

## **NE-21-26492 Extension of Cable Electrical Assessment Techniques to Detect and Discriminate Radiation Aging on Cable Insulation Systems**

Kinectrics AES, located in Naperville, Illinois, is a division of Kinectrics Inc, which supports nuclear and transmission and distribution business areas in the U.S. Their mission is “to improve our customers’ business by delivering sustainable and innovative life cycle management solutions to nuclear and electricity industries, through our facilities, processes, and people.”

As plant operating lives are increased from their original 40-year life to 60 or 80 years, Low Voltage (LV) cables will experience degradation, either from radiation or from thermal and radiation effects combined. While the physical-chemical impact of these types of aging on most cable materials is known, the electrical diagnostic response of the cable system to radiation is minimally understood. This work seeks to close the gap in the detection and quantification of radiation aging and combined thermal and radiation aging in nuclear cable applications using electrical test methods.

Pacific Northwest National Laboratory (PNNL) offers unique capabilities such as the HEF Co-60 point source that will simulate radiation aging and assess the combined effects of thermal and radiation aging. The ability to target aging of short lengths in a longer cable as well as the organic material aging expertise are critical capabilities at PNNL. Kinectrics’ ability to characterize the changes affecting the cable electrically and discriminate between them to provide an accurate assessment of cable condition, will assist plant operators to focus repair, mitigation, or replacement efforts.