

**Source Term Reduction via Activity Releases during CANDU® unit outages.**Y. Verzilov<sup>1\*</sup>, A. Dykstra<sup>2</sup><sup>1</sup>Kinectrics Inc., Canada; <sup>2</sup>Bruce Power L.P., Canada

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Integrated Source Term Monitoring Program (iSTM) is a novel and first-of-its-kind program that has been specifically developed for CANDU® plants and is currently implemented in 21 reactor units. The main goals of this program are centered around optimization of radiological protection and minimizing source term.

This paper presents the study of monitoring the gamma activity transport as a result of a controlled pH<sub>a</sub> lowering of the PHT (Primary Heat Transport) coolant during an outage. Under such conditions, some crud and dissolved activity were released during the outage from the surface of the magnetite deposited on the feeders. Crud and activity were mobilized during the PHT pumps start-up, and either removed by the PHT filters and IX resins or redeposited on other PHT system surfaces. Therefore, a number of gamma activity scans and in-situ spectroscopy surveys were performed as a part of the investigation before and after the planned pH<sub>a</sub> lowering. The spent PHT purification components replaced during the outage were also characterized to estimate the inventory of the gamma radionuclides captured by them. Finally, continuous monitoring of gamma activity during the PHT pumps start-up at the end of the outage was performed. Based on the results and interpretations of the obtained gamma spectroscopy data, impact analysis of the activity release on the source term was undertaken.