

Design and lessons learned from the consolidation of Co-60 sources and their contribution to updating the Regulations for the Security Transport of Radioactive Materials in Colombia

Colombia gained significant practical experience from two Cobalt-60 source consolidation processes carried out in 2016–2017 and 2020–2021. These operations made it possible to evaluate, under real conditions, the effectiveness of the procedures applied by the regulatory authority, operators, and law enforcement agencies, as well as the application of physical security requirements during transport. Based on the lessons learned, the need for updated transport regulations was identified, given that the country's current regulatory framework, issued in 2004, did not incorporate the most recent international recommendations or establish clear criteria for defining the physical security levels applicable to these activities.

The purpose of the regulatory update was to establish clear, practical, and proportionate criteria for assigning security levels in transport, maintaining consistency with the recommendations of the International Atomic Energy Agency and adapting them to the operational reality of the country. Although IAEA Guide No. 9 (NSS-9) proposes an approach based on activity thresholds (A_2 and D-parameters), Colombia opted for a more practical approach, focusing on the classification of packages according to their type (excepted, BAE, IP, Type A, Type B/C). In this way, the definition of security measures becomes more simple and understandable for shippers, carriers, and the authorities that oversee these operations.

The country's experience in consolidation was key to supporting this decision. Based on this experience, a specific chapter on security was designed within the new transport regulations, explaining the methodology for assigning protection levels and defining measures related to detection, delay, and response. This approach, aligned with the principles of defense in depth and the practical application of the graduated approach, ensures that regulatory requirements are proportionate to the risk and feasible to implement in the field.

The consolidation exercises also showed that organizing security based on the type of package facilitates the standardization of requirements and reduces the administrative burden without compromising physical security. At the same time, it allowed for the identification of additional measures—such as real-time tracking, the use of specialized escorts, and notification and recovery protocols—that are necessary in certain higher-risk scenarios.

Several conclusions can be drawn from this experience: the practice of consolidating sources is a fundamental input of operational experience for adjusting security levels and measures; classification based on packages improves the applicability of the regulation; combining a graduated approach with defense in depth ensures an appropriate balance between proportionality and effectiveness; and successful implementation requires continuous investment in training, interagency exercises, and verification systems. All of this reinforces the importance of having a robust regulatory framework that, in addition to aligning with international recommendations, offers practical solutions that facilitate compliance and strengthen the confidence of institutions and users.

Country or International Organization

Instructions

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