



Published by

United Nations
Mine Action Service
&
Geneva Centre for
Humanitarian Demining

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The Mine Action Technology Newsletter lets you know where to find more information and who to contact, where to go and what is going on in support of your work.

Introduction

This is the fourth issue of the Mine Action Technology Newsletter, produced by UNMAS and GICHD, dedicated to the promotion and development of related mine action technology.

We welcome new ideas, and suggested articles, and would happily share them with others if sent for inclusion in the Newsletter. Feedback from the field, NGOs, manufacturers, donors or headquarter organizations helps to make the Newsletter more effective.

This issue includes six feature articles; the UNMAS/GICHD Technical Workshop, the MINEHOUND™ Detector System, Handheld Standoff Mine Detection System (HSTAMIDS), Japanese technologies and two updates on ITEP activities. Also included is one page with snippets of general information and news.

The newsletter is also available on the UN Mine Action Service website, **E-Mine** (www.mineaction.org) and on the GICHD website at www.gichd.ch/15.0.html. Readers are once again invited to provide their own comment and to make constructive suggestions to the Editors, Noel Mulliner, Technology Coordinator at UNMAS, or Al Carruthers, Technology Officer in GICHD.

Mine Action
TECHNOLOGY
NEWSLETTER

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WHAT'S GOING ON IN TECHNOLOGY ?

Conferences, Training and other Events

Editor's Note: *If readers have details of any forthcoming conferences, symposiums or training events please submit the information to one of the editors. Mine Action Programmers should note that UNMAS has some limited funds to sponsor attendance at relevant technology conferences.*

3 – 7 July 2006. **Mine Action National Directors and UN Advisors Meeting (by invitation only)**

The Mine Action National Directors and UN Advisors Meeting is an annual meeting held by UNMAS and hosted by GICHD in Geneva. The aim of the meeting is to gather the Mine Action National Directors of UN supported programmes, UN Advisors and donors to discuss relevant issues in mine action in the framework of the UN Mine Action Strategy 2006-2010.

11 – 14 July 2006. **UXO/Countermine/Range Forum 2006, DoD's Preeminent Conference on Technology, Programs & Partnerships – Las Vegas, Nevada, USA**

The UXO/Countermine/Range Forum 2006™ assembles the best researchers, developers, policy-makers, and program planners from industry, government, and contractors to showcase cutting-edge technologies, ideas, programs and partnerships. The most difficult challenges in supporting the war fighter will be addressed in technical presentations, exhibits, speeches, and networking events at the Forum.

An exceptional program is planned to showcase the latest technologies, products, and services in the UXO, countermine, and range areas. Over

150 technical papers will be presented by military, government and contractor personnel. Over 100 exhibitors from industry and government agencies world-wide will present the latest products and services.

New this year are the sessions and exhibits on IEDs, one of the most important issues facing the military today. Through technical presentations and exhibits, attendees can explore and identify the new technologies, tactics, and methods to eliminate IEDs and protect personnel from explosives hazards.

For further information on the programme visit the website at <http://www.theforum2006.com/>

17 - 20 July 2006. **2006 Requirements Workshop - Crystal City, Arlington, Virginia, USA (by invitation only)**

The goal of the workshop is to identify requirements that will assist the US Humanitarian Demining Research and Development Program. Emphasis is placed on equipment used for mine neutralization, detection and clearance. One day of the program is devoted to a demonstration and display of equipment that is developed or undergoing development.

23 -25 August 2006. ***The Annual Nordic Demining Research Forum (NDRF) Summer Conference - Trondheim Norway.***

Each year NDRF organizes a number of Mini-seminars and one Summer Conference which are held at various places in the Nordic countries. The participants are invited to present on-going work and activities related to mine clearance or with a bearing to development and improvement of mine clearing. In this way, NDRF wishes to stimulate research and development through qualified exchange of information. The seminars and conferences include a number of presentations from 15 to 25 minutes. The aim of the presentation is to stimulate discussions and networking among professionals of various fields.

This summer conference will focus on four major topics:

- Situation and Environment
- Operations
- Detection and Systems
- Risk and Liability

For further information visit the website:
<http://www.ndrf.dk/documents/groupp/SS06-Programme.pdf>

25-27 September 2006. ***Vallon International Workshop 2006 - Eningen u.A., Germany***

Vallon is a major manufacturer of mine and UXO detectors and sponsors an annual workshop to showcase new products and provide a venue whereby users and the manufacturer can exchange experiences. The conference language is English and attendance at the workshop is free of charge. Participants will have to pay for travel expenses and hotel accommodation. Workshop details and

registration forms are on the Vallon Web Site at http://www.vallon.de/cont_e/news/workshops.html.

24-27 April 2007. ***Fourth Symposium on "Humanitarian Demining" - Sibenik, Croatia***

The Croatian Mine Action Centre (CROMAC) and the Centre for Testing, Development and Training (CTDT) will host the Fourth International Symposium "Humanitarian Demining 2007" at Sibenik, Republic of Croatia from 24 to 27 April 2007.

