Material Out of Regulatory Control: Preventing Cross-Border Trafficking

VCDNP

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Facts About Material Out of Regulatory Control (MORC)

* The peaceful use of nuclear and other radioactive material provides socio-economic benefits to many people around the world through health, agriculture, industry and other scientific applications.
* The security of nuclear and other radioactive materials under States' jurisdictions is the responsibility of the State. Radioactive material can fall out of regulatory control due to theft, neglect or improper disposal.
* The risks posed by MORC include potential use in a radiological dispersal or exposure device or an improvised nuclear device, as well as accidental exposure to radiation. This can result in injury, loss of life, environmental contamination, as well as substantial economic and psychological impact.
* States must establish and maintain nuclear security systems and measures for the prevention, detection of, and response to MORC, including radiation screening at borders.
* Detection and inspection activities at borders and international trade hubs can have unintended consequences for trade, including delays in shipments.
* The IAEA can help mitigate these consequences through coordinated research and technology development.

Support Provided by the IAEA

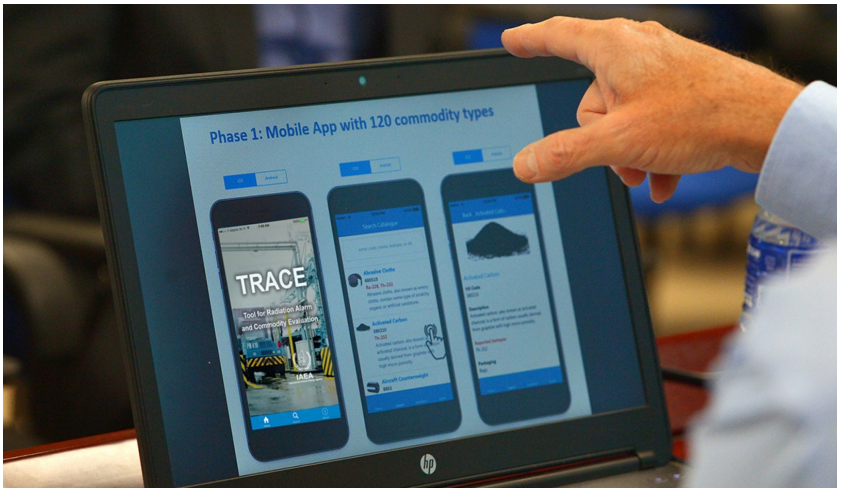
* The International Atomic Energy Agency (IAEA) supports countries in the implementation of nuclear security measures at borders to prevent illicit trafficking through: the facilitation of research on issues central to Member State needs; the development of capacity and tools; and the publication of guidance documents.

⇒ The science and technology projects to provide tools and capacity building are called Coordinated Research Projects (CRPs). CRPs bring together researchers from Member States to work collaboratively for three to five years on a given issue within the IAEA's body of work. Some CRPs related to MORC improve the assessment of alarms from radiation detection instruments and improving radiation detection equipment for detecting MORC.

⇒ One of the innovations under these CRPs was the development of a smartphone application called "Tool for Radiation Alarm and Commodity Evaluation" (TRACE). This helps customs officials determine whether alarms sparked at borders are due to naturally occurring radioactive materials, such as fertilizer, or whether the alarm could indicate hazardous materials.

⇒ The IAEA works with its partners to publish guidance documents to help Member States maintain best practices in radiation detection at borders, including: "Detection of Radioactive Materials at Borders" (2002); "Technical and Functional Specifications for Border Monitoring Equipment" (2006); and "Guidance and Training on Implementation of Effective and Efficient Border Controls" (2020).

More than 10,000 radiation portal monitors (RPMs) and thousands more handheld detection devices are used around the world to detect illicit transport of nuclear and other radioactive material. (Source: Laem Chabang Port Customs Office)



TRACE provides detailed information to help assess radiation instrument alarms. Fast and accurate assessment can minimize the impact of innocent alarms on normal operations, and to enable customs officers to focus on potential transboundary movement of MORC. (Photo Credit: Dean Calma/IAEA)

For More Information

* Detection of Radioactive Materials at Borders, IAEA 2002. Available at: https://www.iaea.org/publications/6657/detection-of-radioactive-materials-at-borders
* Technical and Functional Specifications for Border Monitoring Equipment, IAEA 2006. Available at: https://www.iaea.org/publications/7400/technical-and-functional-specifications-for-border-monitoring-equipment.
* Coordinated Research Project: Improved Assessment of Initial Alarms from Radiation Detection Instruments, IAEA 2015. Available at: https://www.iaea.org/projects/crp/j02005.
* Coordinated Research Project: Advancing Radiation Detection Equipment for Detecting Nuclear and Other Radioactive out of Material Out of Regulatory Control, IAEA 2017. Available at: https://www.iaea.org/projects/crp/j02012.

