

ITWG - A Platform for International Cooperation in Nuclear Forensics

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**Nuclear Smuggling
International Technical Working Group (ITWG)**

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The availability of nuclear material is essential to meeting the world's 21st century energy needs



- Nuclear energy capacity worldwide is expected to increase between 25% and 200% by 2030 (IAEA)
- The inventory from atomic weapons production, development, and testing during the Cold War is substantial and utilized for global energy demands
- National response plans are essential for states to respond to the unauthorized diversion of radioactive materials
- Nuclear forensics shapes the response to diversion of radioactive materials as well as authenticates declared nuclear activities
- Measurement of isotopic ratios, trace elements, and physical characteristics (e.g. “signatures”) provides insight into the source and manufacture of radioactive material as well as subsequent history
- The ability to link materials between individuals, sites, and specific times is essential to incidents reported in the International Atomic Energy Agency’s Illicit Trafficking Database

The objectives of the ITWG are to promote technical nuclear forensic best practice for the community



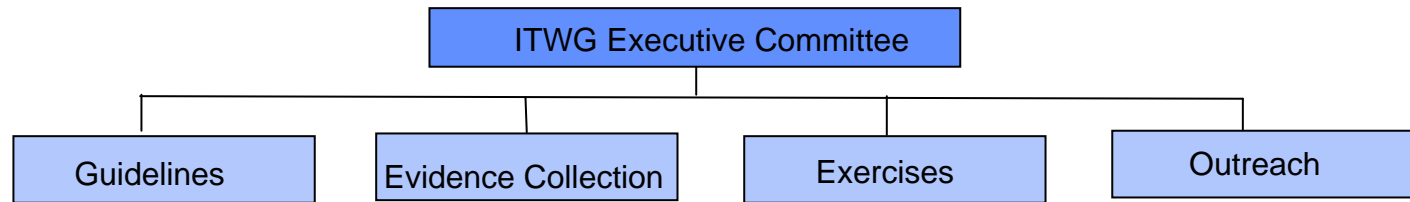
ITWG-13 Sofia, Bulgaria 2008

- The Nuclear Smuggling International Technical Working Group was established in 1995 in response to international concerns over reported incidents of illicit nuclear trafficking
- Dedicated to advancing nuclear forensic best practice and is unique as a working group of scientists, law enforcement, and regulatory officials
- International interest in ITWG activities continues to grow; the June 2008 13th annual meeting in Sofia, Bulgaria drew 77 participants

- A guiding principal is a comprehensive approach to nuclear forensic investigations commencing at the incident site through interpretation and reporting
- ITWG delivered input to the Agency's Nuclear Security Series No. 2 document 'Nuclear Forensics Support' published in 2007

An introduction to the ITWG, including its creation, its terms of reference, and organization was provided at the Agency's 2007 Conference "Illicit Nuclear Trafficking: Collective Experience and the Way Forward" in Edinburgh in 2007

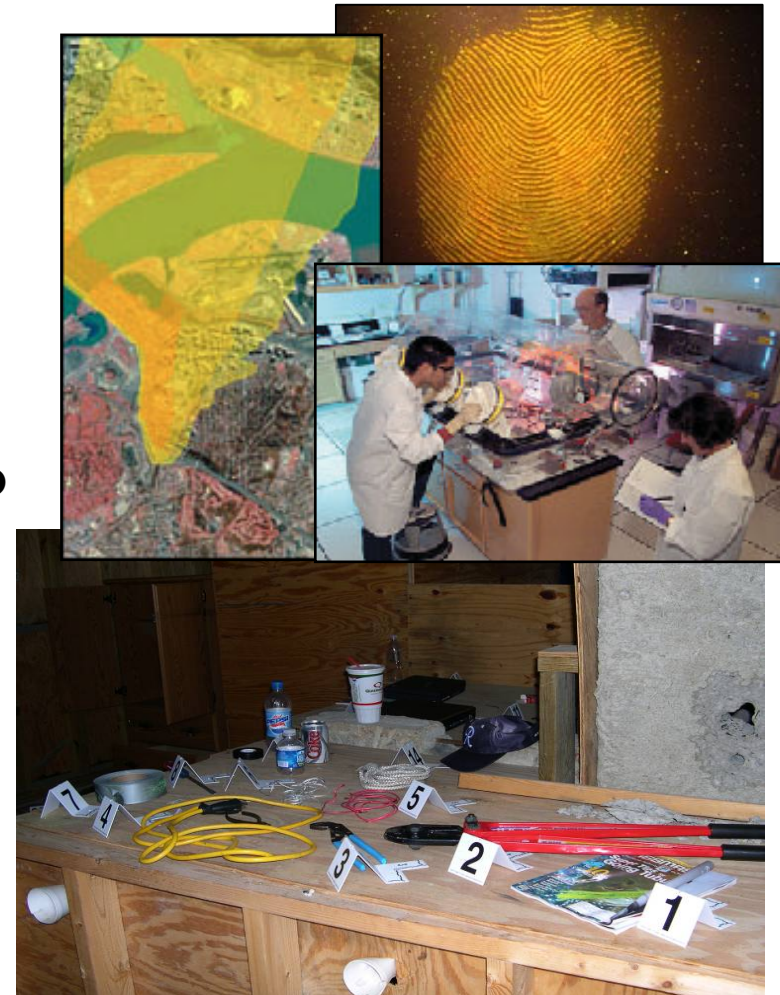
Task Groups conduct the work of the ITWG



