

Systematic Test & Evaluation of Metal Detectors

Noel Mulliner
UNMAS

Phil Bean
GICHD

Francois Littmann
European Commission
Joint Research Centre

1. Background

Up to date and accurate information on available technology is urgently needed to help Mine Action Centres and donors in the planning of demining activities and in the selection of the best-suited type of demining equipment. Metal detectors are widely commercially available and are still the main tool used by deminers for manual demining activities. The International Pilot Project for Technology Co-operation (IPPTC) performed a large-scale metal detector trial, producing a "consumer report" for users [3]. IPPTC established many principles for metal detector testing and identified the need for standardized tests to be agreed internationally. The United Nations Mine Action Service (UNMAS) has performed tests of metal detectors in the past, in order to assess their suitability for specific regions like Afghanistan [1] for example. The Geneva International Centre for Humanitarian Demining (GICHD) publishes a catalogue on metal detectors annually [2], but data is mainly provided by the manufacturers without being independently assessed. A CEN Workshop Agreement has been internationally reached on the test & evaluation of metal detectors, published in July under the following reference CWA14747:2003 [4].

It is now the time to run a systematic test campaign in order to assess the capabilities of the different available metal detectors. Such a project, funded by the European Commission, has just been launched to measure the performance and weaknesses of metal detectors, using the agreed standard test procedures.

2. Objectives

The first objective is to enable mine action programme managers to make informed choices over metal detector selection. The second objective is to publicize the CEN Workshop Agreement (CWA) and to achieve good understanding by metal-detector users of the advantages of standardized testing and the ideas that the CWA introduces. In particular we need to encourage those that may test metal detectors to use the tests specified in the CWA. Thirdly, it is important to stimulate users of metal detectors to provide feedback on the CWA and to suggest improvements for a future issue of the CEN Workshop Agreement. The fourth objective is the publication of independent and objective test results that can be used to update future issues of the GICHD metal detector catalogue.

3. Test campaigns

The best way for publicizing the CWA and to collect feedback is to run trials using the CWA protocols and involving metal detector users at the different national mine action centres as well as those employed by Non Governmental Organizations (NGOs) and commercial companies. The European Commission Joint Research Centre (JRC) plans to organize test & evaluation campaigns following a two-stage approach:

- First stage: Under laboratory conditions, using the JRC facilities in Ispra, run tests on a wide range of metal detectors using the CWA protocols. We will run test campaigns together with other international partners in order to assess the capabilities of off-the-shelf new detectors. In particular, we will monitor:
 - The immunity & performance under environmental stresses (vibration, temperature, moisture & electromagnetic compatibility).
 - The logistics & ergonomics aspects (dimensions, weight (balance, moment of inertia), battery life, set-up, alarms, transport case, etc.).
 - The detection capability with specific soils and mines.
- Second stage: The JRC will facilitate in-field tests in several mine-affected regions (example South East Europe, Southern Africa, etc.), under realistic conditions using the CWA protocol, and the same metal detectors as during the first stage as well as metal detectors already in use in each region. This opportunity will be used to collect environmental data influencing the suitability of metal detectors (characteristics of soils & mines, temperatures, vibrations, etc.). Personnel of local Mine Action

Centres (MACs) and locally-active demining NGOs will be invited to follow the tests. User feedback will be collected for submission to CEN Workshop 7, in order to produce an updated version of the CWA.

4. Partnership

The core partners of the proposed project will be UNMAS, the GICHD, the JRC and regional mine action centres, etc. All members of the International Test & Evaluation Program (ITEP) will be invited to participate actively in the tests. Furthermore, the experts already involved in contributing to the process of the CWA will be invited to participate.

The results of tests will be used to update the metal detector catalogue produced by the GICHD under mandate to the United Nations.

5. References

1. Metal Detector Trial UN Mine Action Programme Afghanistan – February/March 2002 (www.itep.ws/pdf/Summary_Detector_trial_report_afghanistan_w_annex_1.pdf).
2. Metal Detectors Catalogue 2003, GICHD, February 2003, ISBN 2-88487-009-1 (http://www.gichd.ch/publications/Metal_Detectors_Catalogue_2003_index.htm).
3. International Pilot Project for Technology Co-operation Final Report; A multi-national technical evaluation of performance of commercial off the shelf metal detectors in the context of humanitarian demining; Editors Y. Das (CA), J.T. Dean (EC), D. Lewis (UK), J.H.J. Roosenboom (NL), G. Zahaczewsky (US), EUR 19719 EN – 2001 (<http://demining.jrc.it/ipptc>).
4. CEN Workshop Agreement: Humanitarian Mine Action – Test and Evaluation – Metal Detectors (CWA 14747:2003), June 2003 (<http://humanitarian-security.jrc.it/demining/cw07/index.htm>).