The Symposium will cover a large number of topics related primarily to mechanical demining issues and the employment and management of mechanical equipment in mine action. There will be special emphasis on the topics of area reduction, cost-effectiveness, and risk management. In addition, there will be live demonstrations of equipment by machine manufacturers and displays of other mine action equipment such as detectors and personal protective equipment. Further details can be obtained shortly from the CROMAC website:

<http://www.hcr.hr/index.php?link=pmdh&lang=en> or by contacting Nikola Pavkovic:
+385 (1) 650 0023 or nikola.pavkovic@ctro.hr

UNMAS/GICHD Technical Workshop Geneva, 15-17 February 2006

A very successful Technical Workshop was held at GICHD from 15-17 February 2006. This workshop was financed by a contribution from the Government of Canada and was co-sponsored by UNMAS and GICHD.

A total of 15 mine affected countries were represented along with six Non-Governmental Organizations and four commercial demining companies. The attendees were those at the operational level who were familiar with the current technical issues of demining operations. A questionnaire was distributed before the workshop and the agenda was derived from the problems and comments that were identified in the questionnaire. Workshop sessions included discussion on metal detectors and dual-sensor detectors, road clearance, manual demining, mechanical demining, personal protective equipment, neutralization devices, information management, communications, and surveys. Each session was preceded by a short introductory presentation and then the floor was opened to discussion.

Participants expressed the problems they were encountering and discussions followed where others could describe how they solved or addressed the problems. At the end of the session, requirements for additional work or gaps in technical knowledge and hardware were identified and a way ahead was recommended, where this was feasible.

The workshop raised many technical issues and the response from the participants was excellent. Many solutions were proposed, the discussions were lively and extremely beneficial, and a much clearer definition of user requirements was brought out.

The proceedings of the workshop have been placed on the GICHD website. (http://www.gichd.ch/fileadmin/pdf/technology/Technology_Workshop_2006/Technology_Workshop_Feb06_Proceedings.pdf). The feedback on the workshop from the participants was that it was one of the most productive and focussed sessions that they had attended and follow-on workshops, similar in nature should be held every two years.

Feature Article 2

MINEHOUND™ Detector System

The UK Department for International Development (DfID), in collaboration with the German Foreign Ministry (Auswärtiges Amt), contracted ERA Technology of the UK to carry out extensive field trials in Cambodia, Bosnia and Angola of an advanced technology, dual sensor, and hand-held landmine detector system called MINEHOUND™. This detector combines a metal detector with a Ground Penetrating Radar (GPR). The aim is to reduce the false alarm rate by at least 2:1, which will make a significant difference to the efficiency of demining operations. The Mines Advisory Group (MAG) of the UK assisted with the trials in Cambodia and Angola and Norwegian Peoples Aid (NPA) assisted in Bosnia.

Trial versions of MINEHOUND™ were built and used as a follow up detector, after existing standard operational procedures had been applied to the mine affected areas. At no stage during the trial were the dual sensor detectors operated as primary detectors.

The main objectives of the project were to:-

- Determine (document against ground truth) the performance of the dual technology detector, in terms of detection and false alarms, in trials in Cambodia, Bosnia and Angola.
- Determine the potential improvement in efficiency of demining operations.
- Review and report on the trials, including both quantitative performance data and qualitative feedback from the deminers.
- Assist the further development of the technology to production.

ERA Technology Ltd (UK) and Vallon GmbH (Germany) have designed and built MINEHOUND™, which incorporates state-of-the-art technology in landmine detection. Fifteen units were built for the trials and five units were shipped to each country for the period of the trials. Both MAG and NPA provided excellent support for the trials, which could not have succeeded without their practical assistance in logistics, site preparation and committed support from the deminers and their supervisors.

The trials were overseen by representatives of the International Test and Evaluation Programme (ITEP), which includes Belgium, Canada, the Netherlands, Sweden, the UK, Germany, the United States, and the European Commission. The trials of pre-production units in live minefields began in August 2005 and continued through to February 2006.

The trials took place over an 8-week period in each country. The performance of MINEHOUND™ was assessed in live minefields and compared against the existing, in-service, metal detector. MINEHOUND™ was not used for actual clearance but its performance was recorded for analysis. The deminer used the existing, in-service, metal detector to detect potential targets and, having found one, used MINEHOUND™ to determine whether metal was also indicated and what was the GPR response of the target. When the signal had been investigated, the deminer recorded the type and size of target, as well as its depth. The results were recorded and a database of MINEHOUND™ performance in a live minefield was built up.



Figure 1: MINEHOUND™ detector.

On arrival at the minefield the ERA team, and ITEP representatives, worked with the NGO to clear suitable areas. One lane was created for calibration and two lanes for the blind tests. The deminers' performance was also assessed weekly using a 12m "blind lane". Using specially designed targets both deminers and ITEP staff carried out blind tests. The calibration targets were comparable in size and content with a PMA2 mine and were buried at depths up to 10 cm next to metallic clutter of various sizes. In every blind test lane an equal number of calibration targets and clutter were emplaced. The training sites were established close to the live minefields

The conditions in Cambodia were hot and the ground was frequently waterlogged. The soil was also heavily mineralised and these conditions provided a demanding test.

