

CHALLENGES AND OPPORTUNITIES IN DEVELOPING MALAYSIA'S FIRST CERTIFIED TRANSPORT PACKAGE FOR RADIOACTIVE SOURCES

Malaysia's current reliance on imported transport packages for radioactive materials presents several challenges, including high procurement costs, logistical delays, and dependency on foreign suppliers. This issue is particularly critical for time-sensitive applications such as medical isotopes with short half-lives, as well as for industrial non-destructive testing (NDT) and the use of high-activity sealed sources (Category 1 and 2). The absence of a certified domestic transport package limits national flexibility, weakens supply chain resilience, and poses long-term risks to safety and security assurance. In line with Wawasan Nuklear Malaysia 2030, which identifies the development of a licensed radioactive source transport container as a key performance indicator, and the National Nuclear Technology Policy (DTNN) 2030, which emphasises localisation, safety, security and safeguards (3S), and industry capability building, Malaysia is motivated to establish its own certified package design. This effort not only addresses pressing domestic needs but also strengthens compliance with IAEA SSR-6 requirements and positions Malaysia to contribute to regional nuclear transport solutions.

This paper aims to present a feasibility study and roadmap that will guide Malaysia in creating its first certified radioactive transport package. The objectives are to establish in-country capability for package development, ensure compliance with IAEA and national regulations, and build long-term capacity for quality assurance, lifecycle management, and re-certification. The study identifies several challenges, including regulatory approval, technical capability gaps, and limited specialised expertise. Nonetheless, Malaysia's readiness is supported by identified stakeholders, including national agencies with suitable testing facilities for drop, leak, thermal, and other qualification assessments, as well as local manufacturers, R&D centres, and Quality Control and Assurance auditors that can play key roles in the development, certification, and life-cycle management process. The project will open opportunities for collaboration with government agencies, research institutions, and international partners to accelerate development and enable technology transfer.

Testing and qualification capacity is available through institutions such as the Standard and Industrial Research Institute of Malaysia (SIRIM), the National Water Research Institute of Malaysia (NAHRIM), and the Malaysian Nuclear Agency (Nuklear Malaysia). These organizations can support critical safety evaluations, including drop, stacking, compression, immersion, and thermal resistance tests. In the future, there may be a need to develop a dedicated Malaysian Standard for quality assurance of transport packages, aligned with ISO/ASME auditing practices, life-cycle management, and re-certification processes.

Malaysia also benefits from the expertise of local research universities and Technical and Vocational Education and Training (TVET) institutions. These universities are recognized for their contributions in design, simulation analysis, and fabrication research, and they represent an important source of innovation and skilled human capital for radioactive transport package development.

From the regulatory side, the Jabatan Tenaga Atom (Atom Malaysia) and the Medical Radiation Regulatory Division (RADIA), Ministry of Health are recognized as competent authorities for package approval and oversight. They maintain close engagement with the IAEA and regional partners, ensuring international alignment. In addition, Malaysia has established competent authorities for each mode of transport. This network of competent authorities reflects Malaysia's readiness to coordinate across multiple modes of transport and to integrate transport safety with emergency preparedness.

In conclusion, this initiative represents Malaysia's strategic move toward self-reliance in the nuclear transport sector. It has the potential to strengthen regional nuclear safety and security transport capacities and capabilities, and to position Malaysia as a credible contributor to international best practices. While the transport package is primarily intended for use within Malaysia and neighbouring regional countries, it fully supports both national policy goals and IAEA objectives. The project will therefore make a significant contribution to the global effort to ensure the safe, secure, and efficient transportation of radioactive materials.

Country or International Organization

Instructions

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