

Repurposing the Global Network of Radiation Portal Monitors

Thousands of Radiation Portal Monitors (RPM) are deployed worldwide by various government agencies. They are installed at nuclear facilities, border crossings, airports, seaports, scrap metal processing facilities, etc. The most common implementation includes the use of a primary detection and secondary inspection. The first stage is designed to determine the presence of radiation, while the second stage requires segregation of the alarming entity and subsequent isotopic analysis. In some cases, the data is collected and analyzed offline to estimate system health and diagnose root causes of component failures. The most widely used detector type is Poly Vinyl Toluene (PVT) (as well as the similar Poly Styrene (PS)), based largely on cost and detector-size scalability. These poor-resolution detectors are unable to identify alarming isotopes based on energy spectra – but they are able to identify some isotopes through their decay half-life. This fundamental ability of already-deployed systems can be used to augment the data stream used to detect illicit nuclear events. Many global agencies, such as the Comprehensive Nuclear Test Ban Treaty Organization (CTBTO) whose mission is to passively monitor for isotopes associated with nuclear testing would benefit from the addition of a multitude of detectors to their data stream.

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