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Comparison of Properties and Fuel Performance Data Presented in the Preliminary UMo Report with Current US High Performance Design Basis Analyses

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ABSTRACT

Ongoing efforts to convert research and test reactors (RTR) to operate with low-enriched uranium (LEU) rather than high-enriched uranium (HEU) fuel require analysis for each US high-performance research reactor (USHPRR) to be converted with LEU U-10Mo monolithic alloy fuel. A report reviewing the technical basis for properties and fuel performance data used in HEU to LEU conversion analyses for U-10Mo monolithic alloy fuel was recently completed. In addition, the Preliminary Report on U-Mo Monolithic Fuel for Research Reactors was subsequently issued. This report is a comprehensive compendium of the preliminary information, presented in the format to allow the USHPRR to prepare future licensing information for U-Mo monolithic fuel. Presented here is a comparison of recommendations for materials properties and fuel performance data in each of these reports. In general, the recommendations are in agreement with safety basis work conducted over the past decade for both materials properties and fuel performance data. Although these reports precede fuel qualification tests specific to individual fuel element designs that are now available for all the USHPRR, several areas requiring additional experimental data measurements are highlighted.