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Securing the Nuclear Renaissance: An Assessment of Nuclear Security Requirements for Marine based Small Modular Reactors (SMRs)

In view of increasing global energy demands and the dreadful environmental impact of fossil fuel consumption, there is a renewed focus on nuclear energy as an alternative source of clean energy. While the traditional nuclear power plants are here to stay at least for the foreseeable future, the new nuclear renaissance is paving the way for smarter, cheaper, and innovative methods for achieving energy sufficiency in the form of small modular reactors (SMRs). With almost 80 under consideration SMR designs globally, this new technology has a promising future. While the new SMR designs, both land-based and marine-based, are poised to have inbuilt safety and security features, this innovation will require a review and upgradation of existing nuclear security rules and regulations. In that regard, this study seeks to evaluate current nuclear security laws and regulations concerning the marine-based SMRs also called floating nuclear power plants (FNPP). The FNPP-SMRs pose a different set of security concerns as they are likely to move not just across territorial but international waters. This analysis will help identify the nuclear security gaps and propose potential pathways to bridge those gaps for secure operations of FNPP-SMRs and strengthen the global nuclear security regime.

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Confirm that the work is original and has not been published anywhere else

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