

ENCOMPASSING A SYSTEMIC RESPONSE TO INVESTIGATIONS OF NUCLEAR AND RADIOACTIVE MATERIAL OUT OF REGULATORY CONTROL

The IAEA's Incident and Trafficking Database (ITDB) compiles 3497 confirmed reports of nuclear and other radioactive material out of regulatory control (MORC) from 1993 to 31 December 2018 to include 253 incidents involving unauthorized acts reported in 2018. Better recording of trafficking incidents, improvements in the resolution of alarms emanating from radiation detection events, and comprehensive plans and preparation for nuclear security management and mitigation are the result of the availability of published guidance, exercises to test national and regional capabilities, comprehensive training, as well as advances in research to facilitate consequence management. Optimized nuclear security practice involves systematic implementation of nuclear security practices across the spectrum of situational awareness of MORC, radiation detection architectures, radiological response to include those involving crime scenes, nuclear forensics to identify the origin and history of MORC as well as resulting investigative leads. Expertise and infrastructure - whether it be radiation detection, evidence collection, or nuclear forensics - implemented in isolation is not as effective as interfaced efforts that promote the systemic response to a nuclear security event.

The challenge for an effective plan to address a nuclear security event involving MORC is to bridge discipline boundaries involving physical science, biological/medical science, engineering, digital science, jurisprudence, political science, information science, and international relations to provide a systemic response. Important is to identify and utilize existing capabilities and expertise within States (to include regulatory authorities, the university, research institutes, industry, medicine, nuclear operators, police, first responders, and relevant ministries). Nuclear security disciplines do not work in isolation. To this end, nuclear trafficking reports inform information alerts, radiation detection informs radiological response, radiological response informs nuclear forensics and nuclear forensics informs an investigation. Awareness maintained across the nuclear security spectrum is the key to the development and sustainability of an effective nuclear security regime given the dynamic and ever-evolving nature of the threat. Actions taken at the scene of a nuclear security event to collect evidence have profound implications for the confidence in the ensuing nuclear forensic laboratory analysis, findings and conclusions. Coordination and cooperation is enhanced through national and regional measures (to include bi-lateral arrangements) that facilitate bespoke and timely solutions where they are needed to prevent and mitigate. Multi-laterally, by exploiting the accomplishments of the IAEA, the Global Initiative to Combat Nuclear Terrorism, INTERPOL, and the Nuclear Forensics International Technical Working Group, and others, information can continue be to effectively shared between the nuclear security scientists, law enforcement, responders and policy makers to prepare for response. Going forward, common applied field, laboratory and table-top exercises, realistic trainings to include nuclear and radioactive materials studied under controlled conditions, cross disciplinary research to improve forensics examinations as well as broader outreach that spans response and investigations are imperatives.

Gender

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