

Strengthening Safety and Security Competence through Inclusive Stakeholder Engagement in the Transport of Radioactive Material in Indonesia

Indonesia is preparing to operate its first nuclear power plant by 2032, marking a critical milestone in its national energy transition and long-term net-zero target. One of the most sensitive stages in this development is the transport of nuclear and radioactive material, which requires addressing dual challenges: ensuring safety against accidents, radiation exposure, and environmental contamination, while simultaneously safeguarding security against theft, sabotage, or other malicious acts. This research introduces a Grand Design Competency Framework that strengthens national readiness for transport operations by integrating safety and security into a single structured approach. The framework supports the establishment of competent authorities, reliable compliance assurance mechanisms, and capacity building for transport personnel. Key strategies include competency mapping across safety and security domains, development of inspection and monitoring systems, adaptive training modules, and multi-stakeholder validation with regulators, operators, and security forces. The outcomes provide clear role definitions, measurable benchmarks for personnel competence, improved institutional coordination, and enhanced preparedness for safety and security scenarios. The novelty lies in embedding both safety and security competencies together well before nuclear power operations commence, offering Indonesia and other Member States, a replicable model for resilient, transparent, and trusted radioactive material transport systems.

Country or International Organization

Instructions

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Track Classification: Track 1 Legislative and Regulatory Framework for Safe and Secure Transport