Contribution ID: **301** Type: **Oral**

NRC Regulatory Efforts for Cybersecurity of Small Modular Reactors

The U.S. Nuclear Regulatory Commission, supported by cybersecurity experts from the national laboratories, has proposed a technology-inclusive, performance-based, and risk-informed cybersecurity regulatory framework for advanced reactor operators including Small Modular Reactors (SMRs). This regulatory framework aims to provide a process that accounts for the differing risk levels within SMR technologies, while also providing reasonable assurance of adequate protection of public health and safety, promoting the common defense and security, and protecting the environment. A key outcome of the regulatory framework is to provide an approach that would allow for the development and implementation of a cybersecurity program to meet demands for protection against the unacceptable consequences from a cyber-attack.

The paper will discuss and analyze some key assumptions and trends relevant to cybersecurity of SMRs. First, the NRC expects SMRs to have increased reliance on digital systems, emerging technologies, passive safety features, and other novel design features. Additionally, designers are planning novel use cases, such as remote and autonomous operations, which demand reassessment of the applicability of existing paradigms such as network isolation, common in the existing power reactor fleet. Finally, harmonization of international standards and approaches may support more sophisticated security concepts, including security by design, customized control catalogs, and more performance-based objectives.

Country OR International Organization

U.S. Nuclear Regulatory Commission

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Track Classification: Topical Group C: Safety, Security and Safeguards: Track 11: Security of SMR: Physical Protection and Computer Security