In the live minefields in Cambodia, the deminers, using the Schiebel ATMID, recorded a total of 1,143 detections of which 13 were mines. However using MINEHOUND™, the deminers detected all the mines and only 210 suspect readings requiring further investigation, giving an overall reduction of better than 5 to 1 in terms of clutter rejection.

In the blind lanes in Cambodia over the 8-week trial period the four deminers achieved an averaged Probability of Detection (PD) of 92.5%. However, by the last week of the trial the PD had risen to 98% and the reduction in false alarms to 4.6:1 illustrating an improved performance of the deminers over time.



Figure 2: PMN6 AP mine in Kamrieng minefield shown uncovered prior to detonation

In the live minefields in Bosnia, two deminers, using the CEIA MIL D1, recorded a total of 1069 detections of which 7 were mines. Using MINEHOUND™, the deminers detected all the mines and only 142 suspect readings requiring further investigation, giving an overall reduction of better than 7.4 to 1 in terms of clutter rejection. In the blind lanes in Bosnia over the 8-week trial period the deminers achieved an averaged PD of 92.5% and an average reduction in false alarms of 1.89:1. However by the last week of the trial the averaged PD had risen to 95.5%.

In the suspect minefields in Angola, four deminers encountered a total of 1,153 detections none of which were mines. Using MINEHOUND™, the deminers detected 272 suspect readings requiring further investigation, giving an overall reduction of better than 4.24 to 1 in terms of clutter rejection. In the blind lanes in Angola over the

6-week trial period, the deminers achieved an averaged PD of 96.5% and an average reduction in false alarms of 3:1. However by the last week of the trial the averaged PD had risen to 100%.

In the minefield in Luau the deminers encountered 106 detections of which 3 were mines. Using MINEHOUND™, the deminers detected all the mines and 14 suspect items giving an overall reduction of better than 7.57 to 1 in terms of clutter rejection.

The trials did not record the time taken by the deminer to search, mark and excavate targets, but it is useful to visualise the impact in time that the reduction in false alarm rate can make. With a 5:1 reduction in false alarms a deminer using MINEHOUND™ can achieve in one day what a deminer using a metal detector would achieve in a week, or one deminer can achieve the same output as 5 deminers today. Of course this assumes a number of things including a vegetation free area as one deminer cannot cut the vegetation of 5 deminers as fast. However, if the ground can be prepared for him with a brush cutter for instance, the statistical returns can be achieved in areas of vegetation overgrowth as well.

These statistics should be of relevance for management planning today.

Summary

- All the trial objectives were achieved.
- Over 3,000 signals in live minefields were recorded.
- **ALL** the mines encountered in live minefields were detected by deminers using MINEHOUND™.
- In live minefields an overall improvement of greater than 5.4:1 in the reduction of false alarms was obtained compared with the in-service metal detectors.
- Working in a live minefield and following up the in-service detector with a new technology was effective and safe.
- The time to train experienced deminers was measured in hours.
- The feedback from the trials showed that the dual detector was effective.
- The deminers contributed to optimising the production design with valuable feedback.

MINEHOUND™ is now being jointly prepared by ERA Technology and Vallon GmbH for product release in late 2006.

HSTAMIDS operational with deminers in Cambodia, Afghanistan, and Thailand

Following the comprehensive, worldwide field evaluations and demonstrations (FEDs) of the Handheld Standoff Mine Detection System (HSTAMIDS) in humanitarian demining areas and scenarios from September, 2004 through December, 2005, the US DoD HD R&D Team launched the operational phase of the HD-HSTAMIDS program in the spring of this year. The HSTAMIDS now in HD operations is the production version that is standard issue with the US Armed Forces, and which was tested with five different demining teams from Afghanistan, Angola, Cambodia, and Thailand during the FEDs. It is a dual sensor system that integrates an electromagnetic induction (EMI) metal detector and a wideband ground penetrating radar (GPR). The system incorporates ground compensation and sensor data fusion software which provides the capability to discriminate mines from clutter. To date 2,000 systems are fielded and within a year, the number delivered will reach 3,000. The US has placed purchase orders for a total of 15,000 systems.

The US has rigorously evaluated this system with developmental, operational, and production testing. During this testing, the system has encountered more than 10,000 mine targets and over 50,000 pieces of clutter in widely varied environmental conditions in nine test arenas.

For the Humanitarian Demining FEDs in Southeast Asia and Africa, ITEP partners Canada, the Netherlands, Sweden, and the United Kingdom joined the US in testing the HSTAMIDS with humanitarian deminers. During the FEDs, the HSTAMIDS encountered over 2,000 mine targets and 4,600 pieces of

clutter. Although the FEDs were extremely challenging -- 15 different mine types, two-thirds of which were low metal content mines - the newly trained HSTAMIDS operators significantly outperformed the experienced operators using metal detectors.

