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Radiation Protection Programme in Transport: A Gap Analysis of Annex XIV of BAPETEN Regulation No. 7/2020 and IAEA SSG-86

The transport of radioactive material requires specific regulatory frameworks to address safety and security challenges beyond those of general transport. At the international level, the IAEA establishes requirements through SSR-6 [1] and supporting safety guides [2, 3, 4, 5], including SSG-86 on Radiation Protection Programmes (RPP) for the Transport of Radioactive Material [6]. In Indonesia, the legal basis is provided by Government Regulation No. 58/2015 on Radiation Safety and Security in the Transportation of Radioactive Materials, further detailed in BAPETEN Regulation (BR) No. 7/2020, with Annex XIV outlining the national RPP framework. The five years of implementing BR No. 7/2020 Annex XIV provide a timely opportunity to review and strengthen Indonesia's regulation on radiation protection programmes for the transport of radioactive material.

This study conducts a structured gap analysis between Annex XIV of BR No. 7/2020 and the international guidance in IAEA SSG-86. The analysis focuses on the graded approach, roles and responsibilities, dose assessment, integration with management systems, and practical examples. The findings highlight both areas of alignment and critical gaps. Addressing these gaps will enhance Indonesia's regulatory effectiveness and support future revisions to ensure closer alignment with international standards.

Table 1. Gap Analysis of Annex XIV BR No. 7/2020 and IAEA SSG-86

No Aspect BR No. 7/2020

(Annex XIV) IAEA SSG-86 Identified Gap/ Recommendation

1. Graded approach Dose-based graded approach. Risk-based graded approach covering routine, normal, and accident conditions. Add a risk-based graded approach and explicit coverage of all transport conditions.

2. Roles & Responsibilities Consignor, carrier, and consignee. Includes consignors, carriers, consignees, and port/airport operators. Broaden roles with detailed assignments and coordination.

3. Dose Assessment Package-focused, dose-based. Comprehensive, risk-based; includes workers, public, and optimization. Integrate routine, normal, and accident scenarios; expand worker/public evaluation

4. Management System Not explicitly addressed. Requires integration of RPP into the management system (QA/QC, audits). Embed RPP in the management system.

5. Examples No examples. Provides model RPPs and examples. Add practical examples.

The gaps have clear implications. A dose-based graded approach focuses only on worker thresholds, ignoring public exposure, accident conditions, and optimization. This risks missing high-risk but low-dose scenarios such as contamination events, transit storage, or emergency stops. Limited roles and responsibilities to consignor, carrier, and consignee leave interfaces at ports, airports, warehouses, and subcontractors unregulated. In an accident, responders may not know whose procedures apply. A package-focused dose assessment is not comprehensive, leaving workers and the public insufficiently protected in routine and accident scenarios. This creates risks of over-exposure in foreseeable events such as delayed shipments in public terminals. Without integration into QA/QC, the RPP becomes a static document rather than a system for continuous improvement. The absence of practical examples may also cause uneven RPP implementation across the industry.

Closing these gaps would align Indonesia's framework with IAEA standards while also strengthening regional leadership, driving innovation, promoting continuous improvement, and fostering a stronger safety culture. After five years of implementation, it is timely to revise BR No. 7/2020 by incorporating a risk-based graded approach, expanded roles, comprehensive dose assessment, management system integration, and practical examples to enhance regulation. Beyond regulatory alignment, the findings of this study can guide regulatory revisions, support reviews of current practices under BR No. 7/2020 Annex XIV, and provide a benchmark against IAEA SSG-86.

Keyword: radiation protection programme, gap analysis, transport of radioactive material

Country or International Organization

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