

Development of a Novel Framework for the Application of Signature Based Safeguards (SBS) to Pyroprocessing

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Abstract:

Traditional nuclear material accountancy (NMA) faces several challenges when applied to pyroprocessing facilities. To address these challenges, alternative methods of safeguarding nuclear material are being developed. One method is process monitoring (PM). PM involves taking operational process data and applying it to safeguards using an advanced framework. Signature Based Safeguards (SBS), a proposed PM framework, involves the identification of anomalous scenarios and the subsequent identification and detection of their respective PM signatures from a system of measurements. SBS has previously focused on failure modes that result in transfer of mass to unexpected places in the mass flowsheet. This work developed a methodology for the identification of failure modes and determined their effect on the facility mass balance. This seminar focuses on a single case study of the cathode retraction linkage failure and the computational analysis on the electrorefiner and facility levels.

Bio:

Philip Lafreniere is a PhD student at UNM finishing his Dissertation in Spring 2018 in research focusing on pyroprocessing safeguards. He has no idea what he's doing with his life post-graduation. He enjoys in his free time shooting 8 ball down at the pool hall, the basketball stylings of the Milwaukee Bucks, and hanging at the Moose Lodge.