

International Conference on the Safe and Secure Transport of Nuclear and Radioactive Material-2026

Vienna, Austria

Theme:

Legislative and Regulatory Framework for Safe and Secure Transport

Associated Topic:

Development, revision, and implementation of national framework that includes experiences, difficulties faced as well as feedback.

Title:

PNRA regulatory approach for prohibiting the use of 660 Series Gamma Radiographic Projectors in Pakistan

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Synopsis

In Pakistan, 660 series gamma radiographic projectors were used for industrial radiography in non-destructive testing. These devices were designed both as exposure device and transport package. The operational aspects were regulated as per national regulations. For design approval certification, the Certificate of Compliance (CoC) issued by USNRC as Type B(U) packages was accepted by PNRA in accordance with IAEA and PNRA regulations.

In 2009, the manufacturer of 660 series gamma radiographic projectors informed all its owners/users through NRC information notice, that it does not intend to renew the CoC from USNRC for the Model 660 Series of radiographic projectors upon expiry on June 30, 2013. Furthermore, it was informed that manufacturing will be halted after 2013 so the spares will become unavailable. In particular, this model was no longer manufactured and the manufacturer was not willing to repair the shell on packages currently in use or repair the welds. Manufacturer also informed about the inability of this projector to meet the latest ISO standards.

In Pakistan, around sixty licensed projectors were in the possession of licensed NDT firms. Some owners requested PNRA to allow their use even after the expiry of USNRC CoC. PNRA evaluated their requests based on review/regulatory inspections, to verify their shielding and proper functioning and granted authorizations under special arrangements for a limited period. As a part of phase-out strategy, design approval certificates with overpacks were issued, initially for a period of one year up to June 2014, which was extended up to June 2016. Meanwhile, regulatory inspections were conducted which revealed that the use of 660 series gamma projectors can result in over exposure to radiation workers.

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Besides the un-availability of valid design approval certificate, while regulating the 660 series gamma projector some safety significant issues were observed by PNRA. The ageing of the safety components particularly the containment and wear of S-tube require repair and maintenance. Such repair and maintenance service for the projector was unavailable. Further, the spares were also stopped by the manufacturer after 2013. Wear and ageing effect caused unwanted exposure to radiation workers. In 2016, PNRA proposed to conduct destructive and non-destructive testing of these projectors to ensure the integrity of the containment. However, after evaluation, it was concluded that non-destructive testing will not provide strong basis for integrity assessment due to its limitations and destructive testing on a specific projector cannot provide conclusive integrity proof for all projectors. Other countries where these projectors were used as imported devices like Malaysia, India and Brazil also prohibited their use via Information Notices in 2010, 2015 and 2017. Keeping in view, the safety implications and the inability of these projectors to meet latest international design and performance standards, it was proposed that use of these projectors may be prohibited in Pakistan. Accordingly, PNRA issued a regulatory order to prohibit the use of 660 Series Gamma Radiographic Projectors in Pakistan.

This paper will describe the challenges faced, issues highlighted, and regulatory approach adopted by PNRA to abolish the use of 660 series gamma projectors in Pakistan. Furthermore, experience of implementation of regulatory order "Regulatory Order on Prohibition of 660 Series Gamma Radiographic Projectors' Use in Pakistan - (01/2018) will also be discussed.