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New safeguards tools for research reactors

This paper will explore novel methods to strengthen the safeguards approach for new research reactors through early dialogue and collaboration among key players. Interest in this topic was stimulated by the observation that most historical cases of non-compliance have involved research reactors. While the diversion from or misuse of research reactors was often discovered years after the fact and was usually a relatively small part in a broader pattern of non-compliance, these cases are an indication that the safeguards measures applied at these facilities have been insufficient for early detection and deterrence of such noncompliance. This paper argues that it is time to begin a new dialogue among key stakeholders to improve safeguards effectiveness by exploring new opportunities for collaboration among the various stakeholders (state authorities, facility operators, safeguards inspectors, facility designers and safeguards technology developers). Drawing on safeguards approaches commonly applied elsewhere, the paper will consider new ways of monitoring reactor power and neutron fluence, including through the placement of hafnium coupons or wires in the reactor core, which could be sampled and analyzed as a consistency check for operator power declarations. Another potential measure is the use of mailbox declarations for certain reactor operations, such as the movement of fuel, targets and associated containers, combined with random infrequent inspector verification. Environmental sampling could also be used at key points, including hot cells and waste tanks. Applying these tools selectively, in ways that take into account facility-specific features and opportunities for enhanced collaboration with operators and state authorities, could improve effectiveness of safeguards at detecting early indicators of noncompliance without significant impact on safeguards resources or facility operations.

Which "Key Question" does your Abstract address?

NEW3.1

Which alternative "Key Question" does your Abstract address? (if any)

SGI1.1

Topics

NEW3

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