Loading a disposal liner at Southwest Research Institute.

Securing radioactive sources

INL team travels the nation recovering and disposing of orphaned radioactive materials

Since 2006, Idaho National Laboratory has established itself as a center of excellence in the recovery of excess radioactive items and equipment from locations throughout North America.

Radioactive sources are used in certain types of cancer therapy, disease control, for nondestructive examination of industrial components, and to kill germs or insects. When facilities have excess, unwanted, abandoned or orphaned sources, INL's Radiological Security Source Disposition team aids in their recovery and disposal.

The program was established as part of the U.S. Department of Energy's National Nuclear Security Administration (NNSA) mission to prevent radioactive sources and hazardous materials from falling into unfriendly hands. INL's team focuses on Category 1 and 2 radioactive sealed sources (as defined by the International Atomic Energy Agency) that may pose a potential risk to health and safety or national security.

The types of equipment and facilities where INL workers recovered disused sources include a wood flooring company that used an above ground pool irradiator for epoxy hardening, radiation equipment from a R&D facility, and blood irradiations from hospitals across the U.S.

Each of these recoveries present different logistical, technical and safety challenges such as building and device location that must be addressed.

'The Emory University Environmental Health and Safety Office would like to extend our appreciation to you and your team for your tremendous work in support of the recovery of the IBL437c cesium irradiator from Emory University Hospital.'

– Michael 'Ike' Hall, assistant director/radiation safety officer, Emory University

Changing the World's Energy Future

Idaho National Laboratory

Cooperative shipments

Working with other federal agencies, state regulators and local governments, members of the INL team identify radioactive sources that might be used for nefarious purposes. The team offers expertise in security, transportation and logistics, helping to move unwanted radioactive sources from hospitals and industrial facilities to licensed disposal facilities.

When NNSA asks for help with recovery and disposal shipments, INL assembles integrated teams of experts from INL, Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory (LANL). Using commercial or DOE-owned trucks, they recover and transport Type B cask shipments of disused radioactive low-level equipment and material, following rigorous safety and security procedures.

The team manages the "Type B" shipping casks needed to transport these sources safely and, with direction and funding from DOE-NNSA, has designed and procured two additional containers.

INL operates two different Type B packages, the 10-160 B and the 435-B, which each have advantages and disadvantages. The 10-160 B is a large shielded Type B package that is able to transport most cesium-137 devices without modifying its certification. But this large cask requires extra planning because it is heavy and hard to maneuver in urban areas. The 435-B Type B package is a small unshielded cask. Its smaller size makes it easier to handle and transport.

At the end of 2014, NNSA's NA-21, Office of Radiological Security, celebrated the recovery of the 1-millionth curie (Ci) of disused and unwanted radioactive sources. A curie is a unit of radioactivity roughly equivalent to the amount of radioactivity in one gram of the radium-226 isotope. In fiscal year 2017, the INL team recovered 15 devices and performed 14 disposal shipments totaling over 70,000 curies Ci.

History

INL's first involvement with the NNSA program entailed working with the Georgia Institute of Technology and Lawrence Livermore National Laboratory experts in 2006 to secure and safely dispose of gamma emmiting cobalt sources from Georgia Tech's irradiator facility in downtown Atlanta.

In 2007, INL staff recovered 18 strontium-90-fueled radioisotope thermoelectric generators from the U.S. Navy's Naval Weapons Station Yorktown in Virginia. The radioactive material recovery and disposition projects set the standard that has been followed ever since.

'I would like to take this opportunity to thank all of you for your outstanding effort during the decommissioning of the blood irradiator at Mount Sinai West on October 17, 2016. (It) was great to see your dedication and attention to details while performing a challenging task.'

– Dr. J. Kamen, Ph.D.,
chief radiation & laser safety officer, Mount Sinai Medical Center

Loading a research irradiator into the 10-160 B package.

Setting up a cask in downtown New York City.

For more information

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