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CEN Workshop Agreements for Test and Evaluation of Humanitarian Demining Equipment

The Comité Européen de Normalisation has organised workshops to aid the establishment of standard methodologies for demining. This article discusses the workshops and the agreements reached in those workshops. The author includes a list of contacts for additional information on demining equipment and methods.

by Franciska Borry [International Test and Evaluation Program for Humanitarian Demining Secretariat]

The increase of humanitarian-demining activities in the late 1990s awakened the need for a standardised assessment of the equipment used in these activities. Although trials of the capabilities of available demining equipment were already taking place, the lack of testing standardisation made it difficult to compare test results to determine which equipment was best suited to any particular need. Therefore, test results were frequently of limited use to the end-user community. It was within this context that the European Commission mandated in 2000 that the Comité Européen de Normalisation establish standard methodologies for humanitarian demining. In order to fulfil this mandate, the CEN Technical Committee created Technical Working Group 126 (CEN BT/WG126) to ensure coordination and generate specific standardisation initiatives.

The CEN Workshop Approach

CEN has introduced the CEN Workshop, a mechanism and approach to standardisation. It is intended to be a process in which clients can bring their standardisation and technical specification requirements and have the opportunity to find a solution in an environment "tailor made" for their needs. The workshop concept provides an opportunity for any party faced with a technical challenge to find others in a similar situation and develop a result by consensus, validated in an open arena.

The procedures for setting up and operating CEN Workshops are deliberately kept to a minimum and all the decision-making powers rest with the interested parties themselves (i.e., the workshop participants). They cover their costs and are responsible for

the direction of the workshop as well as the approval of the deliverables.

The main activity of a CEN Workshop is the development and publication of the CEN Workshop Agreement. The CWA is a technical agreement endorsed and adopted by interested parties on a voluntary basis. Published CWAs are publicly available on the International Test and Evaluation Program for Humanitarian Demining Web site,¹ among others, and can be used free of charge. They are promulgated in the International Mine Action Standards after consideration by the IMAS Review Board.

Since the creation of the CEN BT/WG 126, the following CEN Workshops have been completed and the associated CWAs published:

- CEN Workshop 7: "Humanitarian Mine Action—Test and Evaluation—Metal Detectors"²
- CEN Workshop 12: "Humanitarian Mine Action—Test and Evaluation—Demining Machines"³
- CEN Workshop 13: "Humanitarian Mine Action—Competency Standards"⁴

Two of the completed workshops were on the test and evaluation of demining equipment. They were strongly supported by the International Test and Evaluation Program for Humanitarian Demining through active participation of the ITEP participants' experts, as well as the hosting of the respective CEN Workshop Secretariats. These two testing standards are discussed in more detail below. As the CWA 15464, "EOD Competency Standards," is not of direct interest to the test and evaluation community, it is not discussed further in this article.

CWA 14747, "Test and Evaluation of Metal Detectors," and CWA 15044, "Test and Evaluation of



Mechanical demining equipment tested according to the CWA 15464. ALL PHOTOS COURTESY OF C. LEACH, QINETIQ, F. BORRY

Demining Machines," have been included in the IMAS on test and evaluation of mine-action equipment⁵ during the July 2005 amendment.

During 2006 the following new CEN Workshops started:

- CEN Workshop 26—Humanitarian Mine Action—Personal Protective Equipment—Test and Evaluation
- CEN Workshop 7 (reactivated)—Humanitarian Mine Action—Test and Evaluation—Metal Detectors—Part 2: Soil Characterisation for Metal Detector and Ground Penetrating Radar Performance

Both Workshops will publish final CEN Workshop Agreements by the end of 2007.

Published CWAs for Test and Evaluation of Humanitarian Demining Equipment

CWA, Test and Evaluation of Metal Detectors (CWA 14747, June 2003). CWA 14747 provides guidelines, principles and procedures for test and evaluation of metal detectors. As far as possible, procedures for testing have been closely specified. The agreement applies to all handheld metal detectors for use in humanitarian demining and is intended to be used for commercial off-the-shelf detectors, but many of the tests specified could be applied to detectors under development.

It should be noted that few users of the document will wish to or be able to perform all of the tests specified. Different parts of the CWA are intended to be used by research and development laboratories, manufacturers and organisations needing to procure metal detec-

tors, mine-action centres and metal-detector users in the field. A user in the field, for example, may perform the detection reliability test, some of the tests of operational performance characteristics and some of the basic in-air and in-soil sensitivity measurements. Furthermore, users of the CWA who wish to conduct a trial of various metal detectors using the tests specified may also conduct a pre-trial assessment to exclude detectors that clearly do not meet their requirements from the start. Such a pre-trial would include one or more of the tests specified in the CWA, with acceptance levels set by the users according to their own requirements.

In order to help different users get the maximum benefit from the CWA, guidelines are provided under the form of a matrix⁶ as to which CWA tests are considered appropriate for different categories of trials.