Based on HSTAMIDS performance and feedback from the newly trained operators following the worldwide FEDs, the U.S. cooperating partners; the HALO Trust, Thailand Mine Action Center (TMAC) and MgM of Angola, urged the HD R&D Program to accelerate the operational employment of the system into ongoing mine clearance programs. In response to these requests, the U.S. constructed permanent training facilities in Cambodia, Afghanistan, and Thailand to establish bases of operations that would provide direct operational experience in widely varying environmental and threat conditions. The U.S. then provided training to the HALO Trust and MAG in Cambodia at the new HSTAMIDS training facility at HALO Trust's headquarters in Siem Reap in March and April 2006.

Following the training, the HALO Trust employed HSTAMIDS as its primary sensor at Bueng Trakoun West 4 in the K-5 mine belt within Banteay Menchey Province on 27 April 2006. On June 11, the Halo Trust identified Bueng Trakoun West 4 as clear and shifted HSTAMIDS operations to two other minefields. As of June 24, HSTAMIDS has demonstrated a 100 % probability of detection and has correctly identified 94 % of all clutter. In three separate minefields, HSTAMIDS has found 288 mines (7 different mine types), while rejecting over 37,400 pieces of clutter. Individual HSTAMIDS operator clearance rates are

approaching 200 square meters per day, which would provide more than a six-fold increase. Current plans call for expanding HSTAMIDS operations to other areas of operation within Cambodia.

Additionally, the U.S. conducted HSTAMIDS training with the HALO Trust operators in Afghanistan, and began operations there on 30 May 2006. The environmental conditions, the mine threat, and mine density in Afghanistan are markedly different than in Cambodia. After three weeks of operations in the rolling fields near Karizi Mir, the HSTAMIDS has demonstrated a 100 % probability of detection and has correctly identified 97 % of all clutter. In these areas, HSTAMIDS has found four mines (2 different types) and has rejected over 17,300 pieces of clutter.

Finally, the U.S. has completed HSTAMIDS training to deminers within the Thailand Mine Action Center at the training facilities in Sakaew Province Thailand. TMAC operations are scheduled to begin at the end of June in a densely vegetated area in conjunction with mechanical ground preparation technologies.

After 231 man-days of manual demining operations, operators employing seven HSTAMIDS have cleared more than 67,000 square meters, including data collection and verification. In addition, the HALO Trust HSTAMIDS operators have accurately discriminated more than 54,800 pieces of clutter in four different minefields without missing a single landmine. The results in this initial phase of HSTAMIDS employment as the first production dual sensor in demining operations are truly outstanding, but not unexpected. Indeed, they were achieved by a program with a systematic approach that before fielding: selected and thoroughly tested a mature system, conducted a comprehensive field introduction and extensive evaluations with demining teams, partnered with highly

competent organizations, and employed dedicated, well trained deminers.

Current US fielding plans call for continuing the ongoing operations, working with its cooperating partners to optimize standard operating procedures, and determining the long term, steady state performance of HSTAMIDS in manual demining operations. The U.S. is also exploring opportunities to introduce the HSTAMIDS in other, varied demining operations throughout the world.

Japanese Technologies

The Japanese Government has made a major investment into the Research and Development (R&D) of demining technologies, following an international conference in support of Afghanistan, held in Tokyo in 2001. In the beginning, some 80 ideas were put forward for consideration but only 12 were selected to receive funding support. In 2004, some of these equipments were taken to Afghanistan for field tests. They were then returned to Japan for modification and improvement. These equipments are now in the process of returning to Afghanistan for final accreditation and acceptance. As an additional outlet for the developed technologies it has been decided to test the Japanese equipments in Cambodia to see if they are suitable for employment there.

In May 2006 a Selection Committee (SC) was held in Japan to assist in the selection of those Japanese technologies that are suitable for Test and Evaluation (T&E) trials in Cambodia. The SC, hosted by the Japan International Cooperation System (JICS), consisted of four members from Japan and four members of CMAC. UNMAS was invited as an Observer.

Two categories of equipment are being considered - **demining machines** and **mine (not metal) detectors**, and considerable preparations have already been undertaken in Cambodia with the design and layout of the T&E sites. The trials will be completed before the end of the 2006.

The SC made the following selections to go to Cambodia:

Demining Machines:

Yamanashi Hitachi Construction Machinery
Push type flail – BM307-FV25 (**a 25 ton tracked flail**)

Yamanashi Hitachi Construction Machinery
BM307 -V33 (**a 38 ton tracked excavator with flail hammer**)

Kawasaki Heavy Industries Ltd
MineBull DM-4 AP mine clearance vehicle (**a 34 ton wheeled tiller**)

Komatsu Ltd
D85EX-15 base (**a 35 ton tracked earth tiller**)

Mine Detectors:

Hand held

Tokyo University (**Advanced Landmine Identification System (ALIS) combining Ceia Mil D1 metal detector with a GPR**)

Mitsui Fusion Sensing (**AP Mine Detector – combined metal detector and GPR**)

Vehicle Mounted

Tokyo Institute of Technology (**Gryphon 4 wheeled buggy and LAMDAR III – a GPR array**)

Tokyo Institute of Technology (**Gryphon 4 wheeled buggy and ALIS**)

Kawasaki Heavy Industries Ltd (**Mine Dog – a 10 ton wheeled vehicle carrying a GPR array**)

The variety of equipment design and function will provide a unique opportunity to test the performance of many different devices and the results of the T&E in Cambodia will be made available to everyone. It is expected that the

International Test and Evaluation Programme (ITEP) will be invited to attend and to publish the results through the ITEP website.

