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Establishing Canada's National Nuclear Forensics Laboratory Network

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Subsequent to the 2010 Nuclear Security Summit, Canada concluded that its existing capability for nuclear forensics would best be augmented by establishing a national nuclear forensics laboratory network, which would include a capability to perform forensic analysis of evidence contaminated with radioactive material. At the same time, the need for a national nuclear forensics library of signatures of nuclear and radioactive materials was recognized. The Defence Research and Development Canada Centre for Security Science (DRDC CSS), a joint initiative of DRDC and Public Safety Canada, funds science and technology initiatives to enhance Canada's preparedness for, prevention of, and response to potential threats. DRDC CSS, with assistance from Atomic Energy of Canada Limited (AECL), is leading the Canadian National Nuclear Forensics Capability Project to develop a coordinated, comprehensive, and timely national Nuclear Forensics capability.

A robust nuclear forensics program requires a wide range of expertise found across several government agencies, making it necessary to formalize a network of these organizations, providing a framework for collaboration. Canada's Nuclear Forensics Laboratory Network is envisioned to consist of several laboratories with complementary capabilities in the fields of radioactive measurements, analytical chemistry (both isotopic and elemental compositions), physical characterization, optical and electronic microscopy, and surface and particle analysis, as well as having radioactive/nuclear material handling facilities. In addition, law enforcement agencies and other federal departments are partners in the project providing advice and guidance on the overall direction of the development effort, in order to ensure that the project outputs are consistent with the requirements and expectations of the user community. In order to expand and strengthen Canadian capabilities, a strong collaboration is required among radiation scientists, forensic scientists, law enforcement, policy makers, and operational support teams, such as radiation protection and nuclear materials handling specialists.

The process of building up this integrated laboratory network has commenced, with several tasks already underway, including, identification of requirements for laboratories within the network, cataloguing of current network laboratory capabilities, drawing up of action plans to address any identified capability gaps, and development and delivery of training plans for nuclear and classical forensic scientists. As the project progresses, it will undertake the planning and execution of both inter laboratory comparisons and an operational exercise geared towards lab network implementation. The paper presents Canada's approach to establishing the laboratory network component of this national nuclear forensics capability, and discusses project tasks in detail, including challenges encountered during implementation of these tasks.

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