos National Laboratory and the New Mexico Environment Department Oversight Bureau—features which are needed for implementation at WCS. This presentation will address many of the attributes of RACER DAT that were considered essential to better organize and manage the environmental data that has been collected over the past several years at WCS. It will also address the important role that this tool will have in establishing a transparent process needed to inform the Texas Commission on Environmental Quality, as well as other stakeholders, regarding the environmental performance of the first radioactive waste disposal facility developed over the past 40 years in the United States.

TAM-B.5 Performance Assessment for Delaying Installation of an Infiltration Reducing Cover at the Low Level Radioactive Waste Site in Richland Washington in Support of the Final Environmental Impact Statement

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The low-level radioactive waste (LLRW) disposal site in Richland, Washington has undergone both a Draft and a Final Environmental Impact Statement (FEIS). One of the decisions made in the FEIS was to immediately begin installing a low permeability cover over the closed trenches in order to reduce future ground water-related dose. Due to continued site investigations, cover installation was delayed. The goal of the current analysis is twofold: to analyze the impact of the delay and determine when the increased infiltration rates from a lack of cover will result in exceeding onsite and offsite dose limits; the second goal is to analyze some of the limitations in the original analysis identified by the Nuclear Regulatory Commission in their review of the FEIS. This paper will present the findings of the current analysis as well as outline the possible impacts of localized higher activity trenches as compared to a homogenized waste site; more detailed modeling on the impacts of lateral contaminant flow, and measurement of the radon diffusion through backfilled site soils.

TAM-B.6 Improving Radwaste Soil Estimates with Gamma Logs

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A depth measurement survey system (DMSS) was developed and deployed for the purpose of improving estimates of the volume of soils at uranium in-situ recovery (ISR) wellfields that are contaminated with radioactive materials in concentrations above the release criteria for unrestricted use. The systematic methods used may benefit estimates of the above criteria soil volumes at any site where anthropogenic gamma emitting radioactive materials are distributed below the upper 0.15 m layer of soil. The DMSS uses a shielded side-looking gamma detector to produce gamma logs of the near-surface soil layers for direct comparison to the release criteria. The resulting depth profiles plots show the subsurface gamma levels as a function of depth below the ground surface. When combined with the areal extent of the above criteria soils in the near-surface areas identified by GPS-based near-surface scanning surveys, the DMSS depth profile results can improve the accuracy of estimates for the volume of soil that is above the release criteria for unrestricted use. The DMSS methods used will be described and examples from the 110 DMS locations surveyed at two uranium ISR sites will be presented.

TAM-B.7 Updating a Deterministic Modeling Design From RESRAD to GoldSim: Examining a Highly Engineered Low-Level Waste Disposal Facility

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On September 10, 2009, the Texas Commission on Environmental Quality issued a radioactive material license to Waste Control Specialists LLC authorizing, with conditions, the construction of a new facility

authorized to dispose of Class A, B and C Low-Level Radioactive Waste in Andrews County, Texas. The licensing, construction and opening of this facility is the first to be developed under the Low-Level Radioactive Waste Policy Act of 1980, as amended in 1985. One of the most challenging tasks of licensing this facility was preparing a Performance Assessment (PA) that addressed the potential impacts to human health and the environment not only during operations, but for tens-of-thousands of years after the 100-year institutional control period had expired. The updated PA's primary focus is directed towards efforts recently undertaken to update the original PA that was developed in support of the initial licensing of the waste disposal facility. The purpose of preparing the updated PA was not only to comply with specific license conditions, but also to incorporate new site geological and geophysical characterization data, as well as revised distribution or partitioning coefficients (Kd). Of particular interest were the leach rates and numerical Kd values established not only for soils, but also present in the waste-matrix interfaces (e.g., radiocarbon bounded with irradiated metals and effects of concrete on mobile radionuclides). Other significant challenges encountered during the development of the updated PA included addressing future climate changes and capturing the peak radiation doses for the period of performance (1,000 years into the future or peak dose whichever is longest) as required under the regulations promulgated in Texas. While many of the baseline assumptions supporting the initial license were incorporated in the updated PA, new probabilistic fate and transport codes, such as GoldSim, HYDRUS, and Modflow-Surfact were employed to demonstrate compliance with the performance objectives codified in the regulations established in Texas. In a comparison between the results of the updated PA against the one developed in support of the initial license, both clearly demonstrated the robustness of the characteristics of the site's geology and engineering design of the disposal units. Based on the simulations from fate and transport models, the radiation doses to members of the general public predicted in the initial and updated PAs were a fraction of the performance objective of 25 millirem year-1 (0.25 millisievert year-1).