While the machines are developed equipments, and most have benefited from the addition of the recommendations of the previous tests in Afghanistan, the T&E in Cambodia may be able to be conducted for accreditation. However, the mine detectors are still very much in the development stage and so the T&E will more likely feed back into the R&D process. All devices will return to Japan after the T&E and be subsequently deployed if, and when, financial support has been established. The follow-on involvement by the Government of Japan will be important to see any future deployment and support.

For more details of the process of T&E in Cambodia, or the equipments being tested, please contact Noel Mulliner, Technology Coordinator, UNMAS.

Feature Article 5

ITEP Test and Evaluation of Humanitarian Demining Equipment, 2006

The [ITEP Work Plan 2006](#) (see [ITEP website](#)), compiles test and evaluation activities that will be carried out during 2006 by, or with, ITEP member countries. This summary is an update on activities initiated during 2005, which continue into 2006, and some new intentions. It further lists published ITEP test reports since November 2005.

Test and evaluation activities

Systematic Test and Evaluation of Metal Detectors (STEMD, [ITEP project, 2.1.2.3](#))

Two regional field trials (Laos, Mozambique,) to evaluate the current range of available metal detectors, were carried out during 2005. The reports are available at the ITEP reports website. The third trial was originally postponed by the JRC/EC and then cancelled. Germany may run this trial in 2006 and it may be combined with another trial ([ITEP project, 2.1.2.8](#)), evaluating two Russian metal detectors.

Evaluation of metal detector arrays for humanitarian demining ([ITEP project, 2.1.2.5 and 2.1.2.6](#))

Two metal detector array evaluation projects are planned for 2006. [ITEP project, 2.1.2.5](#), led by Canada with the Netherlands and Germany as partners, will evaluate several vehicle-mounted arrays in a controlled environment. [ITEP project, 2.1.2.6](#), led by the Netherlands, will continue this testing in less controlled conditions (different soil types) and in mine-affected countries.

Handheld Stand-Off Mine Detection System (HSTAMIDS) Operational Field Trials and Demonstrations Project ([ITEP Project, 2.4.2.6](#))

Trials in Thailand, Namibia and Afghanistan are now complete. A final test report is expected to be released soon. In 2006, Long Term Operational Evaluations of the HSTAMIDS are underway in Cambodia and Afghanistan and Thailand. During these evaluations, the system will be operationally employed as a primary, and sole, detector for extended periods in a variety of minefields. Data will be collected on the system and operator performance. Periodic status reports will be provided.

Assessment of the dual sensor detector MINEHOUND ([ITEP Project, 2.4.2.4](#))

Three long-term trials of the detector have taken place in Cambodia, Bosnia and Angola. The reduction in false alarm rate when a dual-sensor detector is used in the minefield was determined. Almost all ITEP Participants provided overseers during one or more of the regional trials. ITEP overseers observed the tests and implemented additional tests to acquire more data on the performance of the detector. The trial report, as well as the lessons learned report is due for publication by mid-2006. (See Feature Article 2).

Test and evaluation of available dual sensors to be used in humanitarian demining ([ITEP Project, 2.4.1.3](#))

This project is designed to look at all available dual sensor detectors and compile a “state of the art” report. The first stage (2006) will include the preparation of an optimal reliability test design and the evaluation in a controlled test area. During the second stage (2007), trials will be performed in real minefields with only those detectors that passed the first stage reliability trial.

Test and evaluation of the Bozena-5 medium flail ([ITEP Project](#), 3.2.33), the MineWolf tiller ([ITEP Project](#), 3.2.34), the MV-10 flail+ tiller([ITEP Project](#), 3.2.35) and the MV-20 flail + tiller ([ITEP Project](#), 3.2.36)

A set of flails and combined flail/tillers will be tested in Croatia during 2006 by Canada, in collaboration with Sweden and others, using the Croatian Centre for Testing Development and Training (CTRO) [Cerovac](#) test site and with assistance from Croatian test engineers of the CTRO. The tests will evaluate and update the CWA 15044 test protocol and complete the data set on baseline CWA 15044 machine performance and survivability characteristics.

