

Legal considerations for the application of nuclear forensics in the context of nuclear security

Nuclear forensics is a multidisciplinary field where science meets law. While the conduct of a nuclear forensic analysis requires advanced scientific capabilities, the ultimate purpose of the forensic investigation is to deliver reliable and relevant evidence for a number of purposes, including in legal proceedings. Nuclear forensic capabilities are not established in a legal vacuum: their application in legal proceedings finds its foundation in national legal frameworks that criminalize unauthorized acts related to nuclear and other radioactive material. In addition, nuclear forensics support the implementation of measures required by the international legal framework related to nuclear security.

International legal instruments for nuclear security, such as for example the International Convention for the Physical Protection of Nuclear Material (CPPNM) or the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT), create a number of obligations relevant for the application of nuclear forensics. In particular, they create obligations that require States to:

- create offences in relation to specified intentional actions involving the misuse of nuclear and other radioactive material
- prosecute said offences
- implement mechanisms for cooperation as well as for requesting, receiving and providing assistance with the investigation of nuclear security events

Furthermore, numerous legal considerations have to be taken into account in connection with a nuclear forensic investigation. They amount, on the one hand, to provisions related to admissibility of evidence (1) and, on the other hand, to provisions related to the regulatory framework for the safe and secure handling of analysed material (2):

1. Procedures and methods are established for the admissibility of traditional forensic examinations in a courtroom; similar legal requirements apply to nuclear forensic examinations. The management of a nuclear forensic investigation must answer to rigorous requirements of prosecution. It is subject to the same rules as traditional forensic evidence but raises a number of additional challenges due to the inherent nature of the material. Rules of collection and handling of evidence, chain of custody, confidentiality, the preservation of evidence and documentation and the means of reporting findings should all have a sound basis within the legal system of each individual country which possesses and uses nuclear forensics capabilities.
2. The national legal and regulatory framework should support and empower competent authorities with a role in nuclear forensics so as to ensure that their roles and responsibilities for nuclear forensics in relation to nuclear security events are clearly defined. It should also contain adequate provisions for implementing nuclear forensic capabilities (national response plan, etc.), as well as for the safe and secure storage of evidence and transport. These are often provisions to be found in nuclear legislation, but their applicability to nuclear forensics should be ensured and adapted when necessary.

The paper will focus on legal considerations found in international legal instruments that are relevant for the application of nuclear forensics in response to nuclear security events and analyse how nuclear forensics support the implementation of these measures, thus contributing to strengthen nuclear security. It will also address the legal considerations that have to be included in the national legal and regulatory framework to ensure that nuclear forensics serves its primary purpose: provide reliable evidence in the context of legal proceedings under international or national law related to nuclear security.

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