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Building and Maintaining an Enduring Nuclear Forensics Capability –UK Case study

Nuclear forensics is defined by the International Atomic Energy Agency (IAEA) as the "examination of nuclear and other radioactive materials using analytical techniques to determine the origin and history of this material in the context of law enforcement investigations or the assessment of nuclear security vulnerabilities". It is a complex, multi-disciplinary, multi-faceted activity that draws upon a diverse range of technical capabilities from crime scene through to the use of technically advanced analytical methods on nuclear or radiological materials. Many Member States have established nuclear forensic capabilities, and 'Nuclear Forensic Libraries' . The UK presented at this conference in 2019 on the construct of the hub-and-spoke, virtual library model which establishes a network of knowledgeable subject matter experts from across the defence and civil nuclear sectors, with access to information and data to aid the provenance of Material Out of Regulatory Control (MORC).

Further details of this model are provided to highlight the cost-effective establishment and deployment of a robust nuclear forensic library capability, able to deliver the required, highly visible deterrent whilst simultaneously able to provenance nuclear and radiological materials without the need to establish dedicated teams or capabilities. Through harnessing the UK's defence and civil nuclear national laboratories, an effective and cost-effective nuclear forensics capability has been established. As national laboratories, their respective core missions provide the basis for an enduring technical community that is applying and developing its expertise in the delivery of nuclear solutions to its customers. These programmes, for example include support to addressing the challenges associated with managing the UK's nuclear legacy, supporting current operating facilities, and enabling the contribution of nuclear to achieving net zero. These, and other capabilities are directly applicable to the identification and provenance of MORC if ever needed in a nuclear forensics' context.

Core national programmes aiming to develop advanced future fuel cycles as part of the UK energy strategy, and other complementary programmes to maintain skills, ensure that the UK nuclear industry is vibrant, and attracts high calibre scientists. This provides a route to sustaining and maintaining expertise critical to an enduring nuclear forensics capability, coupled with knowledge management to ensure access to records and transfer of knowledge and experience from present SME's. Facilities utilised for the safe and secure delivery of the UK nuclear programme provide much of the infrastructure and capability to attract such individuals and deliver this approach to sustaining an enduring nuclear forensic capability.

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