The Landmine Threat

- There are more than 100 land mine and/or unexploded ordnance (UXO) affected countries in the world. Approximately 20 of these are heavily-affected, including Angola, Afghanistan, Croatia, Egypt, and Cambodia.

- More than a dozen countries produce landmines, including Cuba, Egypt, Singapore, and Vietnam; and almost 20 countries or rebel groups use landmines, including some countries that produce them.

- As estimated 45-50 million landmines infest at least 12 million sq. km of land around the world. These landmines:
  - Kill or maim a reported 10,000 people annually;
  - Create millions of refugees and internally displaced persons (IDPs);
  - Prevent hundreds of thousands of sq. km of agricultural land from being used;
  - Deny thousands of km of roads for travel;
  - Create food scarcities, causing malnutrition and starvation;
  - Interrupt health care, increasing sickness and disease;
  - Inflict long-term psychological trauma on landmine survivors;
  - Hinder economic development;
  - Undermine political stability.  

(from www.state.gov fact sheets)

The land mine clearing process must be faster and at the same time safer for the operators, reliable enough for the end user, which might be farmers or even playing children. The false alarm rate needs to be decreased to make it more efficient. Science can help to overcome the mine threat faster and safer.

There exist already twenty different methods for land mine detection, but only four of them are actually used in the field: the metal detector, the prodder, the dog and the mechanical clearance machines. And even for these no international valid reliability / test & evaluation standard exist yet. The pioneer document is the CEN BT 126 CWA 14747:2003 for test and evaluation of metal detectors, for which final design these ITEP trials are devoted.

The workshop

... is on the one hand very specifically aimed to reveal and evaluate the results of three big ITEP field trials with metal detectors we made, based on statistical rules and adapted from traditions in NDT(Performance Demonstration). On the other hand, we thought our experiences and the new knowledge we gained could be generalized and should be offered to the demining community. Anyway, we will propose an addendum to the CEN BT 126 CWA 14747:2003 document "Test & Evaluation of Metal Detectors", which will be transferred to IMAS later on.

We encountered also some basic problems about metal detector performance, soil influence, ground compensation, human factors, for which conclusion for research and practical activities would be a natural consequence. That is, why we would like to discuss the problems in a proper environment of responsible persons.

The workshop is composed of oral sessions where the strategies of contributing organizations will be presented together with the conception and results of the trials and the mentioned conclusions. In addition - the most important part - will be the "hands on" break out sessions, where we will present and discuss the practical procedures with all the involved and interested parties - especially the metal detector manufacturers. You are kindly asked to bring your devices/experiences/opinions to this break out sessions and a mini exhibition. The summary of the break out sessions will serve us as a red line to formulate the addendum to the CWA 14747:2003.

The program is still open for further ideas and contributions!

Workshop Committee
Christina Müller, BAM Berlin, Ute Böttger, DLR Berlin, Kurt Osterloh, BAM Berlin
Alois Sieber, IRC Ispra, Dieter Guelle, ITEP, Uwe Ewert, BAM Berlin
Vjera Kostelj, University of Zagreb - E-mail tic: christina.mueller@bam.de

ITEP – Workshop

Reliability Tests for Humanitarian Demining

December, 16-17, 2003

BAM, Berlin

Make Demining Safer and More Efficient!

- Discussion of Results of 3 Field Trials within the ITEP Project 2.1.1.2 “Reliability Model for Test and Evaluation of Metal Detectors” in Germany and Croatia
- Conception of Performance Demonstration and Modular Reliability – Transfer from NDT to Demining
- Plan of Experiments and Statistical Evaluation of Reliability Tests for Metal Detectors
- Lessons learned from International MAC’s
- Conclusion for Research and Future Development
Tuesday, DECEMBER 16, ITEP – Trial – Strategy and Results

Opening and Welcome
Chairperson: Uwe Ewert
Welcome and Opening Remarks
Manfred Hennecke, President of BAM
Dieter Guelle, ITEP – Secretary
Manfred Merk, Ministry of Defence / ITEP Excom

Plenary Session
Chairperson: Christina Müller
The Worldwide Landmine Threat and the German Humanitarian Mine Action Contribution
Detlef Schedler, Federal Foreign Office, Berlin, Germany