- **Task Groups are standing committee of experts**
- **Executive Committee oversees the task groups and sets technical priorities**
- **Recent themes from the annual meeting:**
 - **Member states are actively developing their own capabilities to pursue nuclear forensic investigations across the nuclear fuel cycle**
 - **Law enforcement is partnering with nuclear forensics in the areas of infrastructure and training**
 - **Nuclear forensics is a critical component of national response plans to stem illicit trafficking**
 - **Participation from new member states is essential for sharing common experience and strengthening engagement**

Recent Progress: Evidence Collection Task Group

- **Bridge between analytical experts and law enforcement to best collect evidence**
- **Nuclear forensics evidence provides a challenge as an unknown and requires specialized facilities for processing**
- **Evidence group is seeking to catalogue national event exercises that are relevant to nuclear forensics**
- **Template distributed to member states and results compiled by the ITWG**
- **Also developing a draft methodology for recommended crime scene response involving radioactive contamination**



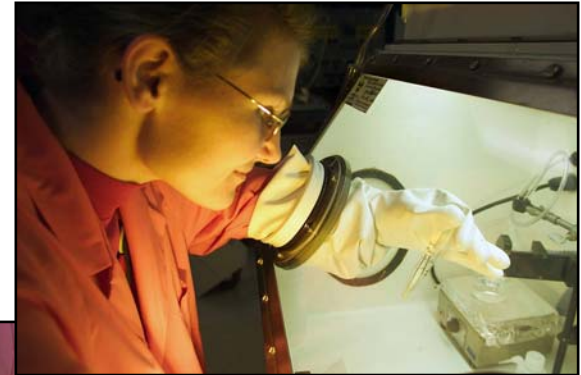
Recent Progress: Guidelines Task Group

- **Consensus guidelines allow laboratories to develop and improve their forensic capabilities, enable intercomparisons, and ensure results can be used in potential criminal prosecutions**
- **Generalized and not prescriptive**
- **Dynamic**
- **Draft guidelines include:**
 - **A framework for graded nuclear forensic evaluation**
 - **Crime scene response emphasis roles and responsibilities**
 - **Methods for radiochemical separations**
 - **Techniques for gamma spectrometry measurements**
 - **Techniques for thermal ionization mass spectrometry**
 - **Methods for analytical sampling**
 - **A taxonomy scheme for nuclear materials**



Recent Progress: Exercise Task Group

- Analytical and scenario-based exercises have been an essential activity of the ITWG since its inception
- Opportunity for laboratories to assess their performance on analysis of contaminated evidence as well as demonstrate capabilities
- Learning through shared experience; not designed to test or grade
- Analytical round-robin utilized plutonium in 1998-2000 and involved six laboratories
- Analytical round robin utilized highly-enriched uranium in 2000-2002 and involved ten laboratories
- Third analytical exercise is planned for later in 2009 with nine laboratories scheduled
- Task group also developing a plan for future exercise materials including low-enriched uranium fuel pellets and radiologically contaminated evidence (e.g. ^{90}Sr and ^{137}Cs)



Recent Progress: Outreach Task Group

- **Two distinct audiences: local experts who require technical information and government officials who require an orientation to nuclear forensics**
- **Transboundary nature of illicit trafficking necessitates awareness and cooperation between affected states with a focus on the nuclear fuel cycle**
- **Effective use of the ITWG web-site**
- **ITWG presence at recent international meetings convened by the Federal Bureau of Investigation, the Royal Society, and the American Association for Advancement of Science**
- **Close cooperation with the Office of Nuclear Security of the International Atomic Energy Agency and the Global Initiative to Combat Nuclear Terrorism**



The future of the ITWG

- Increased international participation in the ITWG requires a terms of reference (charter) that are written guidelines governing organization and conduct
- ITWG is exploring partnerships to facilitate expert training in nuclear forensics
- National libraries and databanks of radioactive materials are proposed as a mechanism to facilitate interpretation, attribution, and response
- ITWG has already promoted exchanges of samples and data through its round-robins and is poised to contribute to the discussions over development nuclear forensic data banks

The ITWG continues to expand as an international community of active practitioners in nuclear forensic best practice

January 2002

Scale 1:134
Robinson Projection
standard parallels 38° N and 38° S

The working group serves as a model for multi-lateral cooperation to achieve nuclear counter-terrorism and nonproliferation objectives

any representation is not necessarily authoritative.

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