|  |  |
| --- | --- |
| **Date**: **Sunday** | **Time** |
| Accelerators and Electron Accelerator Radiation Safety  Tritium Monitoring Solutions and Coming Innovations in Handheld HP Equipment  Duck & Cover, It's Back Again Palomares Dose Reconstruction Pt 1 Underground Nuclear testing ﻿ | 8am - 12pm 1pm -1:30pm 1:30pm - 2pm 2pm - 3pm 3pm - 5pm ﻿ |
| **Date: Monday** | **Time** |
| Response to the Harborview Research and Training Building (Seattle) Contamination The NCRP: Who, What, and Why? Interactions between Accelerator Safety Order 420.2D and 10CFR835 Occupational Radiation Protection Palomares Dose Reconstruction Pt 2 Ludlum Measurements Evaluation of the Domino Micro-Structured Semiconductor Neutron Detector for Applications in Nuclear Material Measurements Modern Day Alchemy at LANL Berthold Technologies Transforming Science into Solutions The Use of the QUIC-DEPDOSE Application in a Radiological Emergency Chapter Meeting ﻿ | 8am - 9am 9am - 9:30am 9:30am -10am 10am - 11am 1pm - 2pm 2pm - 2:30pm 2:30pm - 3pm 3pm - 3:30pm 3:30pm - 5pm |

**Sunday March 17th:**

***Bob May:***

Robert (Bob) May is ES&H Director at Thomas Jefferson National Accelerator Facility

(JLab). Bob has been at JLab for over 30 years where he was hired to establish the radiological

controls and establish the baseline the environmental program. Bob was a health physicist in

the Naval nuclear propulsion program at Norfolk Naval Shipyard for the decade before that.

Bob is a fellow of the Health Physics Society and has served in various capacities in the

Accelerator Section and Virginia Chapter of the HPS. Bob's undergraduate degree is from

Virginia Tech and his Graduate Degree is from Illinois Institute of Technology. Bob will be

discussing various aspects of operational accelerator safety.

**Topic:** Accleerators

**Outline:**

15 mins accelerators in general

15 mins on electromagnetic and hadronic shower basics

30 mins on accelerator energy, power, and basis for radiation source terms

20 mins work problems

10 min break

30 min on radiation source terms and energy regimes

30 min on shielding considerations

20 mins work problems

10 min break

30 mins on emissions and environmental impacts

30 mins on safety program, regulatory and compliance considerations

10 summary

***Ben KlenKlen:***

Ben is the Southwest-Mountain Key Account Manager for Mirion Technologies. He is a veteran of the Naval Nuclear Propulsion Program, where he served as the Lead Engineering Laboratory

Technician for the USS Henry M Jackson (SSBN 730) and for the MTS-626 prototype.

**Topic:** Tritium Monitoring Solutions and Coming Innovations in Handheld HP Equipment

**Abstract:** A discussion of Mirion’s Tritium monitoring solutions and their benefits, focusing on user friendly ion chamber solutions for both portable and stack monitoring applications, as well as glycol free bubbler solutions for HTO and HT uses. We will then discuss coming innovations within our handheld HP product lines including telemetry applications, SiPMs, and desiccant free ion chambers.

***Ken Groves****:*

FHPS is the former President of S2-Sevorg Services,

LLC; a Veteran-Owned Small Business. Ken served as the Deputy Director ES&H,

University of California, Office of the President from 1995-2002. Prior to UCOP, Ken served

in a number of senior management positions at LANL, including Director, Emergency

Management and Response. Ken Retired from his 28 1/2 year career in the United States

Navy in 1986; his last assignment was Director, Navy Radiological Programs Office. Ken has

a BA in Chemistry from UNM and an MS in Biophysics/Health Physics from Texas A&M

University. Ken is a 54 year member of the HPS and a member of both the Military Health

Physics, and Homeland Security and Emergency Response Sections. Ken is an Emeritus

Fellow of the HPS.

**Topic:** Duck & Cover, It’s Back Again.

**Abstract:** Ken will discuss "Duck and Cover"--It's BACK!  A review of how you and yours can survive a nuclear terrorist incident.  Go In! Stay In! Tune In!.

***Steven E. Rademacher:***

Steven E. Rademacher has 35 years experience in Disclaimer radiation safety in the USAF, with expertise in nuclear weapons safety, nuclear weapon accident response and site restoration, and dose reconstruction. Steven has conducted over 1,000 ionizing radiation dose reconstructions in support of Veteran Administration health claims. He has participated in technical basis documents for:

- Enewetak Atoll Clean-up veterans

- Thule AB accident veterans

- DoD personnel and dependents in Japan from the Fukushima nuclear reactor disaster

- Personnel assigned to Johnston Atoll

- AF personnel responding to Dyess AFB accident

**Topic:** Palomares Dose Reconstruction [1966 Nuclear Weapons Accident]

**Abstract:** Palomares 1966 Nuclear Weapons Accident Dose Reconstruction – Part 1

General history of the accident, radiological source term, details of the recovery and dose reconstruction details.

