

Nuclear Engineering Seminar

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Wednesday, February 26, 2020

3:30pm | PHYS 112



“Optimizing Performance, Safety, and Proliferation Resistance of Research and Test Reactors “

Abstract

The control of weapons-usable fissile material is fundamental to global efforts to avoid proliferation of nuclear weapons, whether by state or non-state actors. Since 1978, the U.S. Reactor Conversion Program has pursued the minimization, and to the extent possible the elimination, of Highly Enriched Uranium (HEU) material from civilian use. The program has accomplished conversion of 71 research reactors, including the PUR-1, from the use of HEU to Low Enriched Uranium (LEU). Those conversions have completed the scope of HEU minimization in 33 countries, but research reactors continue to use HEU in the US and 15 other countries.

The NNSA Reactor Conversion Program remains dedicated to development and deployment of the high density fuels that enable conversion while preserving experimental capabilities. Argonne continues their leadership role in conversion, together with 9 other national laboratories and international partners. During FY20, the scope of active M3 conversion projects led by Argonne’s Research and Test Reactors Department has included reactors in 11 countries (US, Belgium, France, Germany, Italy, Kazakhstan, China, and Japan. IAEA engagement augments direct interaction for projects in Iran, Syria, and Pakistan.)

Dr. Stevens’ seminar will review the technological advancements in fuel, design and safety analysis modeling capabilities, and multi-national collaborations that have allowed the successes to date and that are being extended to remaining scope. The new PRO-Core initiative to assure that future research and test reactors deploy LEU in a manner that maximizes proliferation resistance will also be introduced.

Dr. John G. Stevens is a Senior Nuclear Engineer and leads the Reactor Material Management Programs in the Nuclear Science and Engineering Division. He is a reactor physicist with over 30 years of engineering experience. He currently has the role of International Reactor Conversion Technical Lead within the NNSA Material Management & Minimization (M3) Reactor Conversion Program. John also provides programmatic oversight of Mo-99 conversion and non-HEU domestic production development activities at Argonne.

Dr. Stevens completed his Purdue Ph.D. as a Department of Energy Fellow in 1995.

Prior to joining Argonne in 2005, he worked for Studsvik Scandpower, Inc., Westinghouse Nuclear Fuels Division and the French Center for Nuclear Studies at Cadarache.

Dr. Stevens has been a member of the American Nuclear Society since 1985. He has been a member of the Institute for Operations Research and the Management Sciences since 1995. He has been the recipient of three U.S. Secretary of Energy Achievement Awards.