

Responding to the Detection of Special Fissionable Materials and Other Threat Materials with Case Studies

This paper will discuss the challenges posed in confidently adjudicating alarms when nuclear materials or other potential threat materials are detected in secondary inspection. Primary radiation detection systems are installed at three seaports in Spain. Each of these seaports have a spectroscopic portal monitor (SPM) that is used for secondary inspection. Two additional seaports in Spain have spectroscopic portal monitors installed to inspect cargo. The vast majority of primary alarms that are sent to secondary inspection result in the confirmation of naturally occurring radioactive materials (NORM) as declared on the manifest. However, a small fraction (approximately five percent) of the alarms generated on the SPM are threat alarms indicating the potential presence of radioactive industrial, medical or nuclear material isotopes. Responding to the detection of special fissionable material in secondary inspection presents unique challenges that must be addressed to provide an acceptable degree of confidence that nuclear materials are not being smuggled. These challenges are exacerbated when special fissionable material is potentially detected in land/sea cargo containers. A number of cases studies from Spain will be presented that illustrate the technical obstacles and other challenges encountered.

Challenges

1. Land/sea cargo containers have the potential to contain large amounts of densely packed NORM materials emitting relatively high levels of radiation that can make use of sodium iodide radioisotope identification detectors in the spectrometric portal monitors problematic requiring the use of high purity germanium detectors to exclude the presence of threat materials.
2. Analysis of complex spectra require a degree of training that is not readily provided to the vast majority of spectrometrists in the world as most spectrometrists are trained to analyze spectra related to the nuclear fuel cycle or other industries using radioactive materials.
3. Development of technical procedures for use by front line officers to collect the data needed for remote expert support teams to analyze and properly adjudicate alarms.
4. Providing dedicated 24/7 support to front line officers from expert support team members to provide primary/secondary alarm data analysis to determine if cargo containers need to be detained for tertiary inspection.
5. Social issues surrounding the potential detection of special fissionable materials and the need to control information.
6. Returning containers containing industrial/medical material out of regulatory control (MORC) to the country of origin.

Gender

Not Specified

State

United States

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Track Classification: MORC: Preventing illicit trafficking of nuclear and radioactive material