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**Microstructural Characterization to Support Development of  
Dispersion and Monolithic LEU U-Mo Fuels**

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**ABSTRACT**

The Material Management and Minimization program is developing low-enriched uranium (LEU) fuels to reduce the demand for highly-enriched uranium (HEU) fuels currently used in research and test reactors throughout the world. One fuel type being developed is a U-10Mo monolithic fuel, which is comprised of a U-10Mo fuel foil with a Zr diffusion barrier that is clad with AA6061. Another type of fuel being developed is a U-Mo dispersion fuel comprised of U-Mo fuel particles in an Al or Al alloy matrix that is clad with an Al alloy cladding. To support the successful qualification of both of these fuel types, it is critical to develop the capability to successfully manufacture both fuel types and to understand changes in the as-fabricated fuel microstructure due to irradiation. The microstructural characterization being performed is being done in a way to support both major goals. Many characterization techniques are being employed on both un-irradiated and irradiated samples, including optical metallography, scanning electron microscopy, transmission electron microscopy, and electron energy loss spectroscopy. Additionally, a focused ion beam is being used to make high-quality samples that can be employed for microstructural characterization. This presentation will discuss the progress made over the last few months looking at a variety of different dispersion and monolithic fuel samples. Some of the key observations that have been made will be highlighted.