Volume V
February/March 2025

Welcome to our newsletter specific to radiation, laser safety and X-Rays. Each bi-monthly newsletter will cover educational topics to assist lab personnel and students that work with radioactive isotopes or use lasers within the lab.

Radiation,X-Rays,and Laser Safety Focus

In the News

Advantages of Small Modular Reactors

Small modular reactors (SMRs) are advanced nuclear reactors that have a power capacity of up to 300 MW€ per individual unit. These reactors are approximately one-third of the generating capacity of traditional nuclear power reactors. Due to their small size compared to large reactors, SMRs can be located on sites that are not suitable for larger nuclear power plants. They can also come in prefabricated units and shipped in pieces to be installed on site. This also allows for possible expansions of the SMRs to adapt to increasing energy needs in the future.

As the technology continues to evolve, the safety measures for SMRs often rely on more passive operating systems, with inherent safety characteristics like low power and operating pressure. This allows that there is no human intervention required to shut down operating systems because passive systems rely on physical occurrences like natural circulation, gravity, and self-pressurization. Due to these increased safety measures, the potential release of radioactive materials to the environment is substantially reduced.

As our population continues to increase into rural areas, SMRs can play a unique role in providing much needed energy. Due to their flexibility of use, SMRs can be installed directly into an existing grid or remotely off-grid, providing low carbon footprint power to remote areas.

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Damage to RNA Found to be Main Cause of Sunburn

I think we all have experienced sunburn in our lifetime, even on the cloudiest of days. It has long been a belief that sunburn damages the DNA. But this may not be the whole picture. According to a new study from researchers at the University of Copenhagen, acute effects of sunburn is caused because of damage to the RNA, not the DNA. RNA is very similar to DNA but is a more transient molecule compared to the long-lived DNA. Messenger RNA (mRNA) carries information from the DNA to make proteins which is the basic building blocks of cellular components. With DNA damage, the mutations get passed down to the progenies of the cells. RNA damage occurs all the time and does not cause permanent mutations, allowing the belief that RNA is less important if the DNA is whole when in fact, damages to the RNA are the first to trigger a response to UV radiation. The study found that the first thing the cells respond to after being exposed to UV radiation is damage to the RNA, which triggers cell death and inflammation of the exposed skin.

Got E-Waste?

The Environmental Health and Safety office is charged with ensuring that all labs and work areas are safe for staff and visitors. Sometimes, the accumulation of non-functioning equipment in small lab spaces creates challenges to the workers. If you have any E-waste or old equipment that can be recycled, please contact Jeff Neistadt at jxn393@case.edu with the following information so we can start the process of getting the equipment properly disposed of or recycled. Please include a description of the E-waste, quantity, location, and if possible, any pictures of the item(s).

Continuing Your Education with The International Atomic Energy Agency

The International Atomic Energy Agency (IAEA) provides many specialized training courses on a wide range of radiation safety subjects suitable for staff and lab personnel dealing with ionizing radiation.

These courses range from one – to two-weeks in length aimed at regulators, health professionals, radiation protection officers or operators, and may focus on topics such as the regulatory framework, external and internal occupational exposure, patient protection (diagnostic radiology, radiotherapy and nuclear medicine, cardiology, hybrid imaging), radioactive waste management, transport of radioactive material, safety of radioactive sources, and safety precautions in industrial applications.

Training packages that support the courses, most which are available online, may include lecture plans and notes, presentation slides, exercises, tests, references, and bibliography as well as material for on-the-job training.

Occupational Radiation Protection

- Assessment of Occupational Exposure due to Intakes of Radionuclides
- Assessment of Occupational Exposure due to External Radiation Sources
- Naturally Occurring Radioactive Material; e-learning
- Neutron Monitoring
- Occupational Radiation Protection; e-learning
- Occupational Radiation Protection During High Exposure Operations
- Occupational Radiation Protection in the Uranium Mining and Processing Industry
- Quality Management System for Radiation Protection Monitoring Services
- Radiation Protection and the Management of Radioactive Waste in the Oil and Gas Industry
- Safety Assessment
- Workplace Monitoring

Protection of Patients

- Doctors using fluoroscopy outside radiology (including urologists, gastroenterologists and orthopedic surgeons)

- Prevention of Accidental Exposures in Radiotherapy
- Radiation Protection in Cardiology
- Radiation Protection in Diagnostic and Interventional Radiology
- Radiation Protection in Digital Radiology
- Radiation Protection in Nuclear Medicine
- Radiation Protection in Pediatric Radiology
- Radiation Protection in PET/CT
- Training on Radiation Protection in Radiotherapy
- Safety and Quality in Radiotherapy
- Dental Radiology
- Radiation Protection in Interventional Procedures: Practical Tutorials

Quality Management

- Quality Management Systems for Technical Services in Radiation Safety

Regulatory Oversight

- Authorization and Inspection of Cyclotron Facilities
- Authorization and Inspection of Uranium Mining and Milling Activities
- Effective and Sustainable Regulatory Control of Radiation Sources (ESRCRS)
- Integrated Management System Training Course
- Organization and Implementation of a National Regulatory Program (I looked this up) for the Control of Radiation Sources
- Organization, Staffing and Competence Management for a Regulatory Body
- Orphan Source Search Training Course
- Regulatory Enforcement
- Radiation Safety Training Course for Custom Officers
- Radiation Safety Training Course for Lawyers

Radiation Safety – Basic

- Basic Training Course on Radiation Protection and Safety

- Navigator in Radiation Safety Communication

Safe Transport of Radioactive Material

- Publication: Safe Transport of Radioactive Material
- Video: Safe Transport of Radioactive Material

Radioactive Waste and Spent Fuel Management

- Training Material on Radioactive Waste Management

Decommissioning and Remediation

- Safety of Uranium Production and NORM Residue Management
- Basic training course on Safe Decommissioning of Facilities
- Specialized training module on Regulatory Control of the Decommissioning of Facilities
- Specialized training module on Characterization to support Decommissioning
- Specialized training module on Safety Assessments for Decommissioning
- Specialized training module on Decommissioning Planning and Project Management
- eLearning on Basics of Remediation of Uranium Legacy Sites

Assessment and Management of Environmental Releases

- Training Material on Control of Discharges and Monitoring

EHS Training Needs?

Are you caught up on your mandatory EHS training? Environmental Health and Safety (EHS) offers several courses for training the Case Western Reserve community in safe practices. Pre-registration is required for all training (in person or zoom) and class sizes may be limited. Training includes:

- Biosafety
- Driver Safety
- Formaldehyde
- Hazard Communication
- Hazardous Materials Shipment
- Laboratory Safety

- Laser Safety
- Radiation Safety
- Respiratory Protection
- Ultraviolet Safety
- X-Ray Safety

Go to case.edu/ehs/training for more information.