Proving the Negative: The Evolution of Nuclear Safeguards and Challenges for Implementation

Under its State Level Concept, the International Atomic Energy Agency envisions a State Level Approach for safeguards implementation that considers, inter alia, a state’s nuclear and nuclear-related activities and capabilities as a whole when developing an annual safeguards implementation plan. As safeguards planning has become more dependent upon predictions of acquisition path completion time and assurances of the absence of undeclared activities, safeguards effectiveness and efficiency are potentially undermined when a state’s capabilities are underestimated. To begin to address these issues, this talk will first explore theory and evidence to characterize sources of uncertainty affecting estimates of completion time. The hide-and-seek dynamic affecting the detection of undeclared activities will then be considered, introducing optimal search theory to inform stopping criteria for search efforts. Based on this discussion, several policy-relevant insights are identified that contribute to the ongoing development of the State Level Concept.

Lance K. Kim was most recently a Research Fellow in the Nuclear Security Unit of the Institute for Transuranium Elements at the European Commission Joint Research Centre (JRC) in Ispra, Italy. His research focused on open source information acquisition and analysis for nuclear security and non-proliferation, and on Acquisition Pathways Analysis in support of the European Commission Support Program to the International Atomic Energy Agency’s (IAEA) Department of Safeguards. Prior to the JRC, his work experience include stints at the Nuclear Regulatory Commission in reactor safety, the IAEA as a US Support Program Fellow in safeguards, the Department of State as an intern in verification and compliance, and the RAND Corporation as a Stanton Nuclear Security Fellow. He is a graduate of the University of California, Berkeley with a B.S. in Nuclear and Mechanical Engineering, a M.P.P. in Public Policy, and a Ph.D. in Nuclear Engineering where he was a Public Policy and Nuclear Threats Fellow.