Comparative in-country trial of the MV-4 and Bozena-4 mini-flails ([ITEP Project](#), 3.2.41) A comparative trial of the MV-4 and Bozena-4 mini-flails will be carried out by Sweden, with Canada and the United Kingdom, at the [International Mine Action Training Centre](#) (IMATC) in Kenya (Nairobi). The main aim is to evaluate the in-country performance of the mini-flails for deployment in Sudan and to quantitatively assess the effect of hammer wear on the flail performance.

Test and Evaluation Workshop for Mechanical Demining ([ITEP Project](#), 7.2.4)

A Workshop on Test and Evaluation of Mechanical Equipment ([ITEP Project](#), 7.2.4) will be run by the United Kingdom, supported by Sweden, Canada and possibly other ITEP Participants, at the end of the comparative flail

trial. The Workshop objectives are to inform people about the CWA 15044 test procedures, to advice on how they can conduct acceptance testing, and to seek feedback and input from other entities involved in mechanical demining equipment testing.

CEN Workshop (CW 26) on a Test Methodology for Personal Protective Equipment (PPE) for use in Humanitarian Mine Action ([ITEP Project](#), 5.1.2)

This Workshop will involve several ITEP Participants. The responsibility for the workshop will be carried equally by the Swedish Standardisation Institute (SIS) and the GICHD.

Plans exist to update the CWA on T&E of metal detectors ([ITEP Project](#), 2.1.1.1), including recent developments in soil characterization for electromagnetic sensors ([ITEP Project](#), 2.4.1.2).

Additional trials will be run by the individual ITEP members and information will be made available through the ITEP channels. They include APOPO-PARADIS field tests ([ITEP Project](#), 1.2.4), an evaluation of conditioned bees for detecting of buried landmines ([ITEP Project](#), 2.3.2.6), and the test and evaluation of the improved "MINE STALKER" NIITEK Ground Penetrating Radar system ([ITEP Project](#), 2.2.2.3).

Published test reports

The following reports have been published since November 2005.

Reports on 2004-2005 trials

- [Scanjack 3500 System Technical Test Report](#)
- [Operational Evaluation Test of Mine Neutralization Systems](#)
- [Development and construction of a camera system for landmine detection](#)

- [Way Industries Bozena-4 Flail Test and Evaluation](#)
- [Systematic Test and Evaluation of Metal Detectors \(STEMD\). Interim Report Field Trial Mozambique, 12th April - 5th May 2005.](#)
- [Assistance with Magnetic Susceptibility Measurements - Soil Samples from the Archive of the Agropedology Institute, Sarajevo](#)
- [Proof of Performance Test Report on Mine Clearing/Survivable Vehicle](#)
- [Flail Hammer Head Test and Evaluation](#)

Reports on pre-2004 trials

- [Mechanically-Assisted Clearance Equipment Test and Evaluation Program, 2002 - Equipment Evaluation \(Mini-Flail XM2670-A3\)](#)
- [Results of the Humanitarian Demining Sensors Field Test, November 2002](#)
- [Test Results of the Geophex GEM-3, June 2004](#)
- [Summary Report of Testing of the Propellant Torch System](#)
- [Summary Report on the High-Performance Hand-Held Foamed Nitromethane System.](#)

ITEP Contacts

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- *Evaluation of metal detector arrays for humanitarian demining*, [Kevin Russell \(kevin.russell@drdc-rddc.gc.ca\)](#)
- *Handheld Stand-Off Mine Detection System (HSTAMIDS) Operational Field Trails and Demonstrations*, [Lee Offen \(Lee.offen@nvl.army.mil\)](#)
- *MINEHOUND trials*, [David Lewis \(dwlewis@qinetiq.com\)](#)
- *Test and evaluation of available dual sensor trials*, [Christina Muller \(Christina.Mueller@bam.de\)](#)
- *T&E of mechanical demining equipment*, [Geoff Coley \(geoff.coley@drdc-rddc.gc.ca\)](#)
- *Test and Evaluation Workshop for Mechanical Demining*, [David Lewis \(dwlewis@qinetiq.com\)](#)
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- *Testing of conditioned bees*, [Chris Weickert \(Chris.Weickert@drdc-rddc.gc.ca\)](#)
- *MINE STALKER testing*, [Lee Offen \(Lee.offen@nvl.army.mil\)](#)

CEN Workshop Agreements for Test and Evaluation of Humanitarian Demining Equipment

ITEP Secretariat-May 2006

Introduction

In the late 1990's, the lack of demining equipment testing standardization made it difficult to compare test results in order to determine which equipment best suited particular needs. In 2000 the European Commission (EC) mandated the European Standardization Committee (CEN) to establish standard methodologies for testing humanitarian demining equipment. To fulfill this mandate the CEN Technical Committee created the Technical Working Group 126 (CEN BT/WG126) to ensure co-ordination and to generate specific standardization initiatives.

The CEN Workshop Approach

[The CEN Workshop](#) (CEN WS) is a mechanism and approach to standardization. The Workshop concept provides an opportunity for any party faced with a technical challenge to find others in a similar situation and to develop a result by consensus, validated in an open arena.

