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**Accident Analyses for the Conversion of the University of Missouri
Research Reactor from Highly-Enriched to
Low-Enriched Uranium Fuel**

L. Foyto, K. Kutikkad, J. C. McKibben and N. Peters
University of Missouri-Columbia Research Reactor
1513 Research Park Drive, Columbia, Missouri 65211 – USA

J. Stillman, E. Feldman and E. Wilson
Argonne National Laboratory
9700 South Cass Avenue, Argonne, Illinois 60439 – USA

ABSTRACT

The University of Missouri Research Reactor (MURR[®]) is one of five U.S. high performance research and test reactors that are actively collaborating with the U.S. National Nuclear Security Administration (NNSA) Office of Material Management and Minimization (M³) Reduced Enrichment for Research and Test Reactors (RERTR) Program to find a suitable low-enriched uranium (LEU) fuel replacement for the currently required highly-enriched uranium (HEU) fuel. Analyses of accident scenarios for a proposed core loaded with U-10Mo monolithic LEU fuel have been completed. The models include both fresh and irradiated fuel assemblies. Results for postulated scenarios of a positive reactivity insertion accident (RIA), a loss of coolant accident (LOCA), a loss of flow accident (LOFA), and accidents with radiological consequences including the maximum hypothetical and fuel handling accidents (MHA and FHA) are discussed in this paper. Furthermore, in some cases, a series of branch cases to evaluate the impact of the uncertainties in core operating conditions or fuel thermo-physical properties that may affect the severity of the accidents are also considered at conditions up to and including Limiting Safety System Setting (LSSS) conditions. All accident scenarios demonstrate an acceptable margin to potential fuel damage or acceptable dose consequences in the cases of the MHA and FHA.