***Glen McDuff:***

Glen McDuff has a PhD in Physics from the Univesity of St Andrews and a degree in electrical engineering from The Texas Tech University. Texas Tech also employed Dr. McDuff as a professor, which probably explains why TTU is still not a tier one school. Glen is retired from the Laboratory, but continues to serve as a consultant to the Weapons Division and to the Defense Threat Reduction Agency’s Nuclear Weapons School at Kirtland AFB because he is full of......obscure weapons knowledge.

Since joining LASL in 1979, Glen participated in virtually every major DOE programmatic failure that unfolded during his long and highly questionable tenure at the Laboratory. He’s on a first name basis with Mikhail “Mike” Gorbachev. Glen also owns and operates several vintage vehicles, and firmly believes that electronics should not be allowed in cars. Finically, the Defense Department considers Glen a prohibited article

**Topic:** Underground Nuclear Testing

**Abstract:** In October 1963 the Limited Test Ban Treaty went into effect. This brough about big changes in the world of nuclear testing. prohibiting nuclear testing. At this time, the U.S. had conducted 210 atmospheric, space and underwater test as depicted below.



The new treaty required:

(1) prohibiting nuclear weapons tests or other nuclear explosions under water, in the atmosphere, or in outer space,

(2) allowing underground nuclear tests ***as long as*** no radioactive debris falls outside the boundaries of the nation conducting the test,

(3) pledging signatories to work towards complete disarmament, an end to the armaments race, and an end to the contamination of the environment by radioactive substances.

So, all testing went underground. \*



This presentation describes the how, the why, and the where, 839 underground test were performed for the next 29 years

\*well almost, but that’s another story

**Monday March 17th**

***John L Bliss:***

John is a currently a consultant and advisor for the Radiation Protection Division at Los Alamos National Laboratory. Prior to his retirement he was theprincipal health physicist supporting LANL nuclear incident response missions, an Assessment Scientist supporting the Federal Radiological Monitoring and Assessment Center (FRMAC), a deployable member of the Accident Response Group and previously led the site-wide operational health physics group and the radiation protection team at LANL’s 800 MeV proton accelerator. John came to LANL following retirement from the U.S. Army. On active duty he supported the U.S. Ambassador to the Soviet Union in Moscow following the accident at Chernobyl and did extensive work with the North Atlantic Treaty Organization (NATO), chairing a working Group on Low Level Radiation in Military Operations. John was the radiation safety officer for several Nuclear Regulatory Commission licensed military installations and activities. He has been a consultant to the National Academy of Sciences A-Bomb Dosimetry Working Group contributing to the re-evaluation of the Hiroshima and Nagasaki dose, the Armed Forces Radiobiology Research Institute, and the International Thermonuclear Experimental Reactor (ITER). He supported FRMAC and DOE during the early response to the damaged Fukushima Daiichi nuclear power station. He is a Certified Health Physicist, a Fellow of the Health Physics Society, and inaugural recipient of the LANL Operations Excellence Medal. He attended Texas A&M University receiving a Bachelor of Science degree in Nuclear Engineering and a Master of Science degree in Nuclear Engineering (Health Physics).

**Topic:** Response to the Harborview Research and Training Building (Seattle) Contamination

**Abstract:** This talk will summarize four presentations prepared for a special session at the HPS annual meeting in 2021. In May of 20219, during the preparation for transport of a cesium source by a commercial company, under contract by the Off-site Source Recovery Program, the source capsule was inadvertently breached resulting in the contamination of a large modern biomedical research building near downtown Seattle, WA. The initial response to the event will be presented as well as the effort to survey and release the extensive ventilation system of the building. Lessons learned and the result of the effort to release the building from radiological controls in April 2021 will be presented and discussed.

***Jeff Whicker:***

Dr. Jeffrey Whicker retired from Los Alamos National Laboratory where he worked as a health physicist and scientist for over 30 years. He received a M.S. in Health Physics and a Ph.D. in Environmental and Radiological Health Science from Colorado State University and is certified by the American Board of Health Physics. Dr. Whicker is an elected Board Member of the National Council of Radiation Protection and Measurements, served as a Board Member of the Health Physics Society, consulted for the IAEA on environmental sampling and remediation decisions, and was on the Editorial Board for the journal Radiation Protection Dosimetry for eight years. He is an author or co-author of hundreds of scientific publications, invited talks, book chapters, and presentations mostly on indoor and outdoor radiological air quality and measurements that span issues ranging from worker protection, homeland security, radiological dose and risk assessment for the public and the environment, and environmental quality. His research in outdoor air quality focused on aerosol transport through wind-driven suspension of contaminated soil and the effects of ecosystem disturbance on environmental transport rates. This research has broad implications for both public and ecosystem health.

