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**Experiment Validation Protocol for Flux Wire Measurements in the
Advanced Test Reactor**

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ABSTRACT

The Advanced Test Reactor (ATR) is used to irradiate and qualify nuclear fuels and materials. Due to the large number of experiment positions and cost, in-core instrumentation for some experiments may not be feasible. In these instances, modeling of experiment conditions using high-fidelity neutron transport codes is used to quantify the irradiation conditions such as fission power density and fissile material burn-up during irradiation. Validation of fissile material burn-up can only be performed during Post-Irradiation Examination (PIE). PIE typically occurs months or years following irradiation. During each irradiation cycle, nickel and cobalt flux wires are installed throughout the ATR, which can be used to validate computational models and determine an adjusted neutron flux for many of the experiment positions. The two wires allow for measurements of the thermal and fast neutron flux in each of the positions. The protocol used to validate experiment models using flux wires installed in the ATR will be presented. The paper will also present results obtained from the ATR Operating Cycle 162B, which included the European Mini-Plate Irradiation Experiment (EMPIrE).