

Development of Nuclear Forensics Capabilities within the Nuclear Security Regime

Nuclear forensics (NF) is internationally acknowledged as an integral part of the robust national nuclear security regime that supports law enforcement investigations of nuclear security events (NSEs). NF could deter unauthorized and malicious acts through its ability to link material to perpetrators, whereas the conclusions drawn by NF analysis about the material origin confer a valuable contribution to the prevention of future malicious acts from the same source. Moreover, by determining the origin and history of the material, NF assists the State to identify gaps and weaknesses in the applied security measures and to make informed decisions on where to strengthen its nuclear security architecture. The crucial significance of NF calls States for developing a national strategy to establish, test, enhance, and sustain their own forensics capabilities within the national nuclear security infrastructure. In this regard, the paper provides an overview on the elements and measures to be considered by the State to start developing its NF capacity and the associated actions to be taken to ensure sustaining and maintaining this capacity. The extent of the NF capabilities should commensurate with the existing and planned materials and activities in the State and it includes legal and regulatory framework incorporates NF, robust technical infrastructure, competent and sufficient human resources, and national nuclear forensics library or material information directory. Nevertheless, the national political commitment to nuclear security is vital in developing NF capabilities, as national policies that support NF are required and equally important as the NF science itself.

At the national level, NF capacity could be developed with a modest investment if the State decides to integrate the existing resources into NF capabilities. Since the State possesses a mature nuclear infrastructure, this approach would cut costs and provide new and possibly unexpected synergies between NF and other applications. The paper provides a practical insight to develop the national forensics capabilities and discusses the idea of integrating the existing national resources and infrastructure, which were created and maintained for other purposes, into NF as an effective starting point. It also portrays how the existing resources can be re-purposed for NF in line with the International Atomic Energy Agency (IAEA) recommendations and guidance and provides a roadmap for sustaining these capabilities. Moreover, the paper recommends establishing a national nuclear forensics center (NNFC), with a view to contributing to the national response plan in close cooperation with other relative authorities and institutions. Particular attention is given in the paper to the contribution of technical support organizations (TSO) and nuclear security support centers (NSSC) in maintaining and sustaining the developed NF capabilities. Recognizing the critical role of coordination and cooperation between various stakeholders in the effective management of NSE, the paper highlights the developed coordinating mechanism to ensure that the various response measures encompassing NF are taken coherently by the responsible stakeholders.

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Track Classification: MORC: Nuclear forensics