

# ***INTERNATIONAL NUCLEAR ENERGY RESEARCH INITIATIVE***

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## **ZPPR-15 and BFS Critical Experiments Analysis for Generation of Physics Validation Database of Metallic-Fueled Fast Reactor Systems**

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**Collaborators:** None

**Project End Date:** September 2012

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### **Project Abstract**

Three-year collaboration is proposed between ANL and KAERI to generate a physics validation database of integral type experiments for metallic fueled fast reactor systems. The objective of the proposed project is to archive and evaluate the integral experiment data, analyze the experiments, and prepare detailed computational models to be used for validating the modern suites of fast reactor design analysis tools which are under development at ANL and KAERI.

A series of mockup experiments for a 330-MWe Integral Fast Reactor (IFR) at ANL under the ZPPR-15 Program, also known as the IFR Benchmark Physics Test Program will be retrieved and analyzed in this project. The BFS-73-1 and BFS-75-1 experiments of KAERI carried out as the mockup experiment of KALIMER-150 at the Russian BFS-1 facility will be also compiled in this project.

ANL will participate in KAERI's transuranics (TRU) burner physics experiments which are planned to be performed at the BFS-2 facility in FY 2010 to validate the physics performance of its metal-fueled TRU burner reactor design and design analysis tools. This burner reactor physics experiment data will be a valuable addition to the existing experiment database for breeder reactors.

The principal outcomes of this project for the ZPPR-15, BFS-73-1, BFS-75-1 experiments will include

- compiled sets of measured physics parameters and uncertainties
- consistent sets of as-built Monte Carlo models
- a mock-up of a 300-MWe-rated TRU burner reactor

Since both the United States and the Republic of Korea are interested in a TRU-burning option using metal-fueled fast reactors, it would be mutually beneficial to generate the physics

validation database of metal-fueled fast reactors using the ZPPR-15 experiments and the planned TRU burner physics experiments at the BFS-2 facility.