



Department of
Engineering Physics
UNIVERSITY OF WISCONSIN-MADISON

INSTITUTE FOR
NUCLEAR
ENERGY SYSTEMS

Presents:

Joe Rivers
Rivers Security Services, LLC



A Bit about Nuclear Security and How it is Risk-Informed

Abstract: The talk will provide a brief overview of nuclear security, with some of the history and what are the basic building blocks. It will then progress into a discussion of how risk information is used in nuclear security. This will include developing graded security programs based on the potential consequence resulting from adversary actions. It will present an overview of vital area identification, which uses safety and security risk information to identify the areas that must be protected in a nuclear power plant. It will provide insights into how various forms of special nuclear material may have different measures of attractiveness to an adversary and how those insights are factored into security programs. It will provide a discussion of vulnerability assessments, to include a discussion of modeling and simulation that has many relationships to probabilistic risk assessments. Finally, the talk will provide a discussion of whether and how the likelihood of attack can be quantified. This was the topic of a recent workshop that hoped to provide a path to a potential quantification approach. This would allow safety and security risks to be compared in some fashion, a challenge today because security focuses on conditional risk, whereas safety focuses on risk.

Biography: Joe Rivers has over 35 years of experience in nuclear safeguards and security. He has decades of experience in both the DOE and NRC environments. His areas of interest include risk-informing security, vulnerability assessments, material attractiveness, unmanned aerial vehicles (UAVs), advanced and small modular reactors, and radiological security. He has extensive experience both domestically and internationally.

Joe recently retired from the NRC where he served as the Senior Level Advisor on Security, serving as the lead technical expert on nuclear security. Upon retirement, he established Rivers Security Services, LLC to perform consulting services in support of Sandia National Laboratories, the NNSA International Nuclear Security Office, USA Nuclear, WINS, and X-Energy.

He is currently working on projects related to unmanned aerial vehicles, advanced reactors, research reactors, decommissioning, and reactor sabotage. He is also developing the security program for a new fuel fabrication facility that will produce high-assay low-enriched uranium fuel for a variety of advanced reactor designs.

Joe has led many complex technical projects over the years. For the NRC, he developed a new approach to categorize special nuclear material, taking into account the attractiveness of the material to adversaries, an assessment of the vulnerability of commercial nuclear facilities to UAV attacks, development of classification guidance, developing an approach to making inimicality determinations, an assessment of the security of chemicals at nuclear facilities, and developed a number of initiatives to support risk-informing security. While at DOE and as a Chief Scientist at SAIC supporting DOE, his activities included a review of the DOE Graded Safeguards Table, readiness planning for treaty implementation in the nuclear weapons complex, and material control and accountability.

In support of international initiatives, Joe supported IAEA IPPAS missions and international training courses. He chaired an IAEA Coordinated Research Project on Nuclear Security Assessment Methodologies (NUSAM) and served on numerous consultants groups. Also, Joe

represented the US Government at meetings with senior officials of many governments around the world.

Joe received a BS in Mathematics from Rensselaer Polytechnic Institute and studied Statistics in graduate school at the Pennsylvania State University. Joe is a Fellow of the Institute of Nuclear Materials Management (INMM) and serves as Chair of its Nuclear Security and Physical Protection Technical Division. Through the INMM, he has organized and conducted numerous workshops on risk-informing security.

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