THE NUCLEAR SMUGGLING INTERNATIONAL TECHNICAL WORKING GROUP: MAKING A DIFFERENCE IN COMBATING ILLICIT TRAFFICKING

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The ITWG was first formed in 1995 for the purpose of fostering international cooperation for combating illicit trafficking of nuclear materials. The initial focus for the ITWG was on the development of nuclear forensics to help answer attribution questions regarding nuclear materials of unknown origin. More recently, the ITWG has also expanded its focus to include detection of nuclear materials during transit. This paper presents some of the key developments by this group and their potential impact for combating nuclear smuggling.

The initial focus of the ITWG was to write a status report on international cooperation on nuclear smuggling forensic analysis. This 26-page report summarized previous work on nuclear forensics and gave an initial analysis on prioritizing techniques and methods for forensic analysis regarding source and route attribution. This report was submitted to the G-8 countries, and shortly thereafter, nuclear forensics was endorsed at the Moscow Summit in April, 1996, as part of an illicit trafficking program. The work of the ITWG has also been noted at subsequent summit declarations, e.g. Cologne.

The ITWG's primary goal is to develop a preferred approach to nuclear forensic investigations that is widely understood and accepted as credible. The technical elements include: 1) development of protocols for a) collection and preservation of evidence and b) for laboratory investigation, 2) prioritizing of techniques for forensic analysis, 3) development of forensic databanks to assist in interpretation, 4) executing inter-laboratory exercises, and 5) facilitating technical assistance to countries upon request.

The development of protocols has been conducted jointly by law enforcement officials and laboratory scientists. A major focus during much of the past six years has been the development of a model action plan for nuclear forensics. This action plan lays out the elements that are needed in the instance that illicit nuclear material is uncovered, e.g. incident response, crime scene analysis, collection of evidence (both radioactive and "traditional" forensics, transportation to a nuclear facility, subsequent laboratory analysis, and then development of the case. The action plan recommends categorizing the SNM material (i.e. weapons-grade, weapons useable, or reactor-grade) in the field when possible.

The ITWG meetings also include reports on scientific studies that help to advance nuclear forensics. For example, at our meeting two years ago (ITWG-6 held in Vienna) the following topics were presented: age-dating and source attribution for Pu production, verification of assumptions in age-dating of nuclear materials, a follow-up study on the Pu sample that was used in a round-robin experiment, the initial results of an investigation of the material characteristics of nuclear materials that might be used to identify the location of fabrication plants, and the ITRAP study by the IAEA on detection at border crossings.

Many potential forensic clues cannot currently be interpreted due to the lack of appropriate databases. Several years ago, this need led to a joint effort by Russian and the European Commission (at ITU) to develop a forensics databank. They have developed a structure for the database that naturally complements the questions that are raised during an investigation. Some of the data in the databank are jointly shared, while other data entries are accessible by only the one party with the appropriate authorization. In addition to such a formal databank, the ITWG recognizes a future need to develop a network of experts with appropriate access to databases in order to assist others in interpreting the results from a nuclear forensics investigation.

International exercises have been instrumental in helping the ITWG to assess the value of various experimental techniques for answering attribution questions. Our first exercise involved a sample of Pu, and the second one (which should be completed by the time of this Conference) focuses on a HEU sample. These exercises give a concrete focus to discussions of the pros and cons of various forensics measurements and their interpretation. The goal is to learn together how to better do nuclear forensics, rather than serve as a competition between laboratories.

Numerous examples can be cited for how work by the ITWG has provided assistance to countries that are developing programs for combating illicit trafficking. Again using the ITWG-6 meeting as an example, reports were given at that meeting by Latvia, Hungary, and Ukraine on recent progress that specifically drew upon earlier work by the ITWG. In the latter two countries, exercises were held that included a test and demonstration of the ITWG's model action plan for nuclear forensics. In another talk, Bulgaria reported on a case of intercepted HEU that was subsequently analyzed by another country with the necessary specialized laboratory facilities. The results of that forensic investigation will be presented at ITWG-7 (June, 2002).

Several years ago the ITWG began to address the issue of detection of SNM during transit. This topic frequently arises due to the technical linkage between nuclear forensics and radiation detection, plus many of the ITWG participants are directly involved in detecting transit of nuclear materials. One product was an evaluation of a survey of border detection systems. This evaluation helped to summarize the information provided, plus recommendations were made for possible future improvements.

Because the ITWG is a highly informal group, the annual meetings are the principle means of communication. Increasingly, however, it is using task groups to continue work between meetings. Examples of the subjects of recently formed task groups are: Pu isotopics of reactors, HEU detection research needs, identification of databases and knowledge experts for nuclear forensics, and IAEA/ITWG cooperation.