Country Experiences

Thailand

The Laem Chabang seaport is the busiest in Thailand, with an estimated cargo handling capacity of 8 million TEU (twenty-foot equivalent unit – a unit of measure used to describe the capacity of container ships and container terminals). Customs officials deal with approximately 500 alarms per day, each of which could require a secondary inspection conducted with hand-held equipment that provides low confidence. Customs officers have limited knowledge of radioactive material so they need technology that will assist them in making the decision to inspect or to release the cargo. There have been cases, especially with naturally occurring radioactive material, where cargo triggering an alarm was unnecessarily delayed for up to five days.

The IAEA has supported Thailand to improve this situation through capacity building, training and sharing of best practices, including through a cross-border exercise conducted with Thailand and Malaysia in November 2016. During the exercise, approximately 100 customs officials, police officers and radiation detection experts from the two countries came together to test the effectiveness of their nuclear security systems and discern where there were weaknesses.

Thai customs also participated in the CRP that resulted in the development of the TRACE app (detailed on page one), which helps to differentiate between alarms sparked by naturally occurring radioactive materials and hazardous materials.

Sri Lanka

The Port of Colombo is the highest volume port in Sri Lanka with a handling capacity of 7 million TEU. On average, the Port must address 2000 alarms per month, many of which are false alarms set off by innocuous items, such as wooden cupboards or tyres. As with Thailand, customs officers in Sri Lanka must decide quickly when an alarm is triggered whether to allow the cargo to continue or to stop it for a secondary inspection. To increase their efficiency with the processing of cargo while maintaining the highest security standards, Sri Lanka requested the IAEA's support with capacity and technology development.

Sri Lanka also participated in the IAEA CRP that resulted in the TRACE app. A time study was conducted as part of the CRP to determine effectiveness of improved assessment processes. The average time in Sri Lanka taken to release an alarmed cargo container before the CRP was 58 minutes. In 2019 this time was reduced to 38 minutes, an improvement of 20 minutes in alarm processing efficiency. Over the course of a year, this improvement translates into a savings of over 6,000 man-hours (or 3 man-years) of efforts that can be used for other customs and trade duties.

Nigeria

Nigeria's 4,047 kilometres of land borders are difficult for authorities to control. The lack of capacity and national detection strategy, as well as a high turnover in front-line officers (FLOs), pose unique challenges for the detection of MORC.

The IAEA has been cooperating with Nigeria since the mid-2000s in order to address these challenges, including through nuclear security upgrades in 2005 and the installation of a radiation portal monitor (RPM) at the Murtala Mohammed International Airport Export Terminal in 2009. Unfortunately, the RPM could not be used due to inconsistent power supply, disagreements about which government body had jurisdiction over it and high turnover of FLOs. The IAEA and the US Department of Energy (DOE) cooperate actively with the government of Nigeria to improve the situation

The US DOE has helped to develop a threat and risk assessment for MORC, which will contribute to Nigeria's efforts do develop a national-level nuclear security detection strategy. The IAEA is supporting Nigeria through capacity building activities and the development of a CRP to provide a systematic approach to training FLOs on radiation detection equipment.

Key Takeaways

* Nuclear and radioactive materials have far-reaching benefits and are used throughout the world in health, industry and agriculture. States must, however, take responsibility for managing these materials in a safe and secure manner.
* In addition to having a detection strategy in place that coordinates the activities of all relevant national stakeholders, the detection and prevention of nuclear trafficking requires a collective effort. Through sharing information, experiences and the development of regional and international networks, States can find collective solutions and respond better to threats that have a global impact.
* The detection and prevention of illicit trafficking of nuclear material requires international cooperation, national coordination and the use of science and technology to keep pace with threats and challenges.
* The IAEA's Coordinated Research Projects (CRPs) provide vital support to States. Through these projects States are identifying their own solutions, developing capacity, networks and user-friendly tools that are not only improving nuclear security, but also facilitating trade.

Read Full Report

Please see the full VCDNP report on "Material Out of Regulatory Control: Facilitating Trade While Preventing Nuclear Smuggling" at: www.vcdnp.org/material-out-of-regulatory-control-facilitating-trade-while-preventing-nuclear-smuggling/