PURDUE UNIVERSITY | School of Nuclear Engineering

Nuclear Engineering Seminar

Dr. Gerhard Strydom, PhD.,

National Technical Director, DOE Advanced Reactor Technology Gas-Cooled Reactors program

Wednesday, October 29, 2025
3:30 pm | WTHR 200

HTGR R&D and Deployment in the US: Status and Challenges

Abstract

The Department of Energy (DOE) has been supporting R&D on TRISO fuel testing, graphite qualification and High Temperature Gas-Cooled Reactor (HTGR) core simulation since 2003, and the total investment to date is more than $1B. The presentation will provide the latest status of the federal support for HTGR R&D at the US National Laboratories, in addition to an overview of the current commercial HTGR projects and their deployment timelines. Remaining challenges, such as a mature supply chain, fuel qualification for new TRISO fuel forms and the importance of HTGR code validation will also be addressed.

Gerhard Strydom is the National Technical Director for the Department of Energy's Advanced Reactor Technology Gas-Cooled Reactors program, and a Directorate Fellow at the Idaho National Laboratory (INL). He is responsible for overseeing the graphite qualification program at INL, in addition to the activities on high-temperature alloys and High Temperature Gas-Cooled Reactor simulation method development and validation. He has represented DOE on the IAEA HTGR Technical Working Group, the Generation-IV Forum Expert Group, and completed a 4-year term as Chair of the GIF HTGR System Steering Committee.

His primary technical focus areas are coupled neutronics and thermal fluid HTGR analysis, and specifically uncertainty propagation from lattice to transient simulations. He led several international reactor physics benchmarks in the last 15 years, including the IAEA Coordinated Research Program on HTGR uncertainties, the OECD/NEA transient benchmark on the 350 MW prismatic Modular High Temperature Reactor, as well as the NEA PBMR-400 benchmark.

In addition to his NTD role, he was appointed as manager of the Advanced Reactor Technology and Design Department at INL. Prior to joining INL, Dr. Strydom worked at the Pebble Bed Modular Reactor company, where he led the PBMR core design and accident analysis team as the primary safety case transient analyst. He is the author of more than 100 technical publications, including 67 journal and conference papers. He received his Ph.D. on the development of a multi-phase and multi-physics uncertainty assessment methodology for prismatic HTGRs.