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## The Nuclear Forensics International Technical Working Group (ITWG): The Evidence Working Group

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In a law enforcement investigation, evidence from the scene of a crime is critical in identifying suspects, developing tangential investigative leads, and linking individuals or groups to criminal actions. It is therefore imperative that evidence be collected, stored, and examined in a manner to best preserve those characteristics important to the investigation, the prosecution, and likewise to the defense. While the proper handling of evidence is well practiced on a daily basis worldwide, evidence from a nuclear security event, that is, the addition of radioactive/nuclear material to the event site and to the evidence, can present unique and very difficult challenges to both the forensic collector and the forensic service provider.

The Nuclear Forensics International Technical Working Group (ITWG) is an informal collaboration among practitioners of nuclear forensics - laboratory scientists, law enforcement personnel, and regulatory officials - who share a common interest in preventing illicit trafficking in nuclear and other radioactive materials out of regulatory control. In 2012, the ITWG established the Evidence Working group to address common issues with the collection, transport, analysis, and reporting on evidence contaminated with or consisting of radioactive and nuclear materials. In 2013 at the annual ITWG meeting in St. Petersburg, Russia, the following tasks were set before the assembled volunteers.

- Proposed Task #1: Develop a document to discuss chain of custody/continuity of evidence. The chain of custody/continuity of evidence refers to those procedures and documents that account for the integrity of physical evidence by tracking its handling and storage from its point of collection to its final disposition. Such a document would aid laboratories not currently performing forensic work to understand the intricacies of chain of custody/continuity of evidence and how these may be implemented.
- Proposed Task #2: Development of a series of topical papers on the conduct of traditional forensic examinations on evidence containing nuclear or other radioactive material. These traditional forensic examinations include fingerprints (also referred to as fingermarks), genetic markers such as nuclear DNA, and toolmarks. Procedures exist for conducting such examinations on evidence that is free of detectable nuclear or other radioactive material. But procedures for evidence containing nuclear or other radioactive material are less well-developed. This series of documents would be developed for both the radioactive/nuclear materials laboratory where these techniques may be applied and for law enforcement, who may be bringing these techniques into a radioactive/nuclear materials laboratory.
- Proposed Task #3: Development of an evidence collection plan framework document. What information would forensic collectors need to ensure that they properly consider the packaging, storage, transport of items of evidence which may be radioactive or contaminated with radioactive materials. This includes balancing the needs of the investigator with the acceptance requirements of the receiving laboratory. This document would discuss the needs for a comprehensive, yet flexible plan describing the collection of evidence.
- Proposed Task #4: Development of an Examination Plan Checklist. The Examination Plan is the master control of what happens to the evidence, who does what, which procedures are performed, etc. Eventhough examination plans are critical documents, they are often written in haste and with minimal forethought to other investigative and safety needs. An Examination Plan checklist would provide the nuclear forensic laboratory a step-wise path ensuring that important points (such as destructive vs. nondestructive analysis) are brought out and agreed upon by the examiners and the law enforcement officials.

After discussion about the scope of this new working group and how the previous four (4) tasks are within this scope, the following points were agreed upon by the volunteers present.

- The Nuclear Forensics International Technical Working Group's "Guidelines for Evidence Collection in a Radiological or Nuclear Contaminated Crime Scene", published in 06 June 2011 is the basis for our work.
- Several volunteers agreed to expand and develop Proposed Task #1 and Proposed Task #2. Volunteers for Task #1 will be using a draft version of a document begun in the ITWG Guidelines Working Group, while additional volunteers will be working on Proposed Task #2 drawing from published scientific works and personal experiences.
- Proposed Task #3 and Proposed #4 require further discussions and were tabled until a future date.

Overall, the first meeting of the ITWG Evidence Working Group was a success. It established a clear path forward for several new documents which will aid those who will handle, examine, and store radioactive/nuclear evidence. Emphasis will be placed on supporting the radioactive/nuclear materials laboratory, the nuclear forensics service provider, the traditional forensics service provider, and law enforcement organizations.

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