At the time of the publication of CWA 14747 (June 2003), it was stated that further work was needed on the understanding of the effect of the soil and how to best characterise it, as well as on the design of a practical approach to measure detection reliability. In the meantime, the CWA 14747 test protocols have been verified during several trials, among others, the comparative trial of commercial, off-the-shelf metal detectors.⁷ A list of CWA 14747 updates is now being proposed and plans exist to reconvene CEN Workshop 7 in 2007. The main objective of the reconvened Workshop 7 will be to produce an addition to the CWA 14747 that incorporates new scientific knowledge on testing procedures and provides user guidance on key performance tests for field users as well as for laboratory testing.⁸

CWA, Test and Evaluation of Demining Machines (CWA 15044, July 2004). The aim of CWA 15044 was to create industry-accepted criteria for the testing, evaluation and acceptance of COTS mechanical equipment used in humanitarian demining. Among other things, it should help users find the key technique or combination of techniques best suited to a given mine-clearance operation.

In CWA 15044, demining machines are defined as those machines whose stated purpose is the detonation, destruction or removal of landmines. It should be noted this does not necessarily imply a fully demined area following passage of the machine. The machine could be a ground-preparation machine, primarily intended to improve the efficiency of subsequent demining activities.

CWA 15044 provides a standardised methodology for test and evaluation of demining machines using a systematic and stepwise approach. It includes provisions and technical criteria for:

- Performance testing: Testing to establish whether the machine and its tool(s) are capable of performing the role for which they are intended under comparable and repeatable conditions, and to evaluate the manufacturer's specifications.
- Survivability testing: Testing of the explosive forces on the machine and operators. The explosive force used is based on the level of threat against which the machine is designed.
- Acceptance testing: Testing to ensure the machine is able to work in the environment in which it is intended to be used. The criteria provide guidelines for local authorities when accrediting machines.
- Test targets: The criteria provide testing agencies with guidelines to develop standardised test targets.

CWA 15044 also provides a list of all information that should be provided by the manufacturer before testing. It further recommends a pre-trial assessment, but does not include specific guidelines. This assessment is a qualitative examination of the equipment looking at the different functions, suitability, basic operating parameters, capabilities and manufacturer specifications and should answer the question: "Is it suitable for continued testing?" The ITEP testing community recommends a pre-trial assessment for all demining equipment considered for testing prior to embarking on a full-scale trial.

It is acknowledged that the current version of CWA 15044 is written with an apparent bias toward flails and similar machines; however, it is noted that other machines including rollers could be tested equally well using the same procedures. In addition, machines intended to remove mines (versus triggering or breaking them), such as sifters, could be tested simply by modifying the proposed test sheets.

At the time CWA 15044 was published (July 2004), it was recognized that the CWA concentrates on the testing of machines to clear mines and there is a need



STEMD metal detectors tested according to the CWA 14747.

to expand future work to address a number of issues, including appropriate testing of ground-preparation devices and vegetation cutters, enhancement of operator/crew safety testing, enhancement of mobility testing and performance-degradation testing.

A series of mechanical equipment trials executed by ITEP during 2006 using the CWA 15044 test protocol has further produced some useful experiences which will be taken into account when the CWA 15044 is updated, probably in 2008.

Ongoing CWAs for test and evaluation of humanitarian-demining equipment. A CEN Workshop (CEN WS 26) on a Test Methodology for Personal Protective Equipment for use in humanitarian mine action kicked off in June 2006.

The Standardisering i Sverige (SIS) and the Geneva International Centre for Humanitarian Demining are co-chairing this CEN Workshop. The aim is to establish

recognised and clearly defined specifications for vital criteria to be tested and appropriate testing methodologies for PPE for deminers. An open invitation was launched to those with an interest in the test and evaluation of PPE to participate in the Workshop. Two technical CEN Workshop meetings were held during 2006 and a third one was held on 13–14 March 2007.⁹

A CEN Workshop (CEN WS 7/Part Two) on Soil Characterisation for Metal Detector and GPR Performance Evaluation started in November 2006. The Workshop will produce a second part for the CEN Workshop Agreement for Test and Evaluation of Metal Detectors (CWA 14747,¹⁰ part 2) with the following objectives:

- Establish the state-of-the-art effect of soil properties on MD, GPR and dual-sensor detectors combining MD and GPR.
- Create quantitative characterisation of soil properties relevant to MD and GPR performance.
- Provide a methodology for measuring the selected soil properties.
- Create a classification of soils for controlled conditions to help estimate the degree to which the soil properties affect detectors.
- Provide a soil measuring and classification system that is easy to apply in the field.

Four Working Groups, each tasked with drafting different parts of the document, were established at the kick-off meeting. The first technical meeting was held 3 May 2007.¹¹

Points of Contact

The contacts listed below are available to provide advice on the planning and conduct of an evaluation according to the described CEN Workshop Agreements. Please do not hesitate to contact them when



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considering a trial of demining equipment or demining 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: David Lewis, dwlewis@qinetiq.com
- GICHD: Erik Tollefsen, e.tollefsen@gichd.ch
- United Nations Mine Action Service: Noel Mulliner, mulliner@un.org ♦

See Endnotes, Page

News Brief

Burmese Separatist Group Signs Statement Against Landmines

The National Democratic Front of Burma signed a statement against landmine use at its January 2007 Central Executive Committee meeting. The statement directs various member organizations, which claimed landmines were an effective self-defense tactic, to find ways to minimize mine use.

The NDF also directed members to apply strict usage rules, regulate/supervise mine activity and ensure villagers in NDF areas are not harmed by the use of landmines. Formed in 1976, the NDF is an umbrella organization for armed opposition groups of Burma/Myanmar's various ethnic nationalities. More than 2,000 people are estimated to be members of the National Democratic Front.