

A Research Overview for Developing Enhanced Reactor Operation Strategy Through Improved Sensing and Control at NPPs

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Abstract

The Chosun University (CU), the Korea Atomic Energy Research Institute (KAERI) and the Cheju National University (CNU), the Oak Ridge National Laboratory (ORNL) and the Ohio State University (OSU) collaborate to examine, develop, and demonstrate how modern sensing and control can improve the operation of nuclear power plants.

The project consists of three tasks. The objective of the first task is to evaluate the basis for current reactor operation strategies including assessment of the state-of-the-art for primary system measurement, investigation of the effects of measurements limitations on operational performances of existing NPPs, and identification of potential operational/safety improvements resulting from improved measurement and control. The objective of the second task is to develop three advanced sensors; a solid-state in-core flux monitor, a Johnson noise thermometer and a magnetic flow meter. The objective of the third task is to take advantage of the benefits of improved sensors by devising advanced reactor operational strategies that optimize core performance and permit reduced operational margins.