

A review on Security in Small Modular Reactors and Micro Nuclear Reactors

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Abstract

Small Modular Reactors (SMRs) constitute an option for generating electricity and processing heat from nuclear energy, with advantages over large-scale nuclear power plants such as flexibility in location, improved safety, and reduced construction time. SMRs can also be designed as microreactors, aiming at relatively low energy production for industrial facilities, remote off-grid locations, military installations, and areas recovering from natural disasters. Due to their reduced dimensions and the market trend towards their large-scale use, additional security and proliferation aspects need to be adequately evaluated. As physical security is a critical consideration for SMRs, due to the protection of reactors, people, and the environment against a variety of potential threats, the objective of this study is to analyze the existing literature, identifying patterns, gaps, and trends to provide insights into the challenges and strategies related to the physical security of these emerging technologies.