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Systematic Test & Evaluation of Metal Detectors: Interim Report Field Trials Mozambique

Dieter Guelle
Adam Lewis

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natural quality assurance stamp of approval, verifying that all the mines had been removed.

**Status of the Field**

According to Ilan Talavisi, during the pre-project survey he found that the field had become a site for the disposal of building debris left on the boundaries of the minefield (creating a pile of more than 50,000 cubic meters (65,398 cubic yards)). This obstacle made the clearance project more difficult since the debris spilled over onto the land to be cleared, and the pile had to be removed before clearance could begin.

The minefield contained a combination of M-3 Belgian anti-personnel mines3 and some Jordanian AP mines3. In the late 1980s and 1990s, the IDF removed some of the mines to minimize risk, but there was no certainty regarding the extent of the mines left. To make things more complex, over the years the residents encroached on the minefield boundaries to a point that some of the houses were built bordering the field. The presence of these houses made searching mines on-site much more difficult and called for a gentler and more accurate clearance process.

**Clearing the Field**

Demining companies in Israel must be approved by the Ministry of Defense and the IDF to assure compliance with quality-control standard operating procedures. Maavarim Civil Engineering has years of experience in contracting with the MoD for mine clearance and explosive ordnance disposal projects, and was chosen to conduct the mine clearance and to prepare the field for construction of the school. Because this project was under taken on behalf of the villagers, a special Maavarim liaison officer was appointed to keep the villagers informed during all stages of the project and to address any complaints that arose.

Maavarim’s standard operating procedures, based on the International Mine Action Standards, led the planning and execution of the work on the Tize Baher project from start to finish. The work on this site was a combination of a few methods. Although the survey and analysis of the field showed no evidence of anti-tank mines, to identify and dismiss the presence of this type of mine, Maavarim personnel marked the boundaries of the field and conducted manual demining using metal detectors.

Next, mechanical demining removed the land to a depth of 0.5 meter (1.6 feet) to the bedrock. In the last stage, Maavarim used specially trained mine-detection dogs to verify that all mines had been removed. The Israeli Army provided supervision and final approval for the clearance of the field, accepting Maavarim’s recommendation to approach this project according to IMAS, even though the IDF does not normally work according to IMAS.

**Conclusion**

The work on the site started in early September 2005 and was complete by the end of October. Construction will be completed by May 2007. The Tize Baher project is an example of how mine clearance can influence the daily life of an entire village. From experience working with the demining industry in Israel, it is evident that government and private funds are rarely spent on this type of activity unless commercial interests are involved.

This project is unique because this is the first time the Israeli Supreme Court has stated that the government is responsible for clearing a minefield that was not left by its army. Additionally, the Ministry of Justice set a new precedent involving the areas of responsibility of each body involved in civil and humanitarian mine clearance. The decision to force the Jerusalem municipal ity to fund mine clearance and to force the army to then employ professionally responsible for landmines it did not emplace is a model for mine-clearance activity in Israel—a model that hopefully will lead the way to clearing more minefields.

This article was written with assistance from the project manager, Mr. Ilan Talavisi of Maavarim Civil Engineering Ltd. See Evaluations, page 112

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**Systematic Test & Evaluation of Metal Detectors: Interim Report Field Trials Mozambique**

The Joint Research Centre of the European Commission published at the end of 2005 another interim report for the STEMD project. This article gives background on the project and report and some results and recommendations of the trial. The authors hope this article will pique interest in the full report.

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The concept of the Systematic Test & Evaluation of Metal Detectors project is to conduct tests relevant to specific and UXO problems in different regions of the world. STEMD can be regarded as a trial making use of the experience distilled into the Centre European Normalisation Workshop Agreement (CWA) about testing of metal-detectors and giving an overview of the state-of-the-art of the current metal-detector fleet. The project consists of laboratory tests, field trials and training of interested parties in testing methods. Lab tests are being carried out in the laboratories of the JRC–Ispra. A trial in southern Africa was planned from the outset. Mozambique was favoured because of previous experience and because of the existence of a dedicated training site with different types of soils and the availability of local test targets. The report describes the second field trial of the STEMD project. Some basic information from the STEMD Interim Report Field Trial Report is repeated so the present report may be understood independently.

