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# Development of training for Member States on Maritime Search

This article describes the arrangements currently being worked on provision and promotion of training and enhancement of EPR capabilities of the Member States in the area of Maritime Search for illicit trafficking of nuclear and radioactive materials. The general Conference Resolution GC(57/RES/9 dated September 2013 – Article 70 requests the Secretariat to continue its efforts to develop, in close cooperation with Member States, guidance for States on how to respond to a maritime emergency involving radioactive material, and to continue discussion with interested Member States on how appropriate preparedness and response information can be made available to appropriate authorities, taking into account the requirements as regards nuclear security and safety.

Maritime transport remains the dominant mode for international trade both for bulk transport of commodities and containerized break-bulk cargo. The system of international maritime shipping handled approximately 230 million twenty-foot equivalent container units (TEU) in 2000, of which 31 million TEU (17 million actual container boxes) came through North American ports. Shipping containers account for 95% of U.S. import-export cargo tonnage. Under normal conditions, the system of international maritime transport depends on the ability to maintain a steady flow of container traffic through the world's major ports. Efforts to achieve a secure system must not threaten the economic viability of the network and, by extension, the system of global trade. To be able to develop, acquire, and support the deployment of an enhanced national system to detect and report on attempts to import, possess, store, transport, develop, or use of unauthorized nuclear explosive devices, fissile materials, or radiological material happens to be an important goal for many Member States in order to deter, interdict and mitigate the use of nuclear or radiological materials for malevolent usage. In general, the Member States adopt a radiation detection strategy commensurate with the assessed threat of criminal or unauthorized acts or inadvertent movement of radioactive material. If a high level of assessed threat is present, the policy is to adopt a wide-ranging monitoring programme in which all border crossing points, maritime ports and airports are screened by the deployment of fixed installed RPM systems. Mobile equipment could be used as well for random search or target vehicles.

Development of a Maritime Capability for shipboard search is essential due to the threat from malevolent marine shipment of radiological material and in recognition of both operational and radiological challenges of shipboard search. Several aspects of a search aboard ship are unique. A ship may be stopped while underway at sea, on rivers, or in ports. Stopping a ship is a public domain event likely to attract media attention and, for this reason, a search must be successfully completed in a timely fashion. Furthermore, searches in confined or narrow spaces (e.g., between cargo containers) require the use of compact and highly portable search systems. Positive aspects of aboard-ship searches include immediate access to the shipping manifest and to knowledgeable, local guides for vessel exploration.

Measurements of gamma radiation by means of portable devices or easy-to-deploy fixed systems aboard ships reveal low backgrounds lacking most terrestrial components that are attenuated by the surrounding water. The overall gamma background rates are generally quite low, making the detectors more sensitive to man-made radiological material. Shipments containing TENORM materials should be taken into consideration occasionally. Both dose rate meters and gamma spectrometers are recommended for these measurements, the latter types with on-line evaluation capability are more advantageous. In contrast, the neutron background aboard ships relative to the surrounding water has been observed to be elevated. A significant radiological challenge is the Ship Effect, which is an excess of neutrons observed when approaching a ship isolated from land.

Elaboration of the Ship Effect will be made in the main article. The phenomenon of the neutron background on or near a large ship is unique and attributed to cosmic-ray interactions in the ship's steel and cargo. This effect has become known as the Ship Effect. The Ship Effect is explained as an excess of neutrons measured when approaching a ship constructed of conventional materials. Teams approaching or boarding a ship with a neutron detector may interpret elevated neutron count rates as a malevolent neutron source.

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