

**RERTR 2015 – 36th INTERNATIONAL MEETING ON
REDUCED ENRICHMENT FOR RESEARCH AND TEST REACTORS**

**OCTOBER 11-14, 2015
THE PLAZA HOTEL
SEOUL, SOUTH KOREA**

**U.S. High Performance Research Reactor
LEU Fuel Element Designs**

**E.H. Wilson, A. Bergeron, and J. Stillman
GTRI Program, Nuclear Engineering Division
Argonne National Laboratory
9700 South Cass Ave, Argonne, IL 60430 – USA**

ABSTRACT

Based on favorable irradiation behavior, U-10Mo monolithic fuel has been selected for qualification in the LEU conversion of the U.S. high performance research reactors (US HPRR). Irradiation behavior has previously been demonstrated in test plate geometry across a range of irradiation conditions similar to those found in the current US HPRR. Based on the initial success of this fuel system, LEU fuel element designs of the US HPRR LEU conversion cores have been optimized by each reactor facility to allow the reactors to meet mission, operational, and safety basis requirements using monolithic LEU fuel. In order to allow a fabrication process selection, a mini-plate test, MP-1, is planned to test relevant fuel performance parameters across a range of reactor-specific proposed plate geometries and plate histories. In a working group effort, reactor core designers and safety analysts, the fuel developers, and fabrication experts have defined and represented the range of limiting plate geometries and irradiation histories in the US HPRR for MP-1 and subsequent mini-plate and full-size plate irradiation testing.