TAM-B.8 Discovery of Unexpected Waste Stream Radionuclide of Concern

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The data quality objectives (DQOs), cost, and schedule basis for radiological remediation projects are based on site, process, and previous investigation knowledge. This knowledge is documented in a historical site assessment (HSA) that includes a conceptual site model (CSM). Radionuclides of concern (ROCs) and release criteria are determined during survey design using the DQO process based on the HSA and CSM. Discovery of additional radionuclide contaminant(s) during remediation potentially requires survey design changes and poses issues that can impact project goals including, health and safety, remedial action support, waste disposal, final status surveys, cost, and schedule. This presentation discusses a case study of issues and successful solutions resulting from non-invasive investigation and identification of transuranic waste (plutonium 239) as an additional ROC during remediation of research laboratory waste trenches at a Department of Defense project site. Project waste was removed and disposed, and the site approved for unrestricted use by the USNRC and Air Force Radioisotopes Committee based on the remediation performed, revised DQOs, and FSS results.

TPM-A.1 The Waste Isolation Pilot Plant-Update on Operational Performance

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This presentation will give an overview of performance metrics associated with the WIPP site. The presentation will cover transportation, engineering, safety, throughput and mining. This presentation will also include a video tour of the WIPP site operations along with a short review of some cutting edge physics research currently underway in the WIPP underground.

TPM-A.2 Comparing Defense TRU Waste Disposal Costs at WIPP with Class C Low-Level Waste Disposal Costs at Waste Control Specialists

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The Texas Council on Environmental Quality TCEQ) recently set the base disposal rates that Waste Control Specialists (WCS) may charge for disposal of LLW at their Andrews Texas facility, including the cost basis for Class C wastes. For many years, there has not been a disposal option for Class C wastes, so a cost comparison between this category and disposal of TRU waste at WIPP was not possible. This work attempts to now provide this cost comparison when only disposal costs are considered. Disposal costs include all surcharges for specific waste characterisitcs applicable to the WIPP waste.

TPM-A.3 Use of Health Physics at the Waste Isolation Pilot Plant (WIPP)

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The WIPP site has long enjoyed a solid commitment to science based approaches to operations and design. Recent developments include a new light weight facility cask, a new transportation capability (TRUPACT-III) and methods for mitigating radon interference in measurements. A review of these developments will be given outlining the need for these changes and how WIPP successfully utilized good engineering design through scientific methods to obtain operationally demonstrated solutions to the same.

TPM-A.4 Use of a Portable HPGe for Counting Smears and Air Filters

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Basic measurements to characterize the utility of using a commercial portable HPGe spectrometer for counting air filters and smears were made. The intended application is identification of Am241. In addition to efficiency, measurements included signal to noise and time to alarm requirements. Recommendations and limitations for operational use are presented.

TPM-B.1 The Last 30 Years of LLRW Disposal

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Over the past 30 years the low level radioactive waste disposal industry has gone through a number of changes. In the 1980's three disposal sites were in existence and after the Compact legislation waste disposal prices began to rise and disposal started shifting to volume reduction. In the 90's processing facilities were at their peak. After 2000 the waste volumes at the point of generation steadily decreased and technologies such as incineration and Supercompaction have further reduced volumes sent to the disposal sites. Some technologies have proven to be too expensive and there have been companies that have failed. Existing Processing and Disposal facilities offer a number of options for reducing volumes and costs, while the future will bring about a new disposal site in Texas and new waste treatment options. This talk is based on the experiences of someone who has serviced research facilities and universities for the past 30 years and deals with waste processing and disposal sites on a routine basis.

