

## **EXECUTIVE SUMMARY**

Financial support is requested through the Faculty Development Grant program for the **“Development of a Nuclear Thermal-hydraulics and Safety Research Program”** in the newly established Energy Institute at the City University of New York (CUNY). The Energy Institute focuses on advanced electricity generation and storage technologies, in particular, advanced nuclear reactors which will be constructed in the US over the next twenty to thirty years. The Energy Institute is setting up a Nuclear Thermal-hydraulics and Safety Research Laboratory in the Grove School of Engineering at the City College of New York (CCNY). The Faculty Development Grant will be used by Dr. Taehun Lee, a tenure-track Assistant Professor in the Department of Mechanical Engineering at CCNY to develop a research program on advanced analyses of reactor thermal-hydraulics and safety in collaboration with Prof. Sanjoy Banerjee ([sanjoy.banerjee@ccny.cuny.edu](mailto:sanjoy.banerjee@ccny.cuny.edu)).

A total funding of \$448,978 over three years is requested from NRC to financially support Prof. Lee’s research on nuclear reactor thermal-hydraulics and safety. Prof. Lee and his student will conduct numerical and experimental investigations of thermal-hydraulics problems relevant to advanced reactor design, operation and safety. As CCNY is a minority and a Hispanic Serving Institution, the proposed development of the nuclear research program by Prof. Lee will provide minority students with the knowledge, experience and skills needed to enter careers in the nuclear power industry. Professor Lee has expertise in numerical analyses of flow phenomena using advanced simulation models, such as unstructured Lattice Boltzmann and Diffuse Interface methods. He will investigate the Departure from Nucleate Boiling (DNB), liquid film dryout and Critical Heat Flux (CHF) phenomena in fuel channels, and modeling of developing two-phase flows in water-cooled nuclear reactors. He will also develop an experimental research program in close collaboration with Prof. Kawaji, who has been recently recruited from Canada to conduct thermal-hydraulics research at CCNY.