**Topic:** The NCRP: Who, What, and Why?

**Abstract:** This presentation will focus on the discoveries and events leading up to the chartering of the National Council on Radiation Protection and Measurements (NCRP) by Congress in 1964 whose purpose is to support radiation protection by providing independent scientific analysis, information, and recommendations that represent the consensus of leading scientists. The structure, contributions, and current activities of the NCRP will be discussed.

***Michael Duran:***

* CHP for 25 years
* Worked at LANSCE accelerator for the past 30 years.
* Received 12 Distinguished Performance Awards at LANL and a ‘Secretary of Energy Achievement Award’.
* Has consistently applied 10CFR835 Occupational Radiation Protection requirements and the IWM process to address radiological hazards.
* Radiological support has included numerous high-hazard, complex target replacement activities with dose rates often in the thousands of R/h, that have involved high-levels of contamination.
* Successfully supported the free release of almost a million pounds of ‘pre-moratorium’ metals for recycle.
* Expertise has included isotopic characterizations of mixed activation products from accelerator operations including medical isotopes (Ge-68, Sr-82, Ac-225), and tungsten target spallation products (Hf-172, Lu-172, Lu-173),
* Has supported the LANSCE User program with a range of experiments that have involved many unique experimental samples, including actinides.
* Participated as a voting member of the LANSCE RSC (radiation safety committee), that has included the implementation of the Accelerator Safety Order.
* Finally, has worked part-time for the last 27 years, as an RP instructor at NNMC (Northern New Mexico College), educating and preparing numerous students for successful careers supporting the Los Alamos National Laboratory mission.

**Topic:** Interactions between Accelerator Safety Order 420.2D and 10CFR835 Occupational Radiation Protection

**Abstract:** Todays’ presentation will discuss how the ASO requirements are addressed by 10CFR835, to ensure adequate protection of workers, the public, and the environment from radiological hazards.

***Steven E. Rademacher:***

Steven E. Rademacher has 35 years experience in Disclaimer radiation safety in the USAF, with expertise in nuclear weapons safety, nuclear weapon accident response and site restoration, and dose reconstruction. Steven has conducted over 1,000 ionizing radiation dose reconstructions in support of Veteran Administration health claims. He has participated in technical basis documents for:

* Enewetak Atoll Clean-up veterans
* Thule AB accident veterans
* DoD personnel and dependents in Japan from the Fukushima nuclear reactor disaster
* Personnel assigned to Johnston Atoll
* AF personnel responding to Dyess AFB accident

**Topic:** Palomares Dose Reconstruction [1966 Nuclear Weapons Accident]

**Abstract:** Palomares 1966 Nuclear Weapons Accident Dose Reconstruction – Part 2

In-depth review of ICRP recommendations for internal dose from ICRP 2 to ICRP 141 and epidemiological data applicable to internal exposure to plutonium from workers. A brief overview of the IREP code will be applied to internal plutonium exposures.

***John LeJune:* TBD will have in the morning.**

***Nick Wehmann:***

Nick Wehmann is a health physicist with Radiation Protection Field Support at Los Alamos National Laboratory. He has worked in Radiation Instrument Calibration and Emergency Response HAZMAT here at LANL, as a civilian Radiation Safety Officer for the Navy, as well as internal and external radiation dosimetry at Hanford. Nick obtained a B.S. and M.S. in Radiation Health Physics from Oregon State University in 2016 and 2018, respectively, and has approximately 7-years of experience in radiation protection. He is also finishing his PhD in Interdisciplinary Engineering (Nuclear engineering focus), with a graduate certificate in nuclear security from Texas A&M University.

**Topic:** Evaluation of the Domino Micro-Structured Semiconductor Neutron Detector for Applications in Nuclear Material Measurements.

**Abstract:** Non-destructive assay of special nuclear materials is a critical tool in many fields such as material control and accountability, national security, and international treaty verification.  Two key methods of non-destructive assay are neutron coincidence counting and neutron multiplicity counting.  Coincidence counting relies on the timely detection of two neutrons within a specific time frame to assess how much special nuclear material is in a sample.  Neutron multiplicity counting operates in a similar fashion, but expands the field of view to assess pairs, triples, etc., of neutrons detected within a given time window.  Multiplicity counting allows for fewer assumptions to be made than coincidence counting and is the preferred method of non-destructive assay for samples containing special nuclear materials due to the increased measurement accuracy for impure samples.