TPM-B.2 A View from the Chair: Perspectives and Lessons Learned from the Texas LLRWD Compact Commission

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During the first three years of operation of the Texas Compact Commission, significant growing pains were experienced and numerous lessons were learned. The Commission's initial work was largely focused on matters of funding and basic operational necessities (e.g. pens, paper, etc.). With a sometime-volunteer/sometime-paid executive director graciously stepping in to keep things operating on a somewhat smooth basis, the Compact Commission set out to engage generators, processors, the Compact Disposal Facility and the public in the formation of the initial rules governing the process of exporting and importing. Contrary to the facts of a long-established federal compact law authorizing the Compact Commission to engage in decisions over matters of export and import for both processing and disposal, the public relations battle raged over the Compact Commission's decision to 'make Texas the national dumping ground' of the United States. It is rightly pointed out that Texas intentionally sought out two of the smallest states in the nation (Maine and Vermont), to join in a Compact to minimize the impact of any waste importation that might occur in the state and to limit commerce from other sources. So what precipitated the change to emphasize the need for imported waste at the Compact Disposal Facility? That question is answered in detail by taking a long look at the license conditions and the costs incurred in complying with those conditions. This presentation will also review legislative changes flowing from the recently concluded Texas legislative session that passed two significant pieces of legislation regarding the Texas Compact with overwhelming majorities. The changing landscape of waste processing and NRC regulatory changes will also be reviewed with regard to their effects on the Texas Compact.

WAM-A.1 Status of the Texas Low Level Radioactive Waste Disposal Compact Commission

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The current status of the Texas Low Level Radioactive Waste Disposal Compact Commission is discussed. Areas of focus are the current makeup of the Commission, the funding of Commission operations, personnel working for the Commission, laws and other State requirements for Commission operations, poten-

tial Compact members, Rules for Import and Export, and other Commission operational aspects. Projected dates for actions of the Commission are given, and links to Commission tools are provided. A summary of Commission milestones are given, including Rules, funding, legal challenges, and waste procedures. Areas of current effort are described, and contact information is provided. Problems of operating an Interstate Commerce Commission in a Host State environment are described, and solutions to those problems in this case are described.

WAM-A.2 A Comparative Analysis of Internal Monitoring Programs at a Low-Level Radioactive Waste Facility

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With a potential array of radionuclides that span across broad energies and decay types, internal monitoring programs established for a low-level radioactive waste site must allow for a high degree of detection for all types of radiation. The facility monitoring program currently uses a combination of in vivo and in vitro sampling, with sampling frequencies and nuclides of concern based on radioactive material license conditions. This sampling occurs in addition to standard workplace air monitoring. A proposed internal monitoring program would increase the amount of air sampling performed, relying heavily on personal air samplers for monitoring the worker's breathing zone and assigning dose. Through administrative controls, the workers are required to wear a personal air sampler when entering any radiological contamination or airborne areas. Bioassay methods specific to the waste handled are used to confirm the personal air sampler results and the effectiveness of the respiratory protection program. Data on the proposed internal monitoring program will be compared to the current program. Limits of detection and differences between the programs will also be discussed.

WAM-A.3 Disposal of Smoke Detectors

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The Radiation Safety Office is responsible for risk assessment and management and prudent practice for sources and exposures to radiation. Ionization smoke detectors that have been replaced in older campus buildings are received by the university radiation safety program. Experience with managing the prudent disposal of smoke detectors containing Am-241 and Ra-226 sources is presented. General license requirements are considered and contrasted with the requirements of a Type A Specific License of Broad Scope. A variety of disposal and/or return options are summarized. Keeping in compliance with prudent practice and applicable regulations, the Radiation Safety Office needs to evaluate these options to select the most appropriate method, when dealing with several hundred detectors. Health physics concerns include choice of most appropriate disposal option, review of general license to not only manufacture and distribute but also to accept return of sources, authorization for source removal, receipt of and final disposal processing confirmation. Administrative constrains of return and payment procedures, shipment and package requirements, documentation and costs involved also need due consideration. This presentation briefly highlights the variety of smoke detector advances.

