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Nuclear Security in a New Era of Nuclear Energy

Countries around the world are looking towards nuclear power and advanced nuclear technologies as an effective means of decarbonization. These advanced reactor designs deviate significantly from the existing generation of light water reactors, including in the incorporation of passive safety systems, flexible siting options, cogeneration, and modular construction. These new characteristics introduce increased overlap with safety considerations, thereby necessitating additional analysis from the 2S (security and safety) perspective. These unique characteristics may challenge existing security paradigms and infrastructures globally, and thus require novel techniques and perspectives on nuclear security to mitigate the risks posed by theft and sabotage. Regulators in the countries looking to acquire this technology may be faced with challenges that go beyond their current resources. This underscores the importance of considering nuclear security early in the decision process by governments. The researchers designing new technologies may be isolated from the operational experience and knowledge. Stakeholders across the supply chain from designers, vendors, operators, and regulators should coordinate better and often during the entire lifecycle to ensure the best possible outcomes. New nuclear requires a paradigm shift in how security is integrated into the dialogue. By requiring the consideration of security early in the design process, or security by design (SeBD), regulators and governments can have more confidence that the technologies they procure or authorize are sufficiently resilient against the new threat environments they may face, and ensure energy security, SeBD combined with economic analyses can help ensure protection strategies for systems are tailored to be optimally effective at lower costs. The responsibility of integrating SeBD doesn't fall to a single stakeholder, the developer, operator, and regulator have critical roles to play.

Country OR International Organization

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and Safeguards Interfaces related to SMRs