

# Development, Implementation, and Sustainability of a National Nuclear Forensics Library Capability to Address Nuclear and other Radioactive Material out of Regulatory Control

## Summary

The extended abstract provides a historical context and overview of a National Nuclear Forensics Library, henceforth 'Library', summarizes outcomes of the technical session on Libraries from the 2019 IAEA Technical Meeting on Nuclear Forensics: Beyond the Science, and offers an outlook of Library development, implementation, and sustainability over the next ten years.

## Description

In support of an investigation of nuclear or other radioactive material found out of regulatory control (MORC), nuclear forensics provides technical information useful for identifying MORC and determining its provenance in the context of international legal instruments and national laws related to nuclear security. A Library is one mechanism for evaluating data from a nuclear forensic examination to determine if MORC is consistent with materials used, produced, or stored within the borders of the State in which it was recovered. This is critical information for investigators, both for identifying and addressing potential nuclear security issues within a State's borders, or, if it appears MORC originated from another country, provides a mechanism for queries and dialog with other possible source countries.

The creation of Libraries has been supported by the IAEA, Nuclear Forensics International Technical Working Group (ITWG), the Global Initiative to Combat Nuclear Terrorism (GICNT), and the Nuclear Security Summits, but development internationally has been slow, due to the complexity of the task to develop, maintain, and sustain a Library in a national context.

While the impetus for the development and use of a Library in support of nuclear forensics examinations have been a consistent theme at the policy making level, mechanisms for Library implementation and use for the identification of MORC is something richly debated. The IAEA publication, Development of a National Nuclear Forensics Library: A National System for the Identification for Nuclear or Other Radioactive Material out of Regulatory Control, provides policy makers, competent authorities, law enforcement officials, and technical personnel with information about the role and benefit of establishing and using a Library as part of a nuclear security investigation and imparts context for the use of a Library to identify the origin and history of MORC. More specifically, it provides information helpful to understand where to find and how to organize the technical expertise and data resources needed to successfully implement a Library, and mechanisms for how to seek the international cooperation or assistance sometimes necessary to identify MORC.

While guidance is available from the IAEA, Member States highlighted, as part of the 2019 IAEA Technical Meeting on Nuclear Forensics: Beyond the Science, that Libraries, although driven by the same goal, are not implemented in the same fashion globally, and Member States are choosing unique approaches to developing, maintaining, and sustaining a Library. Presentations given at the 2019 Technical Meeting highlighted that there is no 'one-size fits all' methodology for Library development, but all participating parties supported the basic concepts that a country should be able to use nuclear forensic examination data to identify materials from their holdings, and be prepared to engage international partners if necessary to support a nuclear security investigation involving MORC.

Looking forward over the next ten years, more states are expected to develop a Library as part of their domestic nuclear security program. The diversity in how states organize or access the data and subject matter expertise necessary to assess provenance will continue to grow as the Library concept continues to gain broader acceptance as a critical capability for supporting MORC investigations. This diversity is a recognition that no single prescriptive approach to implementing a Library and method for requesting assistance from international partners is appropriate, and each state must decide how to ensure they have a robust mechanism for determining if MORC is consistent with domestic holdings.

## Gender

Male

## **State**

United States

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