



Contribution ID: 82

Type: Oral

Characterization of Nuclear Material Interdicted in South Africa

Tuesday, 8 July 2014 14:20 (20 minutes)

As part of the effort to strengthen international cooperation in nuclear forensics and nuclear security, the U.S. National Nuclear Security Administration's national laboratories at Livermore (LLNL) and Los Alamos (LANL) signed a Memorandum of Understanding with the Nuclear Energy Corporation of South Africa (Necsa) in 2011 to collaborate on establishing, maintaining and strengthening nuclear forensic capabilities in South Africa. As part of this on-going collaborative engagement, Necsa and LLNL are collaborating on the analysis of a uranium-rich sample recently seized in Durban, South Africa in a coordinated operation involving the South African Police Services, the National Prosecution Authority of South Africa and the South Africa Nuclear Energy Corporation. An aliquot of the seized material was transferred to LLNL by the Necsa's Nuclear Obligations Management Services Department following protocols and procedures outlined in the IAEA's Nuclear Security Series No. 2 Model Action Plan. We will discuss the results of the forensic analyses including major and trace element composition, uranium assay, isotope abundances for O, U, Sr and Pb, near IR/VIS spectroscopy, morphology and grain size, molecular structure and 'age' (time since the last chemical purification). These data will be compared to information contained in the NNSA's Uranium Sourcing Database and used to help constrain potential sites of origin of the material.

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Session Classification: Technical Session 2E