WAM-B.1 Characterization, Removal, and Disposal of the University of Iowa MC17 Cyclotron

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A number of pharmaceutical producing cyclotrons are reaching the end of their useful lives. Removal and dispositioning of these machines requires considerable, up front planning because they are large, usually located in a remote part of the facility or inside a massive concrete vault, and radioactive as a consequence of their use. The University of Iowa Hospital's forty-four thousand pound Scanditronix MC17 cyclotron was removed in the summer of 2011 and transported to Clive, Utah where it was disposed as low-level radioactive waste. The project was accomplished in order to make room for a new, state of the art machine. This presentation provides an overview of the project for health-physicists. Project details are presented in a format that replicates the project timeline, allowing attendees to follow the project from start to finish. Discussions are accompanied by photo documentation and include waste characterization activities using in-situ counting systems, preparation of the cyclotron for removal, vault wall demolition, ancillary equipment removal and packaging, movement of cyclotron through the hospital, removal of wastes via crane, and conveyance loading and transport. Radiological, health and safety, waste management, and logistic aspects of the project are discussed.

WAM-B.2 Feasibility of Clearance Concept for Daily Release of Small Amount of Solid Materials from Radiation Controlled Area

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In the discussion of the implementation of the 2007 Recommendations of the International Commission on Radiological Protection to national radiation protection systems by the Japanese Radiation Council, the conventional operation of releasing possibly contaminated solid materials from a radiation controlled area after appropriate radiation measurement has been regarded as one of the most important issues in consideration of the consistency with current clearance systems. The regulatory systems for clearance have been enforced since 2005 for bulk amounts of metals and concrete generated from commercial nuclear reactors in Japan, and much experience has been obtained so far. In this study, the feasibility of applying the concept of clearance to the conventional operation of releasing solid materials from a radiation controlled area is discussed on the basis of a detailed and feature survey on the materials released during a periodic inspection of a boiling water reactor power plant. The survey on the release includes the types of materials, the amount, frequency, location of release, the method of radiation measurement, and management systems in the radiation controlled area. The doses to workers and the public that may arise after the release are also assessed considering the exposure scenario developed for the derivation of mass-specific activity concentration applicable to clearance levels in IAEA Safety Guide RS-G-1.7 (2005). The result shows that the conventional operation of the release of solid materials involving the measurement of the surface-specific radioactive density can be considered as consistent with the clearance judgment applied in the current clearance systems.

WAM-B.3 Communication Strategies for Radiation Professionals

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This is an eight hour interactive class with lots of activities and opportunities to participate. We use lecture, case studies, hands-on activities, break-out groups, voluntary role play, and humor to cover techniques and strategies that radiation professionals can use to effectively communicate their message. The class covers the following topics: Words as Weapons (Word choice can make or break your message, offend or befriend the person you are talking to, and prevent or cause costly mistakes. Participants learn the skills necessary to use words to promote and defend their message.); How Technical People Can Successfully Communicate with Non-Technical People; How to Put Your Jargon into Plain English and Ensure That You Were Understood; Influencing Decision Makers (Get your message across to law makers, policy makers, regulators, industry lobbyists, advocates, citizen groups, and others. This covers how the legislature really works - what you were never taught in government class); Advocacy - Your Message Multiplied (How to form and advocacy group and why you might want to. Includes a case study of a successful group advocating for responsible disposal of low-level radioactive waste.); Testimony (Strategies and tips for testifying in court as an expert witness and testifying before a legislative committee as a subject matter expert.); Corporate Communications (Corporate communications start long before ground breaking and continue long after closure. This section focuses on public relations and communicating during emergencies.); Our Future Legacy (Invest in the radiation profession by training the next generation starting in grades K-12 and continuing through college and beyond. Case studies: current programs as examples of what can be accomplished.)

