

# 3D Multiphysics Analyses to Support Low Enriched Uranium (LEU) Conversion of HFIR

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## Abstract

Engineering design studies of the feasibility of conversion of the High Flux Isotope Reactor (HFIR) from high-enriched uranium to low-enriched uranium (LEU) fuel are ongoing at Oak Ridge National Laboratory as part of an effort sponsored by the U.S. Department of Energy's Global Threat Reduction Initiative Reduced Enrichment for Research and Test Reactors program. COMSOL Multiphysics® models are developed for the steady-state nominal operating conditions of HFIR at the beginning and end of the reactor cycle; the following multiple physics were included in the analyses: heat conduction within the fuel plate, conjugate heat transfer from the fuel plate to the coolant channel, Reynolds averaged Navier-Stokes turbulence model for flow in the coolant channel, and thermal-expansion physics for the fuel plate.