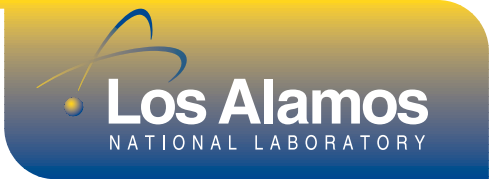


Border Protection



Los Alamos has an unparalleled track record of development, implementation and commercialization of nuclear detection technology. Approximately half of the installed, unattended radiation monitoring equipment used by the International Atomic Energy Agency for nuclear material safeguards worldwide had its foundations at Los Alamos. With new emphasis on such Homeland Security issues as border protection, many technologies originally developed for international nuclear safeguards and materials protection are finding new uses closer to home.

Portal Monitors are specialized radiation sensors optimized for detecting radiation from nuclear materials as a pedestrian or vehicle passes through a choke point. Los Alamos is responsible for research and development, calibra-

tion, and characterization of portal monitors in the United States and installed hundreds of portal monitors at over 38 sites in Russia and former Soviet Republics in support of the Department of Energy's nuclear Second Line of Defense program as well as domestic and international safeguards. Some of these pedestrian and vehicle monitors also can check for radioactive contamination such as what might be generated by a radiation dispersal device or "dirty bomb." Laboratory personnel routinely install these instruments and train operators in their use.

Los Alamos' suitcase-sized radiation portal monitor is designed to be incorporated into common objects, such as entries to bridges, tunnels, or roads, to identify vehicles carrying even small quantities of radioactive materials. This

passive detector uses a plastic scintillator with a photomultiplier tube, based on commonly used pedestrian portal monitors from the nuclear materials detection programs. As part of a multi-laboratory test-bed program working with the Port Authority of New York/ New Jersey, the laboratory worked closely with the manufacturer to define components needing re-engineering for this and future uses.

Hand-held search instruments are pager-sized devices or suitcase-size kits carried by police officers or customs inspectors to search for radioactive materials on a person or in a suspicious container. Based on the programmable rate meters used at the entrance to many nuclear facilities, the hand-held instruments are developed at Los Alamos and characterized using standards set by the American Society for Testing and Materials. Los Alamos users then teach others how to use the portable instruments.

Isotope identifiers are specialized instruments that fill the same general function as hand-held search instruments, usually incorporating the ability to do ratemeter-style search, but also can identify the isotope emitting the radiation. This enhancement allows a user to distinguish between benign radiation emitters such as radiopharmaceuticals and smoke detectors, and the special nuclear materials that officials want to interdict. The RANGER family of isotope identifiers was developed at Los Alamos, and has been commercialized through a license to Quantrad Inc.

Package monitors, which use neutron interrogation to detect nuclear materials in parcels, are an active area of research for the Laboratory. A prototype of a package monitor that can analyze and actively interrogate meter-sized boxes has been successfully field-tested at the U.S. Customs office for international mail in Oakland, Calif. One focus of the research is the hard-to-detect uranium-235 isotope, which might be missed by search instruments.



A Los Alamos firefighter holds the latest in nuclear detection and identification tools, a handheld spectrometer with a Personal Digital Assistant (PDA) as the interface for quick uploading of technical data right from the field.



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