WAM-B.4 Estimation of Waste Volumes from Radiological Incidents

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Exercises constructed around scenarios such as a Radiological Dispersal Device (RDD) incident typically focus on the initial response activities in the early and intermediate phases of the incident. Exercises generally give less attention to the longer-term cleanup efforts, particularly to the management of potentially very large volumes of waste. The United States Environmental Protection Agency (EPA) is developing a tool that employs census information, the Federal Emergency Management Agency HAZUS software, and Geographic Information Systems (GIS) to generate first-order estimates of waste volumes resulting from a radiological incident. The tool allows the user to define zones of contamination and potential response actions to be taken in each zone (such as amount of demolition and/or decontamination technologies employed). Wherever possible, required inputs are automatically generated based on initial geospatial data. Results are generated for different types of

waste materials, including asphalt, concrete, and waste water, which will be important in considering waste management needs. The ability to examine different response scenarios provides significant flexibility for Federal, State and Local officials tasked with developing response plans, including projected costs and response timelines. Application of an early version of the tool to the RDD scenario employed in the April 2010 Tier II Liberty RadEx exercise is described.

WAM-B.5 Reduce Reuse Recycle, Electronic Waste Reduction

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We hear these words often and don't stop to think about the environmental impact of repairing an item rather than buying a new one. Older devices are usually more robust than the new one as manufacturers seek ever lower production costs. The expense of equipment on hand has been realized. Ordering new initiates a chain of production which expands your 'footprint' in more ways than one. Electronic waste is often recycled in places with lax environmental regulations resulting in emissions of toxic substances. The cost of equipment is dwarfed by the programmatic costs associated with change. As a business, the only thing you have complete control over is your expenditures, both financial and environmental.

WAM-B.6 Transportation Challenges and the Security of Disused Sealed Sources: Progress and Prospects for Type-B Package Certification

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Radioactive sealed sources are used thousands of times each day in the U.S. for essential medical and industrial purposes. Proper disposition of these sources at the end of their service lives is essential for their safe and secure management, and necessary to preclude their use in malicious activities, such as in a radiological dispersal device (RDD) or radiation exposure device (RED). However, since the expiration of U.S. Department of Transportation specification Type B containers such as the 6M and the 20 WC on October 1, 2008, the lack of affordable, timely transportation options for sealed sources has posed a significant challenge for the many disused sealed source owners. While the US Government provided special permits and authorizations for continued use of decertified packages on an as-needed basis, most of these have expired. Furthermore, the lack of Type-B containers has posed a challenge to the Global Threat Reduction Initiative's Off-Site Source Recovery Project (GTRI/OSRP), which recovers thousands of risk-significant disused and unwanted sealed sources annually. Without proper disposition, these sealed sources must remain in storage at hundreds of sites throughout the country and around the world. To address these challenges, GTRI/OSRP is currently working with the Los Alamos National Laboratory (LANL) on developing two new Type B containers. The first, referred to for the time being as Little B, is intended to be both a light-weight alternative for shielded heads with design documentation and usable with the IAEA's mobile hot cell, helping facilitate repatriation of US- and foreign-origin sources. The second, referred to as Big B, is intended to serve as a flexible, heavily-shielded container for the recovery of most high-activity Cs-137 and Co-60 sources.

WAM-B.7 Beta Dose Calibration of Thin Contact Colorimetric Dosimeters

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The SIRAD family of thin colorimetric dosimeters was field and laboratory tested by the Department of Homeland Security (DHS), and as reported in 2007 by Gladys Klemic et al. these dosimeters were found suitable for personal gamma radiation monitoring of responders under emergency conditions. DHS test results were summarized in previous midyear meetings. DHS also tested a few dosimeters for response to beta radiation; two dosed to 10 rad were within 10 percent,and two dosed to 20 rad were 40 percent high. Our study exposed both card size and stamp size to uranium glazed plates, to determine whether such plates could be used as available beta check sources. The beta dose to a stamp-size SIRAD was calculated directly to be 21 rad by triply integrating: over an emitted beta spectrum indicated by absorption measurements to be similar to that of Pa-234; over intensities directed toward the center of the dosimeter from differential areas of the plate in circular coordinates; and over mass stopping powers versus electron energy. A calculated beta dose of 21 rad was also obtained using rule-of-thumb beta dose estimation in Shapiro (3rd edition), including a Healy correction of 5 for slant-range incidences. This seemed to confirm our direct algorithm calculation. Emitted beta fluence was estimated from thin-window GM and NaI

