

**2017 Mo-99 TOPICAL MEETING ON  
MOLYBDENUM-99 PRODUCTION TECHNOLOGY DEVELOPMENT**

**SEPTEMBER 10-13, 2017  
MONTREAL MARRIOTT CHATEAU CHAMPLAIN  
MONTREAL, QC CANADA**

**A Risk Analysis of the Molybdenum-99 Supply Chain Using Bayesian  
Networks**

J.R. Liang  
The George Washington University  
2121 I St NW, Washington, DC, USA 20052

**ABSTRACT**

The cessation of routine Molybdenum-99 ( $^{99}\text{Mo}$ ) production at the National Research Universal (NRU) reactor in Canada, which historically had the highest  $^{99}\text{Mo}$  production capability worldwide, has led to widespread concern over the ability of the  $^{99}\text{Mo}$  supply chain to meet demand. There is significant disagreement among analyses from trade groups, governments, and other researchers, predicting everything from no significant impact to major worldwide shortages. Using Bayesian networks, this research focused on modeling the  $^{99}\text{Mo}$  supply chain to quantify how a disrupting event, such as the unscheduled downtime of a reactor, will impact the global supply. This not only includes quantifying the probability of a shortage occurring, but also identifying which nodes in the supply chain introduce the most risk to better inform decision makers on where future facilities or other risk mitigation techniques should be applied.