

**International Conference on Topical Issues in Nuclear Installation Safety:
Defence in Depth – Advances and Challenges for Nuclear Installation Safety**

21–24 October 2013, Vienna, Austria

Extended Synopsis Submission Instructions

Submission deadline: **28 March 2013**
Submission e-mail: TIC-2013.Contact-Point@iaea.org
Submission subject: Int. Conference CN-212, synopsis

Note: Form B (and C, if applicable) are also due by **28 March 2013** through official channels.

Information related to the presenting author (please fill in accordingly):

Title of abstract	
Name and Surname	
Position and Title	
Institution, Department, Section/Unit	
Full postal address	
E-mail address & phone number	
<i>Short CV of the presenting author (100 words maximum):</i>	

The synopsis should be considered in the following topical area(s) (please mark accordingly):

- 1: Advances and challenges in the implementation of DID in siting, design and construction
- 2: Advances and challenges in the implementation of DID during commissioning and operation
- 3: Advances and challenges in the implementation of DID in accident management and emergency preparedness and response (EPR)
- 4: Cross-cutting issues in the implementation of DID

(Please consult the announcement for more specific indications of the topical areas likely to be covered by technical sessions.)

- 1. All authors with accepted abstracts will be invited to submit a full paper that will be included in the conference proceedings*
- 2. A limited number of papers will be invited for oral presentation. The selection will be such that each topic is well covered based on the sub-topics that appear in the announcement*
- 3. Papers that are not selected for oral presentation will be included in a poster session.*

The synopsis should be prepared using the format provided in the following 2 pages.

IAEA Coordinated Research Project: Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and Radioactive Materials

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This abstract has been modified for use as a model for the extended synopsis required for presentation at an IAEA Conference [1]. Please be aware this is merely an example of an abstract from a previous conference. It may, however, guide you in the proper formatting for your submission to be considered by the reviewing committee.

The particular details for submission are:

- a limit of 800 words;
- not to exceed two pages including tables and figures;
- submitted in Word format (.doc file extension) using Times New Roman 11-point font;
- submitted by 28 March 2013 as an attachment to an e-mail to: TIC-2013.Contact-Point@iaea.org

Equipment to detect illicit trafficking of nuclear and other radiological materials at borders and in a country has its own specific requirements and is very different from equipment used in other radiation monitoring cases. Automated and manual measurements need to be done in the field, often outdoors, at land or sea border crossing points or at airports. The free flow of goods and passengers must not much be impacted, thus requiring that the measurement time be short. The design needs to take into account that the users of the equipment are not experts in radiation detection, thus the results of the measurements should be easy to understand. The Coordinated Research Project “*Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and Radioactive Materials*” was undertaken during 2002-2006 to address technical difficulties in these areas, and to form a consensus regarding the most important technical requirements for border monitoring equipment [2].



Figure 1: CD cover for the report of the CRP.

A problem which proved to be very troubling to users of border monitoring equipment was becoming obvious at the beginning of this CRP: the radiation detection systems routinely generated a considerable number of radiation alarms, which need immediate response to categorize the source of the radiation (industrial, nuclear, medical or natural radionuclide). Without effective tools in the hand of the customs officers or border guards to quickly categorize the isotope, the entire process of border monitoring would not work. The ITRAP type test effort had, however, shown that none of the available RID instruments can pass. Therefore many contract and agreement holders worked on various aspects of resolving this problem. As a result, improved handheld instruments were designed (several of which have thus far been commercialized), a set of guidelines on simplifying user interfaces was developed, and techniques for categorizing alarms in various circumstances were studied.

Under the CRP, significant scientific/technical contributions were made by 26 research groups and invited experts from 18 Member States to address the above described problems. The topics investigated were:

- Detection Materials and Detector Response (5 projects)
- New Instrumentation Development (7 projects)
- Testing and Implementation Procedures for Border Monitoring Equipment and Support Facilities (7 projects)
- Verification of contents of sealed shipment containers (involving gamma radiation probes or detection) (3 projects)
- Characterization of a suspected RDD (1 project)
- Verification of contents of sealed shipment containers (involving neutron radiation probes or detection) (3 projects)

The yearly Research Coordination Meetings (RCMs) were also used to develop a set of technical specifications for border monitoring instruments, discussing and agreeing them with a group of users, developers, including experts of the IEC and ANSI standards committees, and other standards drafting groups. This activity was supported by a workshop at the JRC Ispra, where multiple instruments were used to evaluate test specifications and associated test procedures. As a result of this work, a technical specifications document, IAEA Nuclear Security Series 1: *Technical and Functional Specifications for Border Monitoring Equipment* (2006) was published. At the same RCMs, it was repeatedly noted by users that the instruments developed by manufacturers were not ideally suited for use by non-experts. Based upon these complaints, a usability guide for user interface design and instrument ergonomics was developed, presented and discussed.

The CRP-II "Development and Implementation of Instruments and Methods for Detection of Unauthorized Acts Involving Nuclear and other Radioactive Material" has been approved as a follow up of the first one to address, amongst other, the following issues: flagging of "innocent" alarms, identification of nuclear material, masked with NORM or medical isotopes, development of instruments and methods to support radiation surveillance at major public events and updating of technical specifications and test procedures for existing and new radiation detection instrumentation.

References

- [1] This conference web page, <http://www-pub.iaea.org/iaeameetings/43046/International-Conference-on-Nuclear-Security-Enhancing-Global-Efforts>, CN-203.
- [2] IAEA, Improvement of Technical Measures to Detect and Respond to Illicit Trafficking of Nuclear and Radioactive Materials, Vienna, IAEA TECDOC 1596 (2009).