

## **NE-20-21540, Advanced Test Reactor (ATR) Experiment Design for Measurement of Lightbridge Fuel™ Physical Properties**

Measurement of several fuel material physical properties (e.g., swelling and thermal conductivity), as a function of fuel burnup, are necessary to finalize Lightbridge's fuel design and safety analyses required by the U.S. Nuclear Regulatory Commission for fuel licensing. These properties are key inputs to a variety of design basis accident analysis models and simulations. Since the closure of Norway's Institute for Energy Technology Halden Reactor in June 2018, access to test reactors has been significantly limited to perform these types of burnup-related experiments needed to validate expected fuel material properties, thus impeding progress towards design finalization.

Lightbridge Corporation will work with Idaho National Laboratory (INL) to design an irradiation experiment and safety case output for accelerated burn-up. The fully designed Advanced Test Reactor (ATR) irradiation experiment and safety case outputs will allow Lightbridge to move forward with fabrication, accelerate irradiation in the ATR to varying levels of fuel burnup, and measure important thermo-physical properties of Lightbridge Fuel™. This irradiation experiment design and subsequent outputs are key steps in the domestic commercial deployment of Lightbridge Fuel™ advanced fuel technology.