INTERNATIONAL NUCLEAR ENERGY RESEARCH INITIATIVE

Evaluation and Demonstration of Advanced Power Conversion and Hydrogen Generation Technologies for Low Emission Nuclear, Fossil and Renewable Energy Sources

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Collaborator: None

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Project Abstract

Under the Generation IV program, the research and development of advanced power conversion cycles using the supercritical CO_2 is underway at Sandia National Laboratories (SNL). Under the Clean Electric Power Generation program, evaluation of these advanced cycles and processes for application in near-zero emissions fossil fueled plants is underway at CANMET Energy Technology Centre-Ottawa (CETC-O). In addition, SNL is investigating the use of thermochemical processes for hydrogen production from high temperature nuclear energy, while CETCO is evaluating the use of the same processes in high temperature fossil fuel combustion systems for production of hydrogen and oxygen.

This project comprises a collaborative research program between SNL and CETC-O to conduct research on evaluating crosscutting advanced power and hydrogen generation technologies for low-emission nuclear, fossil and renewable energy applications. Based on these evaluations, researchers will select the most promising power conversion applications and technologies, develop a small scale integrated demonstration system, and conduct experiments to demonstrate the key technologies. The linking of synergistic nuclear developments with fossil fuel applications can lead to an overall accelerated technology development. This R&D plan is focused on assessing two cross cutting technologies (the S-CO_2 closed Brayton cycle, and thermo-chemical processes) for their possible integration with advanced nuclear and fossil energy conversion processes.