Nuclear Engineering Seminar

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How do we capture the risk of a plant?

Abstract

The energy issue is becoming very serious for sustaining human society. On the other hand, after the Fukushima accident in 2011, safety has become the more crucial factor of peaceful utilization of nuclear power. Based on the lessons learned, the active application of risk information has been emphasized, and it actually plays more and more important role in recent safety issues. We are aiming at new nuclear power plant design of which risk is practically negligible, but there are challenges to capture the realistic risk of the plant.

This talk is to give an overview of risk assessment framework, to discuss the challenges of current techniques, and to provide illustrative examples. As an example of dynamic risk assessment, the risk analysis for spent fuel transportation and interim storage will be illustrated. It focuses on three different kinds of accident: aircraft crash on interim storage, fuel dropping accident during onsite transportation, and maritime transportation accidents.

Dr. Kang is an Associate Professor of Nuclear Engineering Program at Rensselaer Polytechnic Institute (RPI). Before joining to RPI, he was an Associate Professor at the Department of Nuclear and Quantum Engineering at Korea Advanced Institute of Science and Technology (KAIST).

Dr. Kang's research focus lies in innovations of risk assessment of safety-critical systems, intrinsically safe nuclear power, the intelligence of control and protection, and design and evaluation of emergency procedure. Dr. Kang' research group in Nuclear Plant Reliability and Information Laboratory develops advanced methods for risk analysis. Dynamic risk assessment and digital system reliability are current funded research topics.

He received the Ph.D. in 1999 in nuclear engineering from KAIST. After his Ph.D., he had worked for the probabilistic risk assessment team of the Korea Atomic Energy Research Institute (KAERI) as a senior researcher. In 2011 and 2012, he also taught in Khalifa University in UAE.

Dr. Kang has authored more than 80 peer-reviewed journal articles and 150 conference presentations. He advised 17 graduate students for Ph.D. or M.S. in KAIST (Korea) and Khalifa University (UAE). Currently, he advises 4 Ph.D. students at RPI and teaches reactor reliability, nuclear power system engineering, and modeling & analysis of