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Building a Nuclear Forensic Analysis Capability in South Africa

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The threat of nuclear proliferation requires international co-operation and the development of improved measures for the prevention, detection and response to incidents of illicit trafficking of nuclear and/or radiological materials. No single country or nation-state can address this critical 21st century problem in isolation, even on a local scale, without global engagement. To meet this need, the Confidence Building Measures (CBM) Program within NNSA's Office of Nonproliferation and International Security promotes international engagement efforts to assist partner countries develop and strengthen indigenous capabilities in nuclear forensics. South Africa provides an excellent example of the ways in which CBM activities promote and expand nuclear forensic analysis capabilities. Beginning with the signing of a Memorandum of Understanding in 2010, the Nuclear Energy Corporation of South Africa (Necsa), Lawrence Livermore National Laboratory and Los Alamos National Laboratory initiated an ambitious collaborative effort featuring scientist-to-scientist engagement to develop South Africa as a regional center of excellence in nuclear forensics. Over the past three years this partnership has held several meetings of nuclear forensic experts, carried out extensive hands-on training of Necsa scientists in nuclear forensic analysis techniques and established a dedicated cleanroom facility at Necsa, including a state-of-the-art ICP-MS, for the forensic processing and analysis of nuclear materials. Next steps include advanced training in ICP-MS analysis of U-rich materials and in nuclear forensic database development and a joint exercise featuring analyses at all three partner laboratories of uranium ore concentrate.

We will discuss the current status of the nuclear forensic analysis capability at Necsa and describe how our approach has enabled Necsa to build and enhance South Africa's nuclear forensics capacity through the establishment of collaborations with national and international agencies with regard to the handling, characterization and analysis of nuclear and other radioactive materials.

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