Contribution ID: **154** Type: **Oral**

Approaches for Comprehensive Safety and Digital Risk Management for Advanced Nuclear Technology and Small Modular Reactors

Small Modular Reactor designs are likely to rely on complex digital technology novel to nuclear industry applications while also leveraging passive systems and safety design simplification. The result of current approaches may lead to a safety-driven system design that lacks demonstrated robustness in the event of cyber-attacks against its digital equipment. Information and computer security should be an integral part of engineering and operational processes. Current safety and security thinking does not encourage sufficient interaction. Teams are often separate and management structures reinforce this separation. This paper provides a case for cybersecurity related safety and security requirements to be considered together throughout design, licensing, and operation. Safety envelope boundaries may be expressed using many variables and suitably defined system theoretic models can be used to alert whether due to faults, failures or malicious action. This provides a unifying "top down"framework for digital systems safety and and approaches supporting and implementing safety and security requirements. This paper will identify existing work supporting this closer safety/cybersecurity relationship. However, new tools, techniques, and ways of working need developing to enable SMR designers, regulators and operators to employ complex digital technology in a way that remains both safe and secure.

Country OR International Organization

Idaho National Laboratory

Email address

joseph.mahanes@inl.gov

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

YES

Authors: MAHANES, Joseph; Mr ST. JOHN-GREEN, Michael; HEWES, Mitchell (IAEA); ANDERSON, Robert (Idaho National Laboratory)

Presenter: ANDERSON, Robert (Idaho National Laboratory)

Track Classification: Topical Group C: Safety, Security and Safeguards: Track 10: Safety, Security and Safeguards Interfaces related to SMRs