The purpose of the trials in Mozambique was to:

- Assess commercial-off-the-shelf detectors believed to be appropriate to Mozambique and for humanitarian demining generally
- Make the data available for the humanitarian-demining community

Objectives of the trials were to:

- Compare performance of detectors in different types of Mozambican soils
- Measure sensitivity of detectors to typical local targets of interest and standard targets
- Train local staff in the CWA
- Collect site information for International Test and Evaluation Program for Humanitarian Demining

The report gives an overview about the preparation and describes in detail the methodology and procedures used to achieve comparable results. The technical details of the detectors described in the report are divided into two categories: technical information that is relevant to users and that which is relevant to technical personnel. A full chapter explains the main factor influencing metal-detector performance—the ground. A simple method to measure and gain knowledge about the magnetic soil properties is explained.

In the trial, we were able to take advantage of seven prepared lanes used for training purposes by the Accelerated Demining Program. Lane 1 contained bunkers‘ sand from a sandpit. Lanes 2–6 contained five different soil types from the zone around Moamba. Lane 7 contained soil from Namaacha, adjacent to the Swaziland border. With these seven lanes and increasing detection difficulties from one lane to the other, the results reflected the influence of soil on the detection abilities of the current metal-detector fleet. The detectors being tested included the 12 latest models from the following manufacturers:

- CEAS S.P.A.
- Ethgen GmbH
- Guartel Ltd.
- Institute Dr. Foerster GmbH and Co. KG
- Minsat Pty Ltd.
- Schoch Elektronische Geräte GmbH
- Shanghai Research Institute of Mineawre Technology
- Villon GmbH

The results of the trial are laid out in two chapters of the report. One describes the direct comparison of all detectors versus the 13 targets and the seven soil types, and the other is an individual assessment of each detector. For senority comparison in air, the detectors were...
Mine Action Support Group Update

The following article highlights the recent activities of the Mine Action Support Group from the first quarterly U.N. newsletter of 2006, including updates on the United Nations Mine Action Service, the United Nations Development Programme and UNICEF.

excepted by Stacy Davis [U.S. Department of State]

Eritrea. Demining operations as part of the United Nations Mission in Ethiopia and Eritrea have gone through extensive changes in the first part of 2006. Due to governmental limitations on the use of helicopters for medical evacuations in Eritrean areas, most of the demining operations have moved closer to the Ethiopian border. Clearance operations are still ongoing in the Temporary Security Zone, including road clearance and UXO clearance. The UNMEE Mine Action Coordination Center is now focusing on planning mine-action support to the demarcation of the Eritrean/Ethiopian border. This support will use mechanical, manual and mine-dog capacities to ensure effective clearance of the border.

UNDP. Chad. Although funding for demining is low in Chad, several mine-action groups in the country are active. Key achievements include:

- Mines Advisory Group resumed operations from mid-January until the end of February 2006.
- Following a visit, the U.S. Department of State decided on 22 March 2006 to increase the funding for the MAG project (March 2006–February 2007), increasing the explosive ordnance disposal teams from one to three and allocating a budget of US$2.2 million.
- The government of Switzerland is providing a Technical Advisor to the Information Management System for Mine Action database for six months beginning 1 May 2006.
- The National Demining Office participated in a meeting with a representative of the World Bank in order to study the possibility for the Bank to finance the national mine-action program with oil revenues.
- Key challenges for the short term:
  - On 22 March 2006, following an incident at the High Command for National Demining compound, the HCND staff was arrested and an interim coordinator was designated. All efforts aimed at strengthening the capacities of the HCND have suffered from this situation.
  - In 2006, a technical assistance project that was about to be launched with funds of the MAG project received US$100,000 from the Chadian government and an additional US$100,000 from UNDP Chad. This amount of money is not sufficient to resume mine-clearance activities, which stopped in mid-December 2005. At least US$1 million is needed to cover the cost of operations for six months. Engaging the government and other external donors for the implementation of the National Mine Action Plan for 2006 remains the first key objective for the short term.

T he MAG is an informal forum of 26 members that meets quarterly to exchange information between donors and the U.N. Secretariat on mine-action activities and research. Representatives from mine-affected countries, nongovernmental organizations and experts are invited to report on the status of mine action in their countries. The MAG also works to achieve greater donor coordination and facilitate funding. The United States was unanimously deemed to chair the committee in December 2005 and will continue to do so until 2007.