The UNMAS Strategy in International Mine Action
Noel Mulliner, United Nations Mine Action Service

From IPPCT to CEN – The history of the CEN workshop agreement and the strategy of the European Commission in Mine Action Standardisation
Alois Sieber, JRC Ispra, European Commission

The German Research Activity in Support to Humanitarian Demining
Karl Ulrich Voss, German Ministry of Research

Session: The ITEP Project
Chairperson: Thomas Böllinghaus
Introduction: Why the BAM is engaged in Reliability Tests for Demining
Thomas Böllinghaus: BAM Vice-President

Overview: The Project "Modular Reliability Model for Test and Evaluation of Metal Detectors", Transfer of Reliability Assessment Knowledge from NDT: The specifications
Christina Müller, BAM Berlin, Germany

Parameter Measurements of Detectors
Adam Lewis, Thomas Bloodworth JRC, Ispra, Italy

Soil Measurements
Dieter Guelle, ITEP, Adam Lewis JRC Ispra, Italy

Detailed Investigations of the Statistical Test Results and Correlation to Parameters
Mate Gaal, BAM Berlin / University of Zagreb

Scientific Planning of Experiments and Advanced Statistical Data Analysis using an Logistic Model
Peter Wilrich, FU Berlin

Sessions: The User Point of View
Lessons learned and Problems to be solved in Test & Evaluation for Mine Action in Croatia
Nikola Pavlovic, CRDOMAC

Lessons learned and Problems to be solved in Test & Evaluation for Mine Action in Afghanistan
N.N., MAC Afghanistan

Lessons learned and Problems to be solved in Test & Evaluation for Mine Action in Angola
N.N., MAC Angola

Lessons learned and Problems to be solved in Test & Evaluation for Mine Action in Mozambique
N.N., MAC Mozambique

Council for Scientific & Industrial Research Pretoria, South, Africa – The knowledge from South Africa
Ezra Jele, South Africa

The position of the Donor Community
N.N.

Social Event

Wednesday, DECEMBER 17, Conclusions and Need for Future

Breakout Sessions

Breakout Session 1: Setup of Test Lanes; Mines Selection
Ivan Steker, Gerd Hencke, Adam Lewis, Mate Gaal

Breakout Session 2: Soil Influence and Ground Compensation
Yoga Das, Dieter Guelle, Franciska Borry, Adam Lewis

Breakout Session 3: Human Factor
Christina Müller, Dieter Guelle, Davor Laura

Breakout Session 4: Rules for Plan of Experiments and Statistical Evaluation
Peter Wilrich, Mate Gaal, Christina Müller

Conclusions I: Practical Rules
Chairperson: Alois Sieber, Christina Müller
Summary of the Breakout Session 1: Mate Gaal
Summary of the Breakout Session 2: Yoga Das
Summary of the Breakout Session 3: Christina Müller
Summary of the Breakout Session 4: Peter Wilrich
Scope of a proposal for as Addendum to CEN CWA 14747:2003
Alois Sieber, Christina Müller

Discussion

Conclusions II: Practical Activities
Chairperson: Dieter Guelle, Noel Mulliner
The new program of GICHD for Manual Demining
Havard Bach, GICHD, Switzerland

Need for Improvement of the Human Factor
Vjera Kristelj, University of Zagreb

Need for a Worldwide Accident Data Base
Andy Smith, DIDACTYLOS

Conclusions III: Need for Research
Chairperson: Havard Bach, Karl Rudolf Voss
Need for a Broad System Competence
Elmar Breitbach, DLR, Germany

Need for a Systematic Approach in Evaluation and Development Based on Physics and Real Conditions
Ute Böttger, DLR, Germany

Need for an European Roadmap
Marc Acheroy, RMA Belgium

The Need for Investigation of Reproducibility and Repeatability and Reduction of Test Effort
Damir Markucic, Davor Antonic

Thursday, DECEMBER 18, Post-Conference-Program

Visit to High Precision UXO / Mine Test Fields and Mine Museum in Neu Golm
BTU-Cottbus/SENSYS