The procedures for setting up and operating CEN WSs are kept to a minimum and the decision-making powers rest with the Workshop participants. They cover their own costs and are responsible for the direction of the Workshop, as well as for the approval of the deliverables.

The main activity of a CEN Workshop (CEN WS) is the development and publication of the [CEN Workshop Agreement \(CWA\)](#). The CWA is a technical agreement, developed within the framework of CEN and owned by CEN as a publication, which reflects the consensus of identified individuals and organizations that contributed to its contents. The CWA represents a lower level of consensus than that represented by the European Standard. While the latter is binding for participating partners and used as the basis for national standards, the CWA is endorsed and adopted by the interested parties on a voluntary basis. Endorsed and adopted by the interested parties on a voluntarily basis. Published CWAs are publicly available (also on the ITEP website) and can be used free of charge. Relevant CWAs are referenced in International Mine Action Standards (IMAS).

The following CEN WSs have been completed, and the associated CWAs have been published:

- CEN Workshop 07 "Humanitarian Mine Action – Test and Evaluation – Metal Detectors"(CEN Workshop Agreement, Test and Evaluation of Metal Detectors, [CWA 14747, June 2003](#))
- CEN Workshop 12 "Humanitarian Mine Action – Test and Evaluation – Demining Machines" (CEN Workshop Agreement, Test and Evaluation of Demining Machines, [CWA 15044, July 2004](#))

- CEN Workshop 13 “Humanitarian Mine Action –Competency standards” (EOD Competency Standards, [CWA 15464, December 2005](#))

Two of the completed workshops are on test and evaluation of demining equipment. They were strongly supported by the International Test and Evaluation Programme for Humanitarian Demining (ITEP), through active participation of the ITEP Participants’ experts, as well as the hosting of the respective CEN Workshop Secretariats. The CWA 14747 and CWA 15044 have been included in the IMAS on test and evaluation of mine action equipment ([IMAS 03.40](#)) during the July 2005 amendment.

Future CEN Workshop Agreements for Test and Evaluation of Humanitarian Demining Equipment

[CEN WS 26 on a Test Methodology for Personal Protective Equipment \(PPE\) for use in Humanitarian Mine Action \(HMA\)](#) will start in June 2006. Plans also exist to run a CWA’s on characterization of soils for electromagnetic sensors¹, probably as part of the CWA 14747 update.

Depending on the progress of the ongoing dual sensor trials a CEN Workshop may be called to draft a standard protocol to test and evaluate dual sensor mine detectors.

Contact points

The following contact can provide advice on the planning and conduct of an evaluation according to the described CEN WAs. Please contact them if you are considering testing demining equipment or methods.

- ITEP Secretariat, secretariat@itep.ws
- ITEP Working Group on Test and Evaluation of Mechanical Assistance Clearance Equipment, Geoff Coley (geoff.coley@drdc-rddc.gc.ca) or Chris Weickert (Chris.Weickert@drdc-rddc.gc.ca)
- ITEP Working Group on Test and Evaluation of Dual (Multi) Sensors, Ian Dibsall (imdibsall@qinetiq.com) or David Lewis (dwlewis@qinetiq.com)
- GICHD, Al Carruthers (a.carruthers@gichd.ch)
- UNMAS, Noel Mulliner (mulliner@un.org)

Note: A more detailed version of this article is available at the following link:
http://www.itep.ws/pdf/CWA_ITEPweb.pdf.

¹ To obtain more information on the planned CEN Workshop on characterization of soils for electromagnetic sensors, please contact Marc Acheroy (Acheroy@elec.rma.ac.be)

Mine Action Technology Information Resources

The following websites contain information on the latest technical mine action activities and organizations, as well as calendars showing forthcoming technology conferences.

E-Mine

The Official Website of the United Nations Mine Action Service (UNMAS) designed to support both the planning and coordination of global mine action efforts.

<http://www.mineaction.org>

Geneva International Centre for Humanitarian Demining

The Official Website of GICHD that provides regular updates on GICHD activities, studies and projects, including the Equipment Catalogues.

<http://www.gichd.ch>

International Test and Evaluation Programme

Provides information, updates, current test and evaluation reports of demining machines and technologies.

<http://www.itep.ws>

Mine Action Information Center at James Madison University

Contains a good global mine action registry, the Journal of Mine Action, Lessons Learned database, and a Spatial Information Clearing House.

<http://www.maic.jmu.edu>

The International Mine Action Training Centre (IMATC)

The International Mine Action Training Centre (IMATC) is a joint British and Kenyan venture aimed at alleviating the suffering caused by landmines and Explosive Remnants of War by providing high quality Mine Action Training.

<http://www.army.mod.uk/aroundtheworld/ken/imatc/>

UXOInfo.com

Website devoted to information on Unexploded Ordnance (UXO). Latest news on UXO, photo galleries and technology information available.

<http://www.uxoinfo.com>

Canadian Forces National Defense Mine/Countermine Information Center

The NDMIC provides mine and countermine information for Canadian Forces in international operations.