In this work, a different type of detector is evaluated as a general replacement for helium-3 tubes and for suitability as a component in neutron multiplicity counting systems.  The Domino Microstructured Semiconductor Neutron Detector (MSND) has the benefit of not relying on pressurized gas and requires an applied voltage of only 5V.  Furthermore, the nature of the construction of the detector lends itself to faster count processing time, thus reducing detector dead-time, and increasing the accuracy of the system.

***Kirk Rector:***

Kirk Rector received in PHD in Chemistry from Stanford University working at the Stanford Free Electron Laser studying molecular dynamics and vibrational motions of glass forming molecules and proteins. He came to Los Alamos in 1999 as a Fredrick Reines Postdoctoral Fellow in 1999 and converted to staff in 2003. His research career focused on hyperspectal microscopy techniques and applications and he rose to the rank of Group leader of the Physical Chemistry and Applied Spectroscopy group he lead for nearly a decade. Now, he is a Program Director and is the LANL point of contact for all DOE isotope program work that happens at LANL.

**Topic:** Modern Day Alchemy at LANL

**Abstract:**

The DOE Isotope program produces radio and stable isotopes for National and International

customers in support of medical, industrial, government, and research purposes. We will discuss

how we are the modern day users of alchemy principles to create the isotopes that we need. In

addition, there is some discussion on the uses for some of the materials we make. This talk is

intended for the public, non-technical audience.

***Marius Stein:***

Marius Stein serves as Business Development Manager at Berthold Technologies, a German manufacturer of radiation protection and nuclear measurement instrumentation. After earning a master’s degree in economics in Germany, Marius moved to the United States and spent the past 20 years in the industry, starting as Key Account Manager and Subject Matter Expert for International Safeguards at Canberra and in the French AREVA Group. He later managed Canberra’s – and then Mirion’s – channel distribution networks in Latin America and Eastern Europe, before joining Berthold in 2022. Building on Berthold’s extensive presence in Europe, Marius aims to widen the company’s impact in the United States and to bring 75 years of experience in transforming science into solutions to customers that advance nuclear research, medicine, and isotope production.

**Topic:** Berthold Technologies Transforming Science into Solutions

**Abstract:** Overview and discussion of Berthold’s latest radiation instruments and technology.

***Kevin G. Hart:***

Kevin Hart joined Sandia National Laboratories in 2012 after a 20-year career as a US Army Health Physicist.  Kevin has a master’s degree in Radiological Health Physics from Oregon State University, is board certified by the American Board of Health Physics and is certified as a Project Management Professional.  Kevin is currently the Sandia National Laboratory Lead for the Radiological Assistance Program Region – 4. Kevin brings to this position many years of expertise in operational health physics, incident management, training, exercise planning, emergency response, project management, and consequence management.

**Topic:** Radiological Assistance Program Mobiles for Consequencee Management

**Abstract:** The Radiological Assistance Program in coordination with the National Nuclear Security Administration’s Consequence Management Program is developing a new methodology to quickly map the extent and magnitude of a radiological release.  The method uses radiation detection systems traditionally used in the radiological and nuclear search role to collect gamma count rate information from deposited radioactive material and correlate those measurements to dose rate.  This data is then used to adjust the National Atmospheric Release and Advisory Center plume model.  The method provides a real time picture of the ground deposition for monitoring and sampling mission planning of subsequent operation periods.

***John Klumpp***:

John Klumpp is the Internal Dosimetry Program Lead at Los Alamos National Laboratory. He obtained his M.S. in Medical Physics from the University of Pennsylvania and his Ph.D. in Radiological Health Sciences from Colorado State University. He specializes in dose assessment for intakes of tritium, uranium, plutonium, and americium. His research focuses on plutonium biokinetics, treatment of actinide intakes, interpretation of counting measurements, lung deposition of radioactive aerosols, and development of new biokinetic models.

**Topic:** The Use of the QUIC-DEPDOSE Application in a Radiological Emergency

**Abstract:** This presentation describes QUIC-DEPDOSE, a computer application which combines the plume dispersion modeling software QUIC with the internal dose coefficient calculator DEPDOSE. DEPDOSE allows the user to rapidly produce tables of dose coefficients for workers and members of the public inhaling a precisely defined, user-specified aerosols using the ICRP Publication 60 methodology.

Combined with the Quick Urban & Industrial Complex (QUIC) Dispersion Modeling System, this makes

it possible to predict radiation doses downstream from an accidental or intentional release of radioactive

materials. For this work, a radioactive plume was calculated to members of the public downstream from a

hypothetical dirty bomb in Chicago.