count rates. The calculated dose of 21 rad compared reasonably well with an observed darkening estimated at 15 rad. Beta doses calculated using VARSKIN-3 for the same conditions gave 13 rad, close to the observed color change. Although VARSKIN and algorithm differences need to be explained, the SIRAD dosimeters promise to be useful for checking doses in contact with waste containers, as well as doses from skin contamination. They also have applications in checking initial doses of diagnostic and therapeutic treatments with x, gamma, and beta radiations.

WAM-B.8 Application of Soil Segregation Technology to Accurately Assay Concrete Material as a Means to Minimize Offsite Waste

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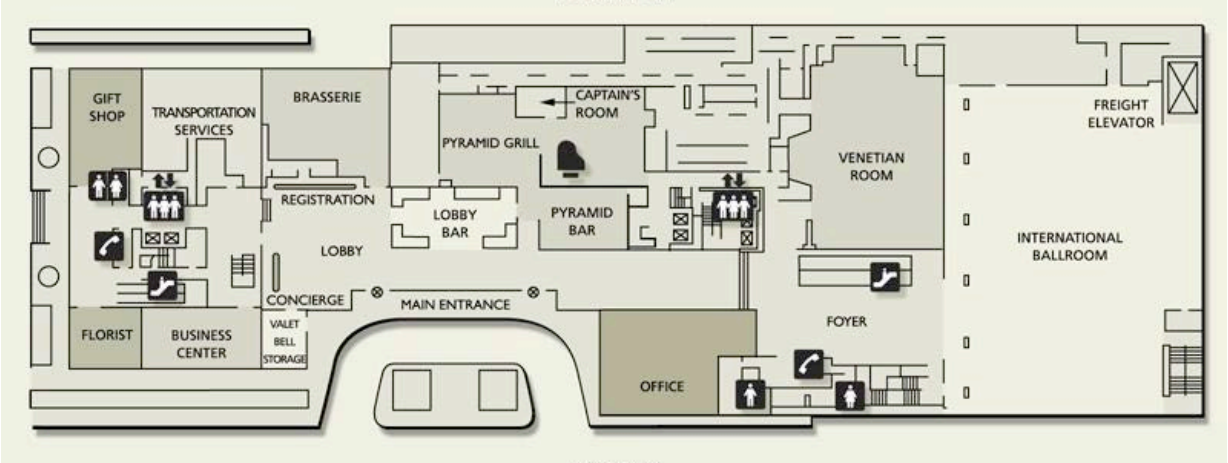
The disposition of radiologically implicated cementatious, bituminous, and other porous debris and material typically involves costly and time consuming decontamination techniques or disposal as radioactive waste. Ensuring compliance with applicable release criteria requires the radiological makeup to be accurately assessed. Many attempt to apply surface cleanup standards (dpm/cm2) and surface measurement techniques to concrete structures and/or rubble. More appropriately, because concrete is a porous material, it should be treated as a volumetrically-contaminated media (pCi/g) and should be measured and evaluated as such. Samples sent to an analytical lab are assessed on a volumetric basis by crushing, drying/grinding, and measuring for radioactivity. The same methodology should be applied in the field. Accurate volumetric measurements of concrete in the field are limited by the ability to establish an appropriate and repeatable measurement geometry. By crushing the porous debris into appropriate sized pieces, the effects of self attenuation can be minimized by precisely controlling the measurement geometry and by applying real-time density correction factors. Although crushing potentially contaminated concrete may result in a small amount of homogenization, the homogenization is found to be minor and results in distinct advantages. Future exposure scenarios are limited, physically controlled, and understood when the volumetrically contaminated debris is crushed. Knowing the activity concentration and isotopic species present, provides a realistic conversion to the estimated potential future dose. Recently, an innovative material segregation technology was applied to volumetrically assay potentially contaminated concrete. Using a conveyor based material handling system, the crushed concrete was assayed with gamma detectors for the nuclides of concern and appropriately evaluated against the volumetric cleanup standards.