UNMAS. On 20 April 2006, the Inter-Agency Coordination Group on Mine Action adopted the United Nations’ Inter-Agency Mine Action Strategy 2006–2010. The Strategy complements the inter-agency policy on mine action and effective coordination that IAGC–MAG principals adopted in June 2005. It also reflects lessons learned over the course of the implementation of the United Nations’ Mine Action Strategy 2001–2005. Above all, the new strategy is results-based—its strategic goal and four strategic objectives focus on the impact, or the anticipated outcome, of U.N. mine action by 2010. The previous Strategy listed some 48 activities as “strategic objectives.” These were approved by the departmental and agency focal points but did not assist in the organization of priorities and measurement of results. The content of the new Strategy is a significant improvement.

The text provides a situational analysis describing the assumptions, risks and challenges defining the context within which the United Nations’ mine action goals and objectives can be achieved by 2010. The United Nations will work in partnership with others, in light of its own mandates, advantages and resources, in a mindful of the responsibilities borne by other key actors in the mine-action sector.

The new Strategy reaffirms the United Nations’ express commitment to supporting and adhering to and compliance with the normative framework of international humanitarian law and the United Nations’ commitment to continuous, transparent monitoring of periodic and progress, reporting on implementation to the General Assembly.

U.N. Mission in the Democratic Republic of the Congo. During the first quarter of 2006, the Vietnam Veterans of America Foundation and the Mines Advisory Group resumed their Emergency Impact Survey activities, starting with the area of Gadailha in the Equateur province. Following its survey in 2005 of the northern Katanga district, DanChurchAid is now conducting mine/explosive remnants of war clearance operations within the priority areas identified by the survey. Part of these activities are funded through the end of the year, but more remains to be done and additional resources are required for increasing the capacities, particularly for surveys.

News Brief

Colombian Police Train Mine-sniffing Rats

With the highest number of landmine-related deaths and injuries in recent years, Colombia has a very strong interest in seeking cost-effective demining methods. Consequently, the government recently trained six rats to locate explosive devises, which are often deployed by rebel forces and drug dealers.

Recent interest in training rats arose not simply because the animal has an uncanny aptitude for the task, but also because training mine-detecting dogs is very costly and time-consuming. Dog handlers are often injured if their canines set off an explosive device nearby. Unlike their heavier counterparts, rats to locate explosive devices, which are often deployed by rebel forces and drug dealers.

Colombia has the result of decades of conflict between government forces and guerrillas protecting lucrative coca fields, which provide much of the world’s cocaine supply. The irregularly replaced minefields are designed to keep Colombian and international forces from eradicating or disrupting the production of coca.

Mines in Colombia are the result of decades of conflict between government forces and guerrillas protecting lucrative coca fields, which provide much of the world’s cocaine supply. The irregularly replaced minefields are designed to keep Colombian and international forces from eradicating or disrupting the production of coca.

• The sensitivity loss from L1 to L7 for the detectors without ground compensation was so large that some targets that could be comfortably detected to the required depth of 130 mm in L1 could not be detected even much nearer to the surface in the higher numbered lanes.
• For detectors with very substantial sensitivity loss from L1 to L7, it is important that users are aware of the ground conditions and check the reliability of the detector’s ability to sense the exposed mines in the working area.
• In general, in air maximum detection height, measured with the detector set up for a particular type of ground, are not equal to the in-soil maximum detection depth in the same ground.
• Minimum-metal mines are still the main detection problem. Even the detectors with good soil compensation could not distinguish small targets to the required depth in all lanes.
• Ground magnetic properties (magnetic susceptibility, ground reference height) should be measured and recorded as a survey task because they have to be known for planning and proper use of the detector fleets.
• For the execution of the trial, we received excellent support from the Mexican National Demining Institute in the Accelerated Demining Programs and other national organizations. Note: There are a very limited number of hard copies of the report available for people who have limited access to the Internet. If you do not have access to the Internet, please contact Adam Lewis to obtain a printed copy.

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http://community.chicagounion.edu/journal/index.php/mine-action/2006-08-10-1

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