The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Radioactive Sources: Applications and Alternative Technologies

Virtual Meeting

PUBLIC AGENDA

November 20, 2020, Eastern Time (ET)

Connection details:

Link: https://nas-sec.webex.com/nas-sec/j.php?MTID=m2c07cd0b51340966a7b0894ee66636e3
Meeting ID: 199 532 0829
Password: PKfppUhU438 (75377848 from phones and video systems)
Host key: 268855
Telephone: +1-415-527-5035 or +1-929-251-9612
Access code: 199 532 0829

1:00 pm – 1:05 pm	**Call Open PUBLIC SESSION to Order and Welcome** Bonnie Jenkins, Committee Chair
1:05 pm – 1:35 pm	**Americium use and security risks** Charles “Gus” Potter, Sandia National Laboratories
1:35 pm – 1:50 pm	**Q+A and Discussion**
1:50 pm – 2:10 pm	**Americium Surrogate Suspension-Resuspension Study** Andrew Glen, Principle Member of Technical Staff, Sandia National Laboratories
2:10 pm – 2:35 pm	**Q+A and Discussion**
2:35 pm – 2:55 pm	**Alpha Emitters: Policy and Quantity for Projection** Steve Musolino, Brookhaven National Laboratory
2:55 pm – 3:10 pm	**Q+A and Discussion**

PRESENTER BIOGRAPHIES

Andrew Glen, PhD, is a Principle Member of Technical Staff at Sandia National Laboratories where he works in the field of aerosol science. He holds a PhD and MSc in Atmospheric Science from Texas A&M University and University of Wyoming, respectively, and a BSc in Meteorology from the University of Reading, UK. Andrew's expertise is in experimental and measurement techniques for various dispersed airborne particulates, where he has focused on both laboratory and field measurements, designing and developing various measurement techniques over multiple platforms. His research spans applications across climatological, biological, chemical and radiological areas. Prior to joining the team at Sandia, Andrew gained 7 years of experience as an environmental consultant specializing in aerosol and gaseous source and emission factor characterization, ambient monitoring and air dispersion modeling.

Stephen V. Musolino, PhD, is a scientist and in the Nonproliferation and National Security department at the U.S. Department of Energy's (DOE) Brookhaven National Laboratory (BNL). With more than 30 years of experience in health physics, his current research interests are in nonproliferation, counterterrorism, and planning for response to the consequences of radiological and nuclear terrorism. Since 1981, he has been part of the DOE Radiological Assistance Program as a team captain/team scientist and has been involved in developing radiological emergency response plans and procedures, as well as participating in a wide range of radiological and nuclear exercises and field deployments. During the Fukushima crisis, he was deployed in Japan as an assessment scientist with the DOE response team that was measuring the environmental consequences of the radioactive material released from the damaged nuclear power plants. He is a member of the National Council on Radiation Protection and Measurements (NCRP) and served on the scientific committee that developed NCRP Report No. 165, Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers and co-Chaired the committee for Report No. 179, Guidance for Emergency Reponses Dosimetry. Dr. Musolino was a member of the team with the Department of Homeland Security that published, Radiological Dispersal Device (RDD) Response Guidance Planning for the first 100 Minutes. Earlier in his career at BNL he was a member of the Marshall Islands Radiological Safety Program and participated in numerous field missions to monitor the populations living on islands affected by nuclear testing. Dr. Musolino earned a BS in engineering technology from Buffalo State College, an MS in nuclear engineering from Polytechnic Institute of New York University, a PhD in health physics from the Georgia Institute of Technology and is certified by the American Board of Health Physics.

Dr. **Gus Potter** is a Distinguished Systems Research Analyst at Sandia National Laboratories. Dr. Potter earned his PhD in Physics at the University of Massachusetts Lowell in 2000 on applications of internal radiation dosimetry models promulgated by the International Commission on Radiological Protection. He is a diplomate of the American Board of Health Physics, being certified in 1997 and recertified through 2017 and a Fellow of the Health Physics Society. Dr. Potter provides technical analysis to US government agencies by conducting end-to-end systems studies and providing expertise in the radiological and nuclear security areas. He has led or participated in studies on radiological and nuclear detection architecture, adversarial threat and risk, and material properties and risk, the results of which have changed national policy on protection of source material and detection strategies. He has briefed a US congressional subcommittee on the radiological and nuclear threat and participated on working groups of the International Atomic Energy Agency devising new international security standards. In his previous work at Sandia National Laboratories, Dr. Potter was responsible for both internal and external radiation dosimetry including interpretation of radiobioassay models and measurements and implementation of thermoluminescent dosimetry technologies. Dr. Potter is

an adjunct professor at the University of New Mexico where he teaches in the Nuclear Engineering Department. He is active in the American Academy of Health Physics as a director and President Elect beginning in 2021 , the Health Physics Society, and a past chair and member of the American Board of Health Physics. His editorial work includes being an associate editor and regular reviewer for *Health Physics* and a regular reviewer for *Radiation Protection Dosimetry*. He also participates in standards activities including being the Vice Chair of the ANSI/HPS N13 Accredited Standards Committee and on two working groups of the International Organization for Standardization. He has written over eighty technical reports, articles, and conference papers for various journals, conferences, and other entities. Dr. Potter is married with two children. His personal interests include cooking, reading, backpacking, and camping.

Abstracts

Alpha Emitters: Policy and Quantity for Projection

The basis for physical and administrative security, and regulation of radioactive material began to evolve in 2003. The National Nuclear Security Administration's Global Threat Reduction Initiative (GTRI) derived a policy and Threshold Quantities to guide a decision to commit resources for security upgrades in a foreign country. The policy defined the materials and quantities considered a threat to US national security interests. Prior to this time, the International Atomic Energy Agency was developing the Code of Conduct on the Safety and Security of Radioactive Sources (CoC). It was published in 2004. The CoC derived its values from a different technical basis than the one used by GTRI. Subsequently in 2005, the Nuclear Regulatory Commission codified the CoC in an Emergency Order which later became 10 CFR Part 37. The regulation established 16 curies as the regulatory basis for ^{241}Am, a slightly larger quantity than the GTRI criterion, 10 Ci. The history and technical differences between these two policies and implications to ^{241}Am security will be reviewed.

Considerations in Evaluation of the Threat of Use of AmBe Well-Logging Sources

AmBe sources are used worldwide for their neutron-emission properties. The larger sources that are commonly available are used in the oil and gas industry for exploration of potential oil wells. These sources lost or a vehicle carrying one or more stolen at some frequency. Dispersion of these sources represents little, if any, human risk and such risk is difficult to quantify due to the concept of "resuspension."