Author Index

Floorplans



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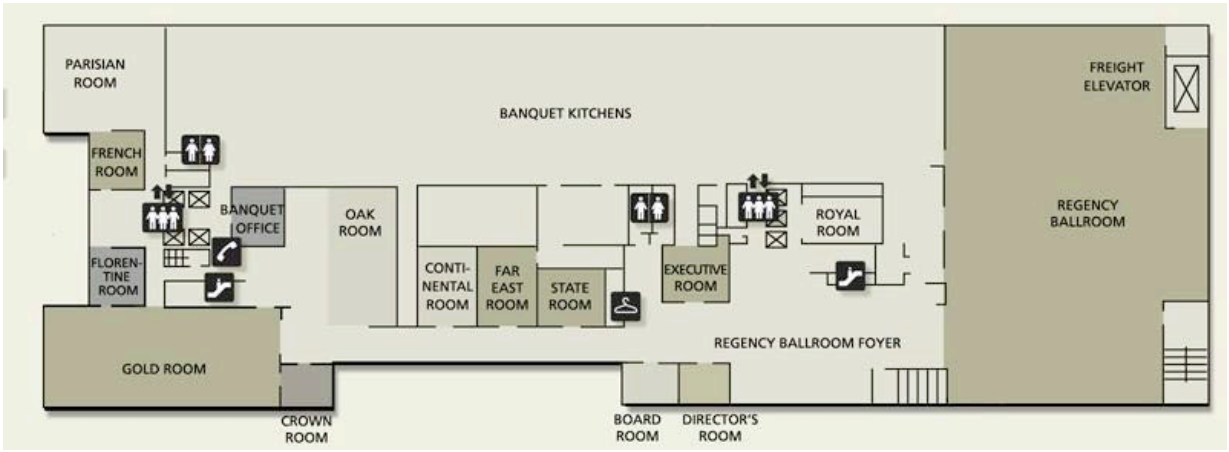

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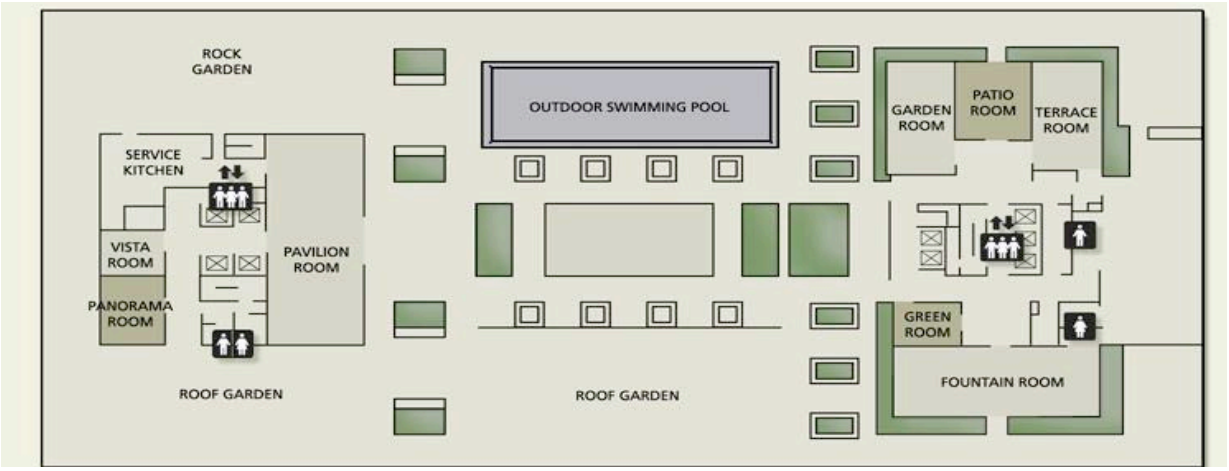

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