



Contribution ID: 198

Type: Oral

Systematic proliferation resistance analysis of Small Modular Reactor designs

Small Modular Reactors (SMRs) are defined by the IAEA as nuclear reactors with a power capacity up to 300 MW(e). More than 80 SMRs designs have been proposed by different vendors and the IAEA Advanced Reactors Information System (ARIS) database contains information about 49 SMRs designs.

Starting from the ARIS database, we conducted a systematic proliferation resistance analysis of a set of SMRs designs using the Proliferation Resistance and Physical Protection (PR&PP) methodology. Only SMRs with a detailed design were considered for the analysis to ensure that enough safeguards-relevant information is available.

Each selected SMR design was evaluated with the PR&PP methodology in terms of proliferation technical difficulty, cost, time, material type, and detection resource efficiency. In addition, a comparison between SMR designs and current light water power reactors was made in term of safeguards inspection effort. The PR&PP analysis showed that most of the SMR designs achieve a proliferation resistance similar to current light water power reactors, although some points of attention emerge for some technology.

Country OR International Organization

Belgium

Email address

rrossa@sckcen.be

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

YES

Authors: BORELLA, Alessandro (SCK-CEN); GERARD, Damien (ENGIE group); MAENHOUT, Greet (Ghent University); VAN DER MEER, Klaas (SCK.CEN); VANDERHAEGEN, Matthias (Federal Agency Nuclear Control/University of Ghent); ROSSA, Riccardo (SCK-CEN)

Presenter: ROSSA, Riccardo (SCK-CEN)

Track Classification: Topical Group C: Safety, Security and Safeguards: Track 12: Safeguards for SMRs