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**An Overview of Analyses for the LEU Conversion of the Transient  
Reactor Test Facility (TREAT)**

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**ABSTRACT**

Extensive analyses have been performed to support the conversion of the Transient Reactor Test Facility (TREAT) from its current highly enriched uranium (HEU) core to a low-enriched uranium (LEU) core, in keeping with the mission of the DOE NNSA Material Management and Minimization (M3) Reactor Conversion Program. TREAT is a graphite-reflected, graphite-moderated, and air-cooled reactor designed for the transient testing of reactor fuels and other materials. In coordination with the fabrication and design efforts, the conversion analyses have focused on developing an LEU core for TREAT which can maintain the experimental capabilities of the existing facility while continuing to operate safely. Following the selection and detailed evaluation of a TREAT LEU conceptual design in early 2016, a number of additional analyses were performed including design sensitivity studies, LEU-to-HEU core comparisons for additional performance and safety parameters, and simulations to support the planned irradiation testing of LEU TREAT fuel material. Key recent TREAT LEU conversion analysis results are presented here.