

**RERTR 2016 - 37th INTERNATIONAL MEETING ON
REDUCED ENRICHMENT FOR RESEARCH AND TEST REACTORS**

**OCTOBER 23-27, 2016
RADISSON BLU ASTRID HOTEL
ANTWERP, BELGIUM**

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

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, D. Jaluvka, 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) 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 updated based on requests for additional information from the U.S. Nuclear Regulatory Commission (NRC) during relicensing of MURR. In the update, analyses of severe accidents are assumed to be initiated from more severe conditions, in addition to the most limiting extremes of normal operation. The models include both fresh and irradiated fuel assemblies and the associated fresh and irradiated fuel thermo-physical properties, which may affect the severity of the accidents. Results for postulated positive reactivity insertion accidents (RIAs), loss of coolant accidents (LOCAs), and loss of flow accidents (LOFAs) are discussed. Also, analyses of accidents with radiological consequences, including the maximum hypothetical and fuel handling accidents (MHA and FHA), have been revised and are discussed. All accident scenarios demonstrate an acceptable margin to potential fuel damage or acceptable dose consequences in the case of the MHA and FHA. These accident analyses, along with previously completed steady-state safety calculations, are being incorporated into a Preliminary Safety Analysis Report (PSAR), which is scheduled to be submitted to the NRC in 2017.