Update ITEP Project Nr. 2.1.1.8
"Reliability Model for Test & Evaluation of Metal Detectors"
(follow-up of ITEP Project Nr. 2.1.1.2)

The metal detector trials, executed by the German Federal Institute for Materials Research and Testing (BAM) in collaboration with the Croatian Centre for Testing Development and Training (CROMAC-CTDT) and the University of Rostock were successfully accomplished from the 9th to the 31st of May 2005 at the CROMAC-CTDT test facilities in Benkovac, Croatia. The trials were aimed at improving some of the standardised procedures for testing metal detectors, as described in the CEN Workshop Agreement for Test and Evaluation of Metal Detectors (CWA 14747).

As a consequence of the preceding project (ITEP Project Nr. 2.1.1.2), which showed good results concerning statistical layout and evaluation of tests but some unrealistic low detection rates, the focus of the recent trials was to achieve an almost field like image of metal detector performance. The latter was achieved taking more care of the human factor and application conditions. A detailed training and implementation of the local SOP and working system to which the deminers are accustomed, including supervising and quality control, resulted to be a key factor.
The trial also served to continue the respectful dialog between professional deminers and scientists for mutual learning.
The preliminary trial results show higher and more realistic detection rates where it is physically possible e.g. for shallow mines. However, the results clearly show again the limit to find small metal content mines in un-cooperative soil below 10cm. The selection of only a few types of mines in the most important soil types at realistic depths helped to obtain a clear picture of influencing factors on the performance of metal detectors and to more clearly indicate differences between the metal detectors.

Next to the testing of a new approach to implement a statistical experimental design to the detection trials, a new approach was also tested to execute the maximum detection distance measurements. Furthermore, an R&R (Repeatability and Reproducibility) investigation of pinpointing capabilities was also conducted, aimed at providing valuable information about the extent of uncertainties and their sources.
The University of Zagreb provided expert assistance to the R&R experiments.
In setting up a modular model for the demining process the results of manual mine searching were further compared to measuring results of an automated scanning system of the University of Rostock in co-operation with the research project HuMin/MD (ITEP Project Nr. 2.1.1.7).
The trials were observed by the Geneva International Centre for Humanitarian Demining, the CROMAC-directors board, representatives of the metal detector manufacturers and the University of Zagreb.
In order to transfer the knowledge gained from the project into an internationally accepted amendment to CWA 14747:2003, it is planned to discuss it during an international "Round Table Discussion" in Autumn 2005. The final project report is expected to be published in October 2005.