<http://ndmic-cidnm.forces.gc.ca>

US Humanitarian Demining R & D Programme

This site provides an overview of the optional products and technologies that are available for use in global humanitarian demining and developed, or being developed, tested, and evaluated under the U.S. Department of Defense (DoD) Humanitarian Demining Research and Development Program.

<http://www.humanitarian-demining.org/demining/default.asp>

ORDATA Online

ORDATA Online supports the U.S. Department of Defense by providing information to facilitate international UXO training, awareness and clearance operations.

<http://www.maic.jmu.edu/ordata>

Mine Information and Training Centre (MITC)

Sponsored by the Battlefield Engineering Wing at Minley in Surrey, UK, MITC provides a gateway that facilitates the flow of information between military and civilian organisations.

<http://www.army.mod.uk/royalengineers/org/mitc/index.htm>

Nordic Demining Research Forum (NDRF)

Aims to stimulate research and development activities to support improvement in demining efficiency and safety through promotion of co-operation between the operator, research and development, and industrial environments; stimulation of information exchange; and initiation of cross border and cross sector research and development activities between companies and institutions in the Nordic countries.

<http://www.ndrf.dk/>

International Campaign to Ban Landmines

Provides information on the Ottawa Treaty, as well as general information on landmines, campaigns and calendar information on mine action activities.

<http://www.icbl.org>

Sound Bites

The following section contains snippets of information for general interest. They are collected from different communications in the course of the working day. They are offered for what they are worth but the accuracy of the information cannot be guaranteed. If you, too, have short interesting bits of information just send them to the Editors and we will pass them on, submit to the lessons learnt database or discard as appropriate!

GICHD Mechanical Demining Equipment

Catalogue: The fifth edition of the *Mechanical Demining Equipment Catalogue* has been recently published by the GICHD. The aim of the Catalogue is to inform the field-based mine clearance community about the choice of machines currently or potentially available on the international market. The Catalogue's succinct presentation of available equipment seeks to help the field user to choose the appropriate machine for a given task in a particular environment. Included are an indication of the costs involved and the level of manufacturer logistical support that a programme could expect to receive for each particular machine. Contact details of machine producers are also provided. *For more information please visit the website at: <http://www.gichd.ch/898.0.html>.*

Guide to International Mine Action Standards (IMAS):

The IMAS are standards issued by the United Nations to guide the planning, implementation and management of mine action programmes. They have been developed to improve safety and efficiency in mine action.

As the IMAS can sometimes be complex, this handbook, issued by GICHD in April 2006, is intended to explain the purpose of the IMAS and what each of the different standards says. *For more information please visit the website at: <http://www.gichd.ch/898.0.html>.*

Guidebook on Detection Technologies and Systems for Humanitarian Demining:

The *Guidebook on Detection Technologies and*

Systems for Humanitarian Demining is a new GICHD publication and is a compilation of known technologies that could be applied to the detection of mines and minefields. It covers a wide spectrum of technologies from the common metal detector through to airborne detection systems.

The Guidebook is written in such a way that it will provide information of a technical nature to a wide readership. An electronic version of the Guidebook are available at <http://www.gichd.ch/898.0.html> and printed copies will be available shortly from the same site.

ITEP Work Plan feedback:

The ITEP Work Plan for 2006 is well underway and available on the ITEP website (<http://www.itep.ws>). ITEP undertakes test and evaluation projects in support of the needs from the field. Without feedback from the field on what they should be doing, and whether they are doing the right thing, they may be wasting time and energy or even duplicating other efforts. ITEP will improve the summary presentation of their published reports and will respond to requests if at all possible. So, please visit their website and send comments and suggestions to the ITEP Secretariat secretariat@itep.ws or one of the Newsletter Editors.

Explosive Harvesting Project –Cambodia:

Golden West Humanitarian Foundation have developed something novel in the way of

recycling explosive from excess ordnance that may be available in mine affected countries. The Explosive Harvesting Project is working with funding and assistance from the US Department of Defence Humanitarian R&D Program and the Secretary of State to develop and refine the equipment and processes. They have reportedly made some excellent progress and we hope to have a

feature article in the next issue of the *Technology Newsletter* and explain the project for the numerous countries that have difficulty obtaining explosives for neutralization charges.

Ideas needed:



There is a peculiar problem in Cyprus for which a solution is sought to avoid excessive digging and protective works. Some AT mines buried in minefields have anti lift devices attached to the bottom. It is not possible to blow in situ without extensive sandbag protection which all takes time to provide. What is needed is a way or device to see through the mine to see if it is booby trapped below. An x-ray machine with no need for a back plate would work but does such a thing exist? At the moment an SOP is used to dig a small tunnel below the mine but are there any other ways to "see" the booby trap? *Suggestions to one of the Editors please.*

Moonbuggy. News of a remote controlled EOD vehicle was broadcast among EOD specialists recently. Details of the vehicle can be seen at www.moonbuggy.com. It appears that the vehicle is quite versatile and could have a variety of uses in the field. Looking for a gift for the Director or Programme Manager? - Or perhaps the Operations Officer should see it first.