

2018 Health Physics Society Midyear Meeting Professional Enrichment Program (PEP) Abstracts

Sunday:

PEP 1A

Contemporary Topics in Health Physics Part 1

Robert Emery, University of Texas Health Science Center at Houston

Ethical Decision-Making Tools for Enhancing Organizational Safety Culture

Recent investigations of several tragic events have repeatedly identified the absence of a culture of safety as a common contributing factor. An organization's safety culture is a collective reflection of individual decisions made by its workforce, each carrying with them ethical implications. Safety culture, good or bad, is the sum product of many individual ethical decisions, yet the notion of ethical safety decision making is not often discussed. This presentation will describe ethical dilemmas safety professionals may encounter and how the decisions that are made can impact an organization's overall safety culture. A set of ethical decision-making tools will be presented, along with a suggested path forward for actually improving safety culture within an organization.

Radiation Safety's Role in Mitigating the "Insider Threat" Security Risk

While organizations maintain many layers of control to prevent outsiders from gaining unauthorized access to cause loss or harm, persons who have been granted legitimate access can become an "insider threat." Because they are very difficult to detect, these employees cause over \$100 billion in losses annually. Although the typical insider targets assets or data, in some cases their actions can also have significant impacts on workplace and environmental health and safety. Because much of an organization's radiation safety program activities are carried out with the workers in their workplace, this represents a unique opportunity to assist in the possible detection of insider threats. This presentation will discuss the threats represented by insiders and will detail their recognized traits so that radiation safety professionals can enhance their situational awareness and report suspicions to the appropriate authorities.

PEP 1B

Fundamentals of Gamma Spectroscopy

Benson Davis or David Pan, ORTEC

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

PEP 1C

Health Physics Readiness and Response to Natural Disasters

Doug Van Cleef, Mirion Technologies, Inc.

The major natural disasters of 2017 in Texas and Florida serve as a reminder that there is always room for improvement in planning for the unexpected. This course will review and summarize recommendations for advanced planning and response activities in the face of natural disasters. Through participation in this course, students will obtain a thorough review of recommendations for preparation and response to natural disasters from a health physics perspective. The course will include ample time for Q&A and discussion to address specific circumstances.

PEP 2A

Contemporary Topics in Health Physics Part 2

Robert Emery, University of Texas Health Science Center at Houston

The Promise and Peril of “Citizen Science”—and Why This Matters to Radiation Safety

The proliferation of personal electronic devices has resulted in an exponential expansion in the ability to rapidly gather and disseminate information—some accurate, some not so accurate, and some downright wrong. With virtually every member of the workforce and community now equipped with this technology, the notion of “citizen science” has expanded, wherein citizens and employees can collect and instantly transmit data and information about exposures and situations. While this technique holds great promise as a “force multiplier” to address various concerns, the technique is largely unfiltered and can result in the dissemination of misinformation, apprehension, and confusion. This presentation will discuss the evolution of “citizen science” and how it has changed with recent technological developments and then will provide a series of suggested steps for radiation safety programs to take to proactively address the challenge.

Strategies for Keeping Your Radiation Safety Program on Course in a Sea of Constant Change

The University of Texas School of Public Health recently conducted a straw poll of approximately 50 very experienced health and safety professionals and the results were astonishing: 80% had reported to the person they current report to for a period of less than five years, and 25% for a period of less than one year! These striking results underscore the old adage that “change is constant.” But adapting to change is not something that is traditionally addressed in academic health and safety programs. Interestingly, although change is indeed constant, the underlying data that drives radiation safety programs doesn’t change. What does change is the framing of the delivery of this important information to ensure continued program support. This presentation will discuss the dilemma of constant change, provide some tips on the personal management of change, and present options to consider for communicating essential information to the ever-changing environment.

PEP 2B

Fundamentals of Alpha Spectroscopy

Benson Davis or David Pan, ORTEC

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

PEP 2C

Calibration and Use of Current Portable Radiation Survey Instruments

James (Tom) Voss, Los Alamos National Laboratory

There is a mix of traditional and up-to-date portable radiation instrument types in use for radiation measurements. Some of the traditional instrument types (models) were in use 50 years ago and continue to meet the survey requirements. There has been a trend towards lighter-weight and “smarter” instruments in the past few decades. This class discusses a wide range of portable radiation instruments and demonstrates calibration techniques for some of the portable radiation instruments. The attendees will participate in hands-on use of portable survey instruments. The attendees will also participate in calibrating portable survey instruments using nonaccountable sources, pulse generators, and DVMs (digital volt meters).

PEP 3A

Spectroscopy Data Review for Health Physicists

Doug Van Cleef, Mirion Technologies, Inc.

This course presents a quick, but thorough, review of spectroscopy data interpretation by employing a step-by-step review of common gamma-spectroscopy and alpha-spectroscopy analytical report content. In the course of the review, we will draw on the principles and components of the analytical process necessary to generate the data so that the reviewer can assess the quality and usability of the results. As part of the data-review process, we will touch on considerations for method limitations, sample collection, the sample measurement process, calibrations, statistics, and detection decision criteria. Upon completion of this course, students will have a thorough understanding of the data-review process to enable good decision making based on results from alpha- and gamma-spectroscopy analyses. The course will include ample time for Q&A to allow students to address specific application considerations.

PEP 3B

Next Generation of Portable Radiation Survey Instruments

James (Tom) Voss, Los Alamos National Laboratory

There has been a trend towards lighter-weight and “smarter” instruments in the past few decades. This class displays examples of current new generation of radiation survey instruments and discusses where the trend may take us in the future. Questions will be asked about what is needed by the people in the field for the BEST portable radiation instrument. The attendees will use the most up-to-date portable instruments, including those for air monitoring. Portable alpha and gamma spectrometers will be used in this class. The attendees will participate in the calibration of these current new-generation radiation survey instruments. The attendees will also use the instruments to measure activities of nonaccountable sources.

PEP 3C

Radiation in Flight

Joseph Shonka, PhD, Shonka Research Associates

In 2014, measurements of an extreme solar flare that missed earth by seven days, along with analysis that showed such an event had a 10% probability of occurrence per decade, led the United States and United Kingdom science and technology advisors to recommend a course of action should such an event occur. Unlike in the United States, carriers in the European Union and United Kingdom are regulated, and the doses that would have been received exceeded allowable limits. There are no radiation dose limits for U.S. aircrew and passengers. This PEP will summarize the conclusions of those meetings and address both routine and extreme events from radiation that occur in flight. The PEP will also address methods that are being considered to control that radiation routinely and during space weather events. Recent efforts by the International Organization for Standardization to develop standards for measurement of radiation in flight will also be summarized.