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Why we need nuclear power plants

Bahman Zohuri
University of New Mexico, Mexico

The major growth in the electricity production industry in the last 30 years has centered on the expansion of natural gas power plants based on gas turbine cycles. The most popular extension of the simple Brayton gas turbine has been the combined cycle power plant with the Air-Brayton cycle serving as the topping cycle and the Steam-Rankine cycle serving as the bottoming cycle for new generation of nuclear power plants that are known as GEN-IV. The Air-Brayton cycle is an open-air cycle and the Steam-Rankine cycle is a closed cycle. The air-Brayton cycle for a natural gas driven power plant must be an open cycle, where the air is drawn in from the environment and exhausted with the products of combustion to the environment. This technique is suggested as an innovative approach to GEN-IV nuclear power plants in form and type of Small Modular Reactors (SMRs). The hot exhaust from the Air-Brayton cycle passes through a Heat Recovery Steam Generator (HSRG) prior to exhausting to the environment in a combined cycle. The HRSG serves the same purpose as a boiler for the conventional Steam-Rankine cycle.

Biography

Bahman Zohuri is currently at the University of New Mexico as Associate Research Professor and Consultant at Sandia National Lab as well as Galaxy Advanced Engineering, Inc. a consulting company that he stared himself in 1991 when he left both semiconductor and defense industries after many years working as a chief scientist. After graduating from University of Illinois in field of Physics and Applied Mathematics, he joined Westinghouse Electric Corporation where he performed thermal hydraulic analysis and natural circulation for Inherent Shutdown Heat Removal System (ISHRS) in the core of a Liquid Metal Fast Breeder Reactor (LMFBR) as a secondary fully inherent shut system for secondary loop heat exchange. All these designs were, used for Nuclear Safety and Reliability Engineering for Self-Actuated Shutdown System. He designed the Mercury Heat Pipe and Electromagnetic Pumps for Large Pool Concepts of LMFBR for heat rejection purpose for this reactor around 1978 where he received a patent for it. He then was, transferred to defense division of Westinghouse later, where he was responsible for the dynamic analysis and method of launch and handling of MX missile out of canister. He has later on joined Lockheed and Rockwell International working on Satellite system for SDI as well as working and developing sensor system on board for remote sensing as well GIS. He later on was a consultant at Sandia National Laboratory after leaving United States Navy. He earned his first Bachelor's in Applied Mathematics and his second one in Physics along with his Master's degrees in Physics from the University of Illinois and his second Master degree in Mechanical Engineering as well as his Doctorate in Nuclear Engineering from University of New Mexico. He has been, awarded three patents, and has published 32 textbooks and numerous other journal publications. Recently he has been involved with Cloud Computation, Data warehousing, and Data Mining using Fuzzy and Boolean logic. He has published more than 25 papers in reputed journals and has been serving as an editorial board member of repute.

bahmanz@aol.com

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