

Advanced methods for radioactive and nuclear (RN) materials detection and characterization

In the global effort to reduce proliferation risks, and misuse, of radioactive and nuclear (RN) materials, effective and affordable technologies are required to improve areas identified by diverse national nuclear regulatory agencies. Canadian Nuclear Laboratories (CNL) is engaged on many fronts to enhance cutting-edge techniques and methodologies to address evolving national and international threats in nuclear safety and security. Examples of on-going initiatives at CNL in the area of detection of RN materials include: improvements in detection capabilities at borders by increasing portal monitors sensitivity and refining decision-making algorithms, set-up of a new test facility for evaluation of radiation detectors employing special nuclear material, development of high-level and dedicated training for front line officers involved in RN detection, study of active neutron and gamma-ray interrogation methods, employment of stand-off radiation detectors (e.g., large area neutron detectors, muon tomography) to locate radioactive materials and support the monitoring of fissile material to prevent diversion, detection of shielded RN materials in cargo containers by integrating several detection technologies, and development of innovative technologies such as liquid argon, liquid scintillator and dual PVT panels enabling gamma-neutron discrimination. In this talk we report on several efforts underway at CNL to strengthen nuclear safety and security program by investigating optimum ways to passively and actively interrogate suspected object for RN material detection and characterization.

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