

# International Nuclear Energy Research Initiative

## U.S. DEPARTMENT OF ENERGY INTERNATIONAL NUCLEAR ENERGY RESEARCH INITIATIVE DOE/Canada

### ABSTRACT

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#### Thermal-Hydraulic Benchmark Studies for SCWR Safety

**Principal Investigator (U.S.):** J. Buongiorno and D. M. McEligot, Idaho National Engineering and Environmental Laboratory (INEEL)

**Project Number:** 2004-006-C

**Project Start Date:** October 2004

**Principal Investigator (Canada):** H. Khartabil, Atomic Energy Canada Ltd. (AECL)

**Project End Date:** September 2007

**Collaborators:** Ecole Polytechnique de Montreal, Iowa State University, University of Manitoba, University of Wisconsin

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The objectives of this project are to address the critical issue of measuring heat transfer to supercritical water at prototypical SCWR conditions and to develop the tools to predict the SCWR thermal behavior. In addition to actual supercritical water, surrogate fluids at supercritical conditions will be used because: 1) valuable insight of the physical phenomena can be gained with these fluids and 2) some existing facilities use such fluids, which in general have lower critical pressure and temperature, thus affording significant cost and time savings in constructing and operating experimental facilities. The unique INEEL Matched-Index-of-Refractive (MIR) flow system will also be used for benchmark measurements of velocity and turbulence fields around the complex geometries involved. U. S. activities will start in FY 05. However, this proposal currently falls under Generation IV Work Package, I0301J01. The GIF SCWR Steering Committee believes that the above objectives can be achieved by means of an integrated international project involving multiple GIF countries. This U.S.-Canada I-NERI project is intended to be only a portion of that GIF project, which could eventually involve Korea, Japan and the European Union, also. This proposal does not cover the full scope of the GIF project.

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