Regulatory Design for Transport Security Regulations of Nuclear and Other Radioactive Material

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Abstract
A cornerstone within a nuclear security regime of a country is a legislative and regulatory framework that both regulates the individuals using radioactive and nuclear materials, but also regulates the regulators for their commitments under International Law. When drafting nuclear law and regulations, both technical and legal expertise is needed to ensure the regulation meets the technical requirements for security, but also is legally enforceable within a country's jurisdiction. While the Primary Nuclear Law, or Enabling Act provides establishes the Competent Authority and responsibilities for nuclear security, regulatory development is where the proverbial, rubber meets the road for requirements. The regulations provide instruction for inspections, authorizations, and managed activities, such as use storage, and transport. Transport Security regulatory development for radioactive and nuclear material is complex because the regulation maybe multi-jurisdictional, multi-modal, and involve multiple stakeholders. Development of transport security regulations requires coordination with other ministerial stakeholders, transport operators, and alignment to international treaties and conventions outside the nuclear domain. This paper provides a brief discussion of the challenges associated with regulatory development for transport security regulations for nuclear and other radioactive materials in transport. The paper will briefly identify key stakeholders, international law involved, and current efforts by the International Atomic Energy Agency (IAEA) in supporting Member States in regulatory development. While active in that regulations are necessary for a robust nuclear security regime, regulatory development is more a slow-burn than an active activity in nuclear security.

Introduction
At the foundation of a robust nuclear security regime is a legislative and regulatory framework that clearly delineates the requirements for the peaceful use of nuclear and other radioactive material. Broadly defined, the field of nuclear law is defined as "the body of special legal norms created to regulate the conduct of legal or natural persons engaged in activities related to fissionable materials, ionizing radiation, and exposure to natural sources of radiations" (Stoiber, *et al.* 2003). When focusing on the "security principles" of nuclear law, the threat for diversion, sabotage, or development of nuclear and other radioactive materials by non-state actors poses significant risks to society. Insofar as a country has a nuclear law, the nuclear law should account for provisions of physical protection, both at sites and transport, emergency preparedness, and safeguards, and export control (Stoiber *et al.* 2003).

Regulating transport of nuclear and other radioactive materials poses challenges for nuclear security. First, by its very nature, the transport of material is mobile, with material crossing multiple jurisdictions, potentially using multiple modes of transport, and involving multiple stakeholders, both in the public and private sector. Another challenge with transport security regulatory development is the timeline in which a regulation may be developed. Because transport safety regulations have been promulgated first, there may be a tendency to try and amend the existing transport safety regulation to include security provisions. This process can lead to incomplete security requirements or mis-

alignment to recommendations for nuclear security provided for by the International Atomic Energy Agency (IAEA).

This paper will briefly describe the challenges with regulatory development of transport security regulations for nuclear and other radioactive materials. First, the paper will briefly describe current international conventions in the field and describe existing challenges to regulatory design. The paper will introduce the IAEA Nuclear Security Series (NSS) guides to help countries in the development of transport security regulations. Finally, the paper will briefly discuss current IAEA efforts to develop a methodology for regulatory development for transport security regulations. Ultimately, regulatory development is more of a slow-burn process, requiring active participation, but relying heavily on the regulatory processes and rulemaking within a given country's legal system, there is no quick fix, rather a deliberate process.

Current International Instruments for Transport of Nuclear Material

Starting in 1956, the United Nations Committee of Experts on the Transport of Dangerous goods developed a classification system for handling dangerous goods. There are nine classes with radioactive material being classified as Class Seven (Class 7) (United Nations, 2009). At the outset, the primary focus of the recommendations was on safety considerations, with the United Nations Committee using the 1996 edition of the IAEA Regulations for the Safe Transport of Radioactive Material (Stoiber *et al.* 2003; IAEA, 2000).

In addition to the regulations and recommendations developed by the United Nations, in tandem with the IAEA, other modal organizations such as the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) have international instruments for the safe transport of dangerous goods. These conventions include the Convention on International Aviation (the Chicago Convention), the Safety of Life at Sea (SOLAS) Convention, the International Maritime Dangerous Goods (IMDG) Code, and the International Ship and Port Facility Security (ISPS) Code. Regionally, countries have also developed procedures for the safe carriage of hazardous materials, including Class 7. In Europe for example, the European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) Convention, the Intergovernmental Organization for International Carriage by Rail (COTIF/RID) Convention, and the European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterway (ADN) provides further guidance for transport in specific countries.

While all these international instruments govern the safe transport of hazardous materials, one of the fundamental conventions for nuclear security during transport is the Convention on the Physical Protection of Nuclear Material (CPPNM, 1980) and its subsequent Amendment (CPPNM/A), (CPPNM/A, 2005). The Convention provides coverage for nuclear material in transport and obligates parties of convention to provide physical protection measures for nuclear materials in transport, both interstate and intrastate using recommendations provided in IAEA Information Circular 225 (INFCIRC/225/Rev.5). The Convention also requires parties to criminalize acts specified, to include misusing or threatening to mise use nuclear materials to harm the public and prosecute/extradite those accused of committing the above-mentioned acts. It should be noted that while the Convention provides coverage for nuclear material in transport, the Convention does not cover ionizing radiation sources.

Regulatory Design Challenges

While the previous section highlights the various international instruments relating to the transport of dangerous goods, it also illustrates some challenges in the regulatory design of a transport security

regulation of nuclear and other radioactive materials. At a global level, the CPPNM and the CPPNM/A only cover nuclear material. The Convention and its Amendment do not cover ionizing radiation. In response, the IAEA developed the Code of Conduct on the Safety and Security of Radioactive Sources and the supplementary Guidance on the Import and Export of Radioactive Sources. While providing guidance, the Code of Conduct is not legal binding, rather is a political commitment by the Member State that has little to no force of law.

A fundamental challenge in regulatory development for transport security is the fact that transport security is a relatively new concept compared to transport security. The UN Committee of Experts on the Transport of Dangerous Goods primarily focuses on the safety elements of transport for these materials. Likewise, ICAO and IMO follow similar pathways in focus on safety, rather than security. While the ISPS Code provides for maritime security, its alignment to IAEA guidance on transport security is unclear. This highlights interoperability challenges between the IAEA, ICAO, and the IMO when it comes to the harmonization of transport security in general and the transport security of nuclear and other radioactive material.

Outside the international instruments, the development of regulations within a given country depends on the legal system and regulatory processes in place for such actions. Because nuclear law, generally, sees the creation of a competent authority for nuclear materials and their activities/functions, including security, this creates possible regulatory fragmentation. If an Enabling Statute creates a new Competent Authority within a country vested with responsibilities for nuclear security, including in transport, how does this agency interact with pre-existing agencies, such as a Ministry for Transport or Ministry of Interior? Furthermore, if existing regulations for transport exist for Class 7, how does the new nuclear Competent Authority develop regulations so as not to either conflict with existing regulations or create redundancy in regulations where they are acting *ultra vires* of their statutory mandate.

IAEA Nuclear Security Series for Transport Security and Regulatory Development

The IAEA provides support for Member States in developing transport security regulations. While INFCIRC/225/Rev/5 is the most updated recommendations for implementation of the CPPNM and the CPPNM/A, the IAEA also provides the Nuclear Security Series (NSS). The Nuclear Security Series is a collection of documents that provide guidance and recommendations for developing a security regime, including regulatory development. Within the transport security domain, the two primary NSS documents addressing this are NSS-9, Security of Radioactive Material in Transport and NSS-26-G, Security of Nuclear Material in Transport. Each of the guides describes a graded approach to developing a security regime for transport of radioactive and nuclear materials. Each guide provides recommendations for a variety of issues involved in transport, including tracking technology, trustworthiness of personnel, security verification, communications, and requisite training to ensure material in transport is not stolen or diverted (IAEA, 2015; IAEA, 2008).

Recognizing the importance of regulatory development, especially in the transport context, the IAEA Division of Nuclear Safety and Security has also been working on the development of a methodology for regulatory development for transport security. Bringing together experts from IAEA Member States, the goal of the methodology is to provide an adaptable regulatory process for Member States to use in developing their own transport security regulations. The process tries to account for challenges in regulatory coordination within a given Member State and adapt to the nuclear law regime in a given Member State. Recognizing different legal systems and traditions, the process is flexible in such that it provides for changes and is iterative to allow for multiple stakeholder engagement, both public and private entities.

Regulatory Development: A Slow-Burn Process within Nuclear Security

Regulatory development, whether for transport, facilities, or other aspects of nuclear law takes time. However, the import of such activities cannot be understated. The challenges in transport regulatory development require coordination of multiple instruments, agencies, and individuals to ensure the regulation provides the necessary security within that country's nuclear legal regime. While it is not an instantaneous change or an activity that happens overnight, the slow-burn required for regulatory development makes its importance within the nuclear security regime an important element to consider.

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