Department of Engineering Physics
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Presents:

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Versatile Test Reactor Overview

Abstract: For U.S. to regain the technology and industrial leadership in the next few decades, the commercialization of advanced reactors in the 2030-2040 timeframe is critical. Many papers have been written and many workshops have been organized to articulate the national security, economic and environmental benefits of an accelerated advanced reactor development and deployment strategy. In summary, the vision of the nuclear energy enterprise (DOE, industry including vendors and utilities, and NRC) is to establish a nuclear energy research, development, demonstration, and deployment (RDD&D) strategy to simultaneously achieve three strategic goals:

- Re-establishing and maintaining the U.S. scientific and technological leadership;
- Re-establishing the U.S. industrial leadership; and
- Enabling the optimized use of nuclear energy for domestic markets.

Within this overall vision, a major initiative to re-establish and maintain and U.S. scientific and technological leadership in the area of advanced reactors is the design and construction of a Versatile Test Reactor (VTR), which would also enable U.S. industrial leadership in the long-term. The mission of the Versatile Test Reactor (VTR) program is to provide leading edge capability for accelerated testing and qualification of advanced fuels and materials enabling the U.S. to regain and sustain technology leadership in the area of advanced reactor systems.

Based on requirements defined by the various commercial entities developing commercial fast reactors (e.g. sodium-cooled, lead- or lead-bismuth cooled, gas-cooled and molten salt fueled reactors), pre-conceptual/conceptual design studies are being performed for VTR. The present studies are focusing on a sodium-cooled reactor with a size ≤ 300 MWth that uses a metallic alloy fuel. However, the design includes capabilities for testing not only fuels and material for sodium-cooled reactors but also for other fast reactor technologies.

This talk provides an overview of the design status, experimental capabilities and overall plan to achieve the mission.

***Biography*:** Dr. Kemal Pasamehmetoglu has been with the Idaho National Laboratory (INL) since 2004, currently serving as the Executive Director for the Versatile Test Reactor (VTR). Previously he served as the Associate Laboratory Director for the Nuclear Science & Technology Directorate between 2012 and 2017. He was instrumental in the launch of the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative and initially served as the director for GAIN after its inception. Kemal also served as the national technical director (NTD) for Advanced Fuels Research and Development in the Advanced Fuel Cycle Initiative while also serving as the Nuclear Fuels and Materials Division Director at INL between 2005 and 2012. During his tenure as a fuels and materials division director and as a NTD he has focused on transforming nuclear fuels research and development capabilities in the nation and at INL into world-leading endeavors. Prior to his time at INL, he held senior technical leadership positions at Los Alamos National Laboratory where he worked between 1986 and 2004. He started his career working on light-water reactor safety research. He holds a doctorate in mechanical engineering from the University of Central Florida and has more than 30 years of research and engineering experience within the Department of Energy